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(December 2022)



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Special Issue Review Policy

Each manuscript was first reviewed by the editorial board in terms of its subject, and plagiarism. The study, which received editorial approval, was sent to three reviewers. These reviewers are academicians who are not AIOR members and do not work at universities in Turkey. Our publications implement a blind-peer review process that does not enclose reviewers to manuscripts. The names of these reviewers, who have academic expertise in their field and non-Turkish, were kept confidential in terms of publishing policy and academic ethics. However, the reviewers' evaluations were shared with the researchers.

Investigation of Turkish Elementary School Students' Environmental Awareness

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Abstract

This study aimed to examine the environmental awareness of Turkish primary school students in the context of some demographic variables. The study was carried out with the general survey method. An online questionnaire was used as a data collection tool due to the Covid 19 pandemic conditions during the study. The first part of this survey form included demographic questions about gender, grade, household income, mother's graduation, and father's graduation. The second part included the 5-Likert type 21-item Elementary School Environment Awareness Scale (ESEAS). The original ESAS developed by Yıldız Yılmaz and Mentiş Taş (2017) consists of 31 items. As a result of a pilot study, it was decided to exclude 14 items from the original scale. The exploratory factor analysis result revealed that the scale showed a structure with five sub-dimensions (ecocentric, nature responsibility, anthropocentric, environmental knowledge, and hedonistic). Two hundred sixty primary school students at the 2nd and 4th-grade levels participated in the study. The present study's results, which examined elementary school students' environmental awareness levels, showed that the null hypothesis was accepted in most scores related to scale factors. These results show that the students who participated in the study tended to have information about the environment and the factors that threatened the environment, to be sensitive to nature, and to be ready to sacrifice to solve environmental problems. The analysis results show that the participants agreed with the statements in ecocentric, nature responsibility, ecological knowledge, and hedonistic sub-dimensions. At the same time, they disagreed with the views of the anthropocentric sub-dimension. It was determined that there was a significant difference between the groups in the context of some demographic variables.

Keywords: Turkish Elementary School Students, Environmental Awareness, Elementary School Environment Awareness Scale (ESAS)

1. Introduction

There is a two-way relationship between humans and the natural environment. While humans affect the natural environment, the natural environment also affects human life. Since the human population was low in the past, the negative impact of human intervention on nature for food and energy sources was relatively low. Over time, with the increase in human population and the change in people's consumption habits, natural resources began to decrease and even disappear (Nyika, & Mwema, 2021; Tekiroğlu, & Hayır Kanat, 2021). The deterioration of ecological balance threatens human life and the existence of natural plants and animals (Kurt Gökçeli, Tarkoçin,

& Bilmes, 2021). Although many solutions are offered for various environmental problems that have occurred over time, it is crucial to take measures to prevent them before they occur (Şimşekli, 2004). One of the most critical factors in achieving sustainable development is education. Education is the crucial point that provides the evolution of humans' awareness of the environment and environmental problems and the development of the consciousness, attitudes, and skills they should have to solve environmental problems (Chapman, & Sharma, 2001). For this reason, any training or activity in the field of environmental education emerges as an alternative way to solve the environmental problems that occur (Onion, Wongchantra, & Bunnaen, 2021). Thanks to the development of environmental awareness through education, people will find solutions to live in a safer and healthier environment. According to the Turkish Language Association, awareness is awareness of an event, phenomenon, or situation (TDK, 2022). Although awareness is explained as perceiving the relationship between individuals and the outer world, this relationship can be defined not through verbal or mental perception but as visual perception and perception of the beings in the environment (Yeşilyurt, Özdemir Balakoğlu, & Erol, 2020). The environment is where individuals are in close or distant relationships and constantly interact. Environmental awareness is defined as knowing the environment and the factors that threaten the environment, being sensitive to the environment, and being ready to make sacrifices to solve environmental problems (Grodzińska-Jurczak, Stepska, Nieszporek, & Bryda, 2006). Ecological awareness is humans' general knowledge and consciousness against positive and negative changes in their immediate or distant environment (Gadenne, Kennedy, & McKeiver, 2009). Raising environmentally friendly generations is a critical issue (Çetin, & Nişancı, 2010). The environment in which individuals are born affects their behaviors, attitudes, and cultural development in all areas of their lives (Vatansever Bayraktar, & Fırat, 2020). In particular, the experiences and knowledge gained from children's family environment in the early stages of their lives affect their behavior in their later years. Therefore, the importance of both formal and informal environmental education emerges at an early age.

Environmental education is one of the most critical issues for protecting, improving, and sustaining the natural environment (Suarlin, & Ali, 2020). Environmental education is a rapidly developing and dynamic subject that gives people a different perspective on nature and provides information about the duties and responsibilities of people in protecting living beings in nature (Puri, Vel, Manoharan, James, & Joshi, 2021). In this context, environmental education could contribute to developing ecological awareness, skills, and positive attitudes in individuals of all ages, starting from preschool education.

The search for solutions to gradually increasing global environmental problems has necessitated some initiatives at the international level. In this context, the decisions taken at the Tbilisi Conference held in 1977 in cooperation with UNESCO and the United Nations Environment Program are essential. The Tbilisi Declaration emphasized the importance of education in protecting and improving the environment. According to this declaration, environmental education objectives were determined as environmental awareness, environmental knowledge, attitude, skills, and participation. Environmental education aims to raise awareness and consciousness about the environment in both urban and rural areas, provide each individual with the knowledge, attitudes, and skills they need to protect and improve the environment and contribute to society's positive behaviors towards the environment (URL 1).

The findings of academic studies on environmental education are essential sources of information for those who develop education policies and curricula. Every day, new studies are carried out on society's and students' environmental education at different levels (Mutisya, & Barker, 2011). Stanišić and Maksić (2014) examined the curricula of the same countries and at various educational levels. The researchers reported that environmental issues in the programs they studied were mainly theoretical, while practical activities were missing or absent. It is understood that the Ministry of National Education (MEB) of Türkiye emphasized including environmental education in the 2002 and 2006 preschool curricula. At the primary school level, there were topics related to environmental education in the context of different courses in the 1968, 1992, 2000, and 2004 curriculums (Dindar & Taneri, 2011). At secondary and high school levels, environmental education has been included in the curriculum since 1992 (Ünal & Dımişkı, 1999). In the curricula implemented in Turkey between 2005-2018, environmental education was mainly in the content science of life and science and technology courses at the elementary education level. Thirty-eight of the total 290 instructional goals in the science of life curriculum and 36 of the 203 in the Science and Technology curriculum were related to environmental education (Akinoğlu, & Sarı, 2009). In current educational programs that changed in 2018 in Turkey, environmental education objectives

have increased. For example, 43 of the 148 instructional goals in the Life Studies curriculum and 26 of the 82 acquisitions in the Science curriculum are related to environmental education. In addition, it was recommended to implement activities that enable students to interact directly with the environment in these framework programs (MEB, 2013; MEB, 2018).

Studies conducted in the field of environmental education show that a qualified environmental education given at an early age contributes to students' feeling self-confident, developing creativity skills, empathizing with nature, creating awareness to protect the natural environment and respecting the nature (Caiman, Hedefalk, & Ottander, 2022; Zhakupova, Mankesh, Kyakbaeva, Karimova, & Omarova, 2022). Through child-centered environmental education, children can develop basic skills such as recognizing nature, solving problems faced in daily life, and understanding the relationship between them and nature (Yıldız Yılmaz, 2019). It is predicted that individuals who are guided to the environment and environmental problems and understand nature better at an early age will develop awareness towards wildlife and show environmentally friendly behaviors and attitudes all their lives (Ata, 2018; Körükçü, & Güngör, 2021; Yıldız Yılmaz, & Mentiş Taş, 2017). According to Erdem, Meriç, and Meriç (2019), individuals with high environmental awareness can develop more conscious solutions to solving environmental problems. Thanks to environmental education in early childhood, it is predicted that individuals who take charge and have a say in different sections of society will have environmentally friendly behaviors and attitudes (Jinliang et al., 2004). Therefore, education in schools at all levels has a significant potential to improve children's environmental awareness (Hesami Arani, Bagheri, & Ghanaian, 2016).

Some studies in the field of environmental awareness reported that there was no qualified education on environmental awareness from primary school to secondary school (Jinliang et al., 2004; Purwanti, Gunarhadi, & Musadad, 2019). Some studies claimed that the activities and materials in the curriculum were insufficient for the development of environmental awareness (Purwanti et al., 2019), and using different teaching techniques improved environmental awareness levels (Katoppo, Irwandi, Ng, & Lie, 2020). On the other hand, Rogayan and Nebrida (2019) pointed out that environmental awareness affects the search for solutions to environmental problems. In this context, it was reported that the environmental awareness of students studying in ecology-based schools was higher than students studying in traditional schools (Meiboudi, Omidvar, Enayati, & Rashidi, 2013; Wihardjo, Hartati, Nurani, & Sujarwanta, 2017), and socioeconomic level, living environment impacted knowledge and awareness (Korhonen, & Lappalainen, 2004; Fisman, 2005; Mutisya, & Barker, 2011).

In studies focusing on the environmental awareness level of primary school students, it is noteworthy that demographic variables such as parent's education level, socioeconomic level, animal nutrition, plant breeding, class level, teaching method, and the number of siblings were taken as the basis (For example; Özden, 2008; Baş, 2012; Yıldız Yılmaz, & Mentiş Taş, 2018; Çelikler, Aksan, & Yenikalaycı, 2019; Erdem, Meriç, & Meriç, 2019; Vatansever Bayraktar, & Fırat, 2020; Başaran, & Erol, 2021). In this context, the aim of this study conducted during the COVID-19 pandemic, which became a global problem after 2019, was to examine the environmental awareness levels of Turkish elementary education students in the Samsun province sample. The null hypothesis (H_0) of the study is as follows:

"There are no statistically significant differences between groups in their scores from Elementary School Environment Awareness Scale (ESEAS) in terms of gender, household income, grade, mother's graduation, father's graduation."

2. Method

This study was carried out in the general survey mode in the 2021-2022 academic year. The study's sample was determined by convenient sampling due to the pandemic conditions during the data collection. Convenience sampling is a method that provides convenience in terms of cost and time (Baltacı, 2018). The online survey form was used as a data collection tool. The teachers who agreed to participate in the study shared the data collection tool with their students in their online classrooms, and they got feedback from the students who volunteered to respond. Table 1 shows the study group's descriptive analyses regarding some demographic variables (gender, grade, household income, and parental graduation). The study group consists of a total of 260 students, 54%

(n=141) female, 46% (n=119) male, who were studying in 2nd grade (n=40, 15%), 3rd grade (n=98, 38%) and 4th grade (n=122, 47%).

Table 1: The demographic characteristics of the study group

Groups/gender		Female		Male		Total	
		n	%	n	%	n	%
Grade Level	2nd grade	24	9	16	6	40	15
	3rd grade	48	19	50	19	98	38
	4th grade	69	27	53	20	122	47
Household income	0-3000	48	18	37	14	85	33
	3001-6000	49	19	46	18	95	37
	6001-9000	28	11	19	7	47	18
	9001 +	16	6	17	7	33	12
Mother's graduation	Out of school	5	1,5	1	0,5	6	2
	Primary school	30	12	22	8	52	20
	Junior high school	24	9	17	7	41	16
	Senior high school	47	18	35	14	82	32
	University	35	13	44	17	79	30
Father's graduation	Primary school	28	11	19	7	47	17
	Junior high school	22	8	18	7	40	15
	Senior high school	42	16	36	14	78	30
	University	49	19	46	18	95	37
General total		141	54	119	46	260	100

The first part of this survey form includes demographic questions about gender, grade, household income, and mother's and father's graduation. In the second part, there was the Primary School Environmental Awareness Scale (PSEAS) consisting of 21 items in a five-point Likert type (completely agree, agree, neutral, disagree, totally disagree) about the participants' environmental awareness. The original PSEAS was developed by Yıldız Yılmaz and Mentiş Taş (2017), and it includes 35 items and four subdimensions (life in nature, recyclable energy sources, and their use, environmental responsibility, continuity of living things). The researchers stated that the validity and reliability study of the scale was limited to schools in the center of Konya province, and they recommended that the scale be applied to different samples to compare the results. Cronbach's alpha reliability coefficients of the scale were reported in the studies on Turkish primary school students in which ESEAS was used as a data collection tool (Çelik, 2020; Çelikler, Aksan, & Yenikalaycı, 2019; Erdem et al., 2019; Vatansever Bayraktar & Fırat, 2020). However, the scale's validity study was not conducted for different samples in these studies.

In the months before online education started due to the pandemic, a face-to-face pilot study was conducted with 70 elementary school students in the 2nd, 3rd, and 4th grades in elementary education schools in the center of Samsun by using simple random sampling. As a result of the exploratory factor analysis of these data, it was decided to delete 14 items from the scale since their factor loadings had high values in a few factors. Cronbach's Alpha coefficient for 21-item ESEAS was 0.84, and coefficients for the 21 items were found to vary between 0.828 and 0.841. The result shows that the scale is highly reliable (Kalaycı, 2014).

Exploratory factor analysis (EFA) was conducted to determine the construct validity of ESEAS. It is recommended that the variables show normal distribution, control for multivariate normality, and at least two variables under each factor to apply EFA (Çakır, 2014). The KMO test value of the scale was 0.56, and the Bartlett Sphericity test value was significant ($X^2=2362,795$; $p \leq .01$). The results of this analysis showed that the data matrix was suitable for factorization and the data had a multivariate normality distribution.

After the suitability of data for factor analysis was confirmed, exploratory factor analysis (EFA) was conducted using Principal Components Analysis and Varimax Rotation methods to examine the scale's factor structure. This analysis showed that five components explained 61.97% of the total variance for 21 items and had an eigenvalue

above 1%. The load acceptance level of all items was between 0.52 and 0.90, and the difference between the load values of the two items was more significant than 0.1.

As a result of exploratory factor analysis, the factor loadings of 8 items in the first sub-dimension were between 0.83 and 0.52, and the factor loadings of 4 items in the second sub-dimension were between 0.80 and 0.56. the factor loadings for three items in the third sub-dimension were found between 0.90 and 0.84, while it for three items in the fourth sub-dimension were between 0.82 and 0.54, and three items in the fifth sub-dimension were between 0.65 and 0.52.

Scale dimensions were named as in Table 2, considering the expressions in each sub-dimension: Ecocentric (E), Nature Responsibility (NR), Anthropocentric (A), Environmental knowledge (EK), and Hedonistic (H).

Table 2: Subdimensions and factor loadings of ESEAS

	Factors and items	Factor Loadings
E	M1 6 Unnecessary water consumption should not be done.	,827
	M1 9 The habitats of living things must be protected.	,761
	M1 7 Paper produced from trees should not be used unnecessarily.	,759
	M1 3 We should not damage historical artifacts.	,745
	M1 4 Water is one of the exhaustible energy sources.	,688
	M9 Living things in nature benefit the environment.	,552
	M1 8 Electricity is one of the exhaustible energy sources.	,529
	M1 5 Natural energy sources such as the sun and wind should be used.	,517
NR	M6 I have to help feed and care for stray animals.	,80 2
	M7 Animals interest me.	,72 3
	M3 Plants are indispensable parts of natural life.	,59 8
	M8 Burning forests makes me sad.	,56 3
A	M1 1 All living things feed on the same things.	,90 1
	M1 0 All living things are alike.	,83 8
	M1 2 Living things are inexhaustible (not extinct).	,83 7
HI	M2 1 I know what historical artifacts are.	,81 6
	M2 0 I know where historical monuments are protected.	,77 8
	M1 I travel to places such as forests and natural and historical areas.	,54 4
H	M2 Growing plants (flowers, trees, etc.) is fun.	,65 2
	M4 Flowers can be grown at home.	,62 4
	M5 I wonder how the vegetables and fruits I eat are grown.	,51 5

Cronbach's Alpha coefficients were found as 0.84 for the first subdimension, 0.76 for the second subdimension, 0.86 for the third subdimension, 0.68 for the fourth subdimension, and 0.60 for the fifth subdimension.

Kolmogorov–Smirnov, and Shapiro-Wilk tests were used to test whether the data showed normal distribution, and these analyzes revealed that the data were normally distributed. For this reason, independent samples t-test was conducted to compare the means of two independent groups. One-Way ANOVA was conducted to compare the means of more than two independent groups. If there was a difference between the groups as a result of the analysis of variance, the Scheffe test, one of the post hoc tests, was used to decide which groups had a significant difference.

3. Results

3.1. Gender

Table 3 shows no significant difference between the gender groups in scale scores except in the nature responsibility sub-dimension. The mean NS scores of the female group were higher than those of the male group, and this difference was statistically significant ($t_{(258)}=2504$; $p<0.05$).

Table 3: The independent samples t-test results of ESEAS scores by gender

Subdimensions	Female	Male	t	P Value	H ₀ accept/reject
Ecocentric (E)	4,65	4,61	.092	.927	Accept
Nature Responsibility (NR)	4,66	4,53	2,504	.013*	Reject
Anthropocentric (A)	2,15	2,22	-.717	.474	Accept
Environmental Knowledge (EK)	4,13	4,02	.830	.407	Accept
Hedonistic (H)	4,48	4,31	1,095	.274	Accept
Total scores of ESEAS	7,30	7,16	1,768	.078	Accept

3.2. Grade

As seen from the ANOVA analysis results in Table 4, there was no significant difference between the grade-level groups in scale scores except in the hedonic dimension ($F_{(257)}=3,247$; $p<.05$). The result of Scheffe analysis showed that there was a significant difference between the 2nd and 4th-grade groups. The mean of hedonic dimension scores of the 2nd-grade group ($\bar{x}=4.575$) was higher than the mean of the 4th-grade level group ($\bar{x}=4.355$). In terms of the variable of grade level, H₀ hypothesis was accepted except for the hedonistic sub-dimension of the scale.

Table 4: The results of the one-way analysis of variance (ANOVA) of the ESEAS scores by grade level

Subdimensions	Groups	n	\bar{x}	ss	sd	F	p	H ₀ accept/reject
Ecocentric (E)	2nd grade	40	4.681	.9645	2	.029	.972	Accept
	3rd grade	98	4.606	.9857	257			
	4th grade	122	4.632	1.0301				
Nature Responsibility (NR)	2nd grade	40	4.637	.85626	2	.044	.957	Accept
	3rd grade	98	4.561	1.0870	257			
	4th grade	122	4.625	.97784				
Anthropocentric (A)	2nd grade	40	2.358	1.10159	2	.500	.607	Accept
	3rd grade	98	2.184	.99637	257			
	4th grade	122	2.120	.97222				
Environmental Knowledge (EK)	2nd grade	40	4.125	1.03911	2	2.565	.079	Accept
	3rd grade	98	3.939	1.059903	257			
	4th grade	122	4.178	.921956				
Hedonistic (H)	2nd grade	40	4.575	.9289489	2	3.247	.040	Reject
	3rd grade	98	4.381	.9045223	257			2nd grade / 4th grade
	4th grade	122	4.355	1.074114				
Total scores of ESEAS	2nd grade	40	7.381	12.49205	2	1.512	.222	Accept
	3rd grade	98	7.176	13.57166	257			
	4th grade	122	7.240	13.05673				

3.3. Household income

The total household income of the students who participated in the study was between 2000 and 10000 Turkish liras (TL). As seen from the ANOVA result in Table 5, there was no significant difference in ESEAS scores between the four household income groups. Analysis of variance results showed that H_0 hypothesis was accepted for all factors and total scores in the scale.

Table 5: The results of the one-way analysis of variance (ANOVA) of the ESEAS scores by household income (TL).

Subdimensions	Groups (TL)	n	\bar{x}	ss	sd	F	p	H ₀ accept/reject
Ecocentric (E)	0-3000	85	4.557	1.091444	3	2.121	.098	Accept
	3001-6000	95	4.621	.9916472	256			
	6001-9000	47	4.670	.9828044				
	9001 +	33	4.784	.7023474				
Nature Responsibility (NR)	0-3000	85	4.585	.9674060	3	1.709	.166	Accept
	3001-6000	95	4.647	.8466087	256			
	6001-9000	47	4.468	1.420395				
	9001 +	33	4.712	.6874289				
Anthropocentric (A)	0-3000	85	2.118	.8634412	3	1.395	.245	Accept
	3001-6000	95	2.323	1.084828	256			
	6001-9000	47	1.943	.9794834				
	9001 +	33	2.273	1.081862				
Environmental Knowledge (EK)	0-3000	85	3.973	1.128697	3	.705	.550	Accept
	3001-6000	95	4.032	.9605459	256			
	6001-9000	47	4.199	.8999450				
	9001 +	33	4.323	.8993213				
Hedonistic (H)	0-3000	85	4.443	1.095519	3	.352	.788	Accept
	3001-6000	95	4.421	.9212850	256			
	6001-9000	47	4.284	1.016609				
	9001 +	33	4.384	.9649788				
Total scores of ESEAS	0-3000	85	7.157	12.72308	3	1.911	.128	Accept
	3001-6000	95	7.269	13.17954	256			
	6001-9000	47	7.176	13.36626				
	9001 +	33	7.444	13.66260				

3.4. Mother's graduation

Table 6 shows no statistically significant difference between the scale's sub-dimensions and the total scores regarding the mother's graduation. According to this result, the H_0 hypothesis was accepted for all sub-dimensions and total ESEAS scores.

Table 6: The results of the one-way analysis of variance (ANOVA) of the ESEAS scores by mother's graduation

Subdimensions	Groups	n	\bar{x}	ss	sd	F	p	H ₀ accept/reject
Ecocentric (E)	Out of school	6	4.333	1.2486	4	1.794	.130	Accept
	Primary school	52	4.507	.90469	255			
	Junior high school	41	4.664	.89106				
	Senior high school	82	4.630	1.1085				
	University	79	4.715	.95456				
	Out of school	6	4.667	.23156	4	1.035	.390	Accept

Nature Responsibility (NR)	Primary school	52	4.534	.92103	255			
	Junior high school	41	4.701	.82810				
	Senior high school	82	4.598	1.1770				
	University	79	4.598	.95861				
Anthropocentric (A)	Out of school	6	2.222	.87722	4			
	Primary school	52	2.289	.94606	255			
	Junior high school	41	2.358	1.1101		.687	.602	Accept
	Senior high school	82	2.081	.89379				
	University	79	2.118	1.0903				
Environmental Knowledge (EK)	Out of school	6	3.611	2.0165	4			
	Primary school	52	3.853	1.1173	255			
	Junior high school	41	4.106	.98307		1.849	.120	Accept
	Senior high school	82	4.102	.94039				
	University	79	4.228	.85784				
Hedonistic (H)	Out of school	6	4.056	1.2039	4			
	Primary school	52	4.333	.90097	255			
	Junior high school	41	4.585	1.1461		.505	.732	Accept
	Senior high school	82	4.398	1.0364				
	University	79	4.371	.93899				
Total scores of ESEAS	Out of school	6	6.952	14.791	4			
	Primary school	52	7.098	13.657	255			
	Junior high school	41	7.364	12.032		1.878	.115	Accept
	Senior high school	82	7.221	13.292				
	University	79	7.315	12.961				

3.5. Father's graduation.

As seen in Table 7, while ecocentric, there were no significant differences between the father's graduation groups for human-centered and hedonistic sub-dimension scores. However, there was a significant difference between the father's graduation groups for nature responsibility and environmental knowledge sub-dimension and total scores. According to Post Hoc analysis results, the significant difference in the nature responsibility sub-dimension was between secondary education and high school and university groups. The significant difference in environmental knowledge sub-dimension and total scores was between the elementary and university education groups. Therefore, H_0 hypothesis was rejected for these sub-dimensions of the scale.

Table 7: The results of the one-way analysis of variance (ANOVA) of the ESEAS scores by father's graduation

Subdimensions	Groups	n	\bar{x}	ss	sd	F	p	H ₀ accept/reject
Ecocentric (E)	Primary school	47	4.476	1.0834	3	1.912	.128	Accept
	Junior high school	40	4.688	.87298	256			
	Senior high school	78	4.617	1.0708				
	University	95	4.692	.93001				
Nature Responsibility (NR)	Primary school	47	4.559	.921116	3	2.539	.05	Reject*
	Junior high school	40	4.788	.656765	256			
	Senior high school	78	4.529	1.21566				
	University	95	4.608	.933266				
Anthropocentric (A)	Primary school	47	2.206	.84802	3	.896	.444	Accept
	Junior high school	40	2.325	.86182	256			
	Senior high school	78	1.996	.92341				
	University	95	2.260	1.16967				
	Primary school	47	3.801	1.0875	3	4.087	.007	Reject**
	Junior high school	40	3.925	1.3331	256			

Environmental Knowledge (EK)	Senior high school	78	4.133	.85775				
	University	95	4.237	.84289				
Hedonistic (H)	Primary school	47	4.362	.98974	3	1.994	.115	Accept
	Junior high school	40	4.600	.91573	256			
	Senior high school	78	4.321	1.0557				
	University	95	4.397	.97575				
Total scores of ESEAS	Primary school	47	7.065	12.371	3	3.256	.022	Reject ***
	Junior high school	40	7.385	11.990	256			
	Senior high school	78	7.149	13.811				
	University	95	7.334	13.091				

3.6. How are the students' environmental awareness levels according to ESEAS scores

The ESEAS is a five-point Likert-type scale, scored as "5=completely agree", "4=agree", "3=neutral", "2=disagree", "1=totally disagree". Considering the formula developed by Tekin (2002), the reference ranges of the average scores are "1.00-1.80= Strongly disagree, 1.81-2.60=Disagree, 2.61-3.40=Undecided, 3.41-4.20=Agree, 4.21-5.00=Strongly agree". A mean score between 1.00 and 2.60 indicates that the participant's level of agreement with the statements in the relevant dimension is low. In contrast, an average score of 3.41 and above indicates that the participants' level of agreement with the statements in the relevant dimension is high.

Table 8: Environmental awareness levels according to sub-dimensions

Levels/ Subdimensions	\bar{X}	sd
Ecocentric	4.6298	.43728
Nature Responsibility	4.6029	.46937
Anthropocentric	2.1808	1.14060
Environmental Knowledge	4.0795	.77199
Hedonistic	4.3987	.56987

Analysis results in Table 8 show that the participants agreed with the expressions in ecocentric (\bar{X} =4.6298), nature responsibility (\bar{X} =4.6029), environmental knowledge (\bar{X} =4.0795), and hedonistic (\bar{X} =4.3987) sub-dimensions at a high rate. At the same time, they totally disagreed with the expressions in the anthropocentric (\bar{X} =2.1808) sub-dimension.

4. Conclusion, discussion, and recommendations

This study focused on the environmental awareness of elementary school students and showed that the null hypothesis was accepted in most scores related to scale factors. These results showed that the students who participated in the study tended to have information about the environment and the factors that threatened the environment, to be sensitive to nature, and to be ready to sacrifice to solve environmental problems.

There wasn't a significant difference between the scores of male and female students except for the sub-dimension of nature responsibility. This result was consistent with some studies that focused on the environmental awareness of primary school students and used the original ESEAS as a data collection tool. Erdem, Meriç ve Meriç (2019) reported a significant difference in favor of female students in the life in nature sub-dimension. Vatansever Bayraktar and Fırat (2020), Gökçe, Kaya, Aktay, and Özden (2007) determined a significant difference in favor of females according to the gender variable in primary school students' environmental awareness of the sub-dimension of living in nature. However, previous studies have reported different results regarding the effect of gender on environmental awareness. For example, in the studies conducted by Sharmin (2003) with primary school students and Shobeiri, Omidvar, and Prahallada (2007) with secondary school students, they found no difference between genders in students' environmental awareness levels. Çakar, Güneş, and Erdoğan (2013) also determined that environmental awareness levels of female students were higher than male students, but there was no significant difference between the groups.

There was a significant difference between the grade level groups in the hedonic dimension. The 2nd-grade students' participation in the statements in this dimension was higher than the 4th-grade students. In some studies conducted with elementary education students, it was reported that grade level could be a significant variable. Yıldız Yılmaz (2019) and Çakar, Güneş and Erdoğan (2013) stated that lower-grade students have higher environmental awareness than upper-grade students. Çelikler, Aksan and Yenikalaycı (2019) also determined that primary school students were highly aware of the environment. Kiraz and Fırat (2016) also reported in their studies that the level of environmental awareness differs between education levels. Researchers stated that students in lower education levels were more emotional about ecological issues, but environmental awareness increased towards higher levels. On the other hand, Szeberényi, Rokicki, and Papp-Váry (2022) found that teaching levels did not cause a difference in students' environmental awareness levels.

It was determined that there was no significant difference in environmental awareness among household income groups. Studies conducted by Fisman (2005) and Çavuşoğlu (2019) also reached similar results. This result may be associated with the fact that the socioeconomic levels of the sample were close, as stated in Çavuşoğlu's (2019) study. The household income of the study sample was low and moderate for Türkiye. Fisman (2005) attributed the lack of significant difference in household income to the fact that children living in low-income environments did not have the opportunity to explore their environment and relate to nature due to some concerns such as security and personal fears.

The research findings showed no significant difference between the maternal education level groups. On the other hand, there were significant differences between the father education level groups for the scores in some sub-dimensions (nature responsibility, environmental knowledge) and total scores. This result was consistent with the conclusions of some studies (Erdem, Meriç, & Meriç, 2019; Özcan, 2016, Verap & Vural, 2022). Vatansever Bayraktar and Fırat (2020) determined that there was no difference between environmental awareness and mother education level groups of primary school students, while there was a significant difference according to the father's education level. In the studies carried out by Kazazoğlu (2020) with university students and Gökçe et al. (2007) with secondary school students, it was determined that the educational status of the parents did not make a difference in the environmental awareness levels of the students. Conversely, Wihardjo, Hartati, Nurani, and Sujarwanta (2017) found that parents' education levels and family support had a significant effect on students' environmental awareness levels.

ESEAS total scores explained that students had positive attitudes toward the environment. This result may be related to the positive effect of the ties they establish with the environment and the knowledge they acquire in children's early family, social and academic lives. Studies on environmental education literature showed the importance of providing environmental education to gain concrete experience in developing environmental attitudes and awareness in students, that is, establishing direct interaction with the environment (Kurt Gökçeli et al., 2021). Various books on environmental education can be alternative materials to meet the educational needs of children to increase their awareness of the environment (Nurlaili & Priscylio, 2020).

Strengthening the commitment of children to nature, who have to stay away from the environment directly or indirectly due to technological developments and urbanization, and increasing their environmental awareness and consciousness should be the primary goals of today's education programmers and teachers. In an experimental study by Muldoon, Shelford, Holland, and Hryciw (2019) on children between the ages of 9 and 12, it was reported that there was a positive development in the awareness of children participating in environmental education and the difference between gender groups was significant. Similar results were obtained in another study, and it was determined that the environmental attitudes of children who participated in a five-day-long environmental education program developed positively (Mehra & Kaur, 2010). In this context, it is essential to revise the subjects on environmental education given at the theoretical level in the current curriculum so that children can interact with nature and establish a direct connection with it. In addition, it will be appropriate behavior for the basic components of the education world, such as students, teachers, parents, and administrative management, to be able to provide all kinds of academic and social opportunities for students/children to establish a relationship with nature and to carry out activities in this direction. Likely, students' developing positive awareness of the environment in which they were born and lived at the beginning of their education will positively reflect on their academic and social lives. Students with environmental awareness will have the skills to be aware of the changes

occurring in their environment, the adverse environmental conditions or problems they encounter in the early period, and to produce different solutions. For this reason, education for the environment will play an essential role in the continuation of this positive attitude towards the environment, which is present in the early ages of the students.

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Foreign Language Teachers' Attitudes and Motivation Towards Distance Learning

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Abstract

Language is an important tool of communication, especially in a foreign setting. Foreign language teachers, help their students to access foreign experiences by reason of their ability to communicate with foreign nationals. Teachers' motivation however influences foreign language education and its effectiveness. The aim of this study is to examine the predictive effect of foreign language teachers' motivations on their attitudes towards distance education. For this purpose, 356 foreign language teachers who teach in Turkey (240 females, 116 males) were reached. The ages of the teachers are in the range of 23-64 and the mean is 41.9 (SD =9.44). Personal Information Form, Attitude Scale Toward Distance Learning (ASTDL), and Academic Motivation Scale (AMS) were applied to the participating teachers. Multiple regression was used to analyze the data in the study. Accordingly, extrinsic motivation predicts both positive and negative attitudes towards distance education. In addition, motivation predicts a positive attitude.

Keywords: Distance Learning, Attitude, Intrinsic Motivation, Extrinsic Motivation, Amotivation

1. Introduction

1.1 Introduce the Problem

Traditional face-to-face training became unavailable in the last months of 2019 due to the outbreak of COVID-19. Teachers and students who could not go to schools due to Covid-19 started to do their lessons via distance education. Although the students born after 2000, known as Generation Z, also referred to as the internet generation formed the majority, however, were they ready for distance education? Perhaps the most important question is how ready the teachers (trainers) were. In other words, teachers' attitudes towards distance education, their knowledge / skills / abilities to use distance learning tools, their rate of transferring their knowledge to students, their teaching motivation (Sauro & Chapelle, 2017) will determine the success of this type of education. Studies have shown that a teacher's competence positively affects teachers' participation in professional learning activities and increases the quality of teaching (Goddard et al., 2000; Özdamli, et al., 2009; Thoonen et al., 2011; Tschannen-

moran & Woolfolk, 2001). The inevitability of distance learning with the Covid-19 pandemic has forced teachers into distance education.

The P21 foundation summarizes the skills expected from students as the first quarter of the 21st century is almost complete. This can be seen in Figure 1. These skills, which are called 21st century skills, are under almost all headings of foreign language learning (3R), communication (4C) and effective use of technology. P21 includes key subjects (3Rs: English, reading and language arts, world languages, arts, mathematics, economics, science, geography, history, government, and civic knowledge). It consists of three main skill areas referred to as ‘career skills’, ‘learning and innovation skills’, ‘knowledge, media and technology skills’ (Kyllonen, 2012; P21, 2019; Trilling & Fadel, 2009).



Figure 1: 21st century skills

Source: P21 (2019)

Communication skills can be defined as expressing thoughts and ideas by using verbal (Korkut Owen & Demirbaş Çelik, 2018), written and non-verbal communication skills effectively in various forms and contexts, being an active listener and communicating effectively in different environments (including multilingual) (P21, 2019; Trilling & Fadel, 2009). It is believed that one of the subjects that contribute to the practice in the development of these skills is foreign language teachers. The use of distance learning in foreign language teaching dates back to the 1980s. One of the first examples of this is that the National British Program in England in the 1980s taught French via radio and television (Clifford, 1990). U.S. Congress, Office of Technology Assessment (1989) found that language learning through distance learning is as successful as face-to-face language learning (U.S. Congress, 1989). Since those days, there have been many technological developments. These developments positively affected all stages of language learning. For example, with the developments in the field of telecommunications, the communication between the teacher and the learner, the learner and the learner has provided the opportunity to be done very quickly in written, oral and visual forms. Likewise, both web 2.0 applications and artificial intelligence-based applications (such as Duolingo) give very good results for the writing, reading and listening stages (Al-Johali, 2019; Otto, 2017; Yavuz et al., 2020).

1.2 Distance Learning

Distance learning is defined as the learning method where the teacher and the learner are in different places and communication is provided by technological tools (Atabek, 2020; Keegan, 1996). Today, although the definition of distance learning remains basically the same, it can be done in different ways. According to the definition made by the University of Wisconsin Continuing Education Group, “*Distance learning is designed to provide student interaction and learning certification; It is a planned learning / teaching experience that uses a wide range of technologies to reach a distant audience*”. The most important reason for this definition change is the developments in the field of educational technologies. Distance learning has removed all borders and walls in education. In other words, distance learning provides the opportunity to learn at the desired age, place and time, at the desired speed, using the desired environment. Features such as distance, time, place, age, socio-economic

status, physical disability keep distance education and lifelong learning are always on the agenda (Algharaibeh, 2020; Riga et al., 2020).

Attitude is defined as the intensity of the positive or negative emotion about a psychological object (Ajzen, 2005; Petty & Krosnick, 2014; Pratkanis, 2014; Thurstone, 1931). According to Thurstone (1931), attitude treats objects only in terms of an evaluation (affirmative-negative or preferred-not preferred) (Ajzen, 2005). For this reason, it is important to determine the positive and negative attitude when examining the attitude towards distance education. However, according to the definition accepted by social psychologists in recent years, attitude brings integrity and consistency to the individual's thoughts, feelings and behaviours towards an object (Albarracin & Shavitt, 2018; Bohnner & Dickel, 2011; Tavşancıl, 2018). From this point of view, distance learning is considered by Çelik & Uzunboylu (2022) as four sub-dimensions under the positive and negative upper dimensions of the attitude towards distance education. The positive attitude dimension consists of the usefulness of distance learning as an educational tool and the preference of distance education. Negative attitude consists of sub-dimensions of communication deficiencies in distance learning and preferring face-to-face training (Figure 2).

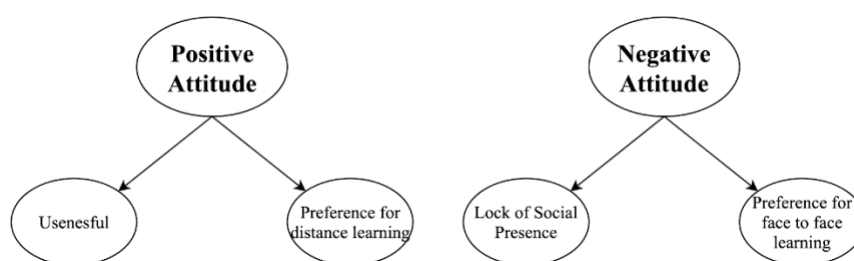


Figure 2: Attitude toward distance learning

Source: Çelik and Uzunboylu (2022)

If individuals (teachers) have a positive attitude towards distance education, they adopt distance learning as a useful tool and want to teach with distance learning (Çelik, 2021). Teachers' positive attitudes towards teaching bring them closer to education (Johnson & Howell, 2005). According to Büssing et al. (2019), attitude towards teaching increases the desire to teach. Similarly, it is thought that positive attitude towards distance learning will increase teachers' desire to teach and thus their success (Illarionova et al., 2021). However, teachers with a negative attitude tend to prefer the education environments they are accustomed to and know, that is, face-to-face education. The most important arguments for this will be their belief that they cannot provide social presence in distance education. That is, they will explain the negative attitude with the lack of social presence (Rahimi et al., 2020; Sutiah et al., 2020). Some of the physical factors that will negatively affect teachers' attitudes towards distance learning can be listed as follows: the absence of additional payments for the number of students in the classroom and the time spent, the inability to receive visual feedback from students, concerns about the quality of the content, insufficient training and resources, increased workload, lack of online teaching experience and change in teachers' traditional roles (Güler & Özkan, 2018; Lloyd et al., 2012).

Distance learning seems to be an indispensable method during and after the pandemic process which is defined as the new normal. In order to increase the effectiveness of distance education, teachers need to make extra effort to learn the intricacies of technology and develop their enthusiasm and passion for teaching (Yehya, 2020). In order for this effort to be made and to maintain its continuity, teachers need this driving force called motivation. When the teacher's motivation is noticed by the students, the students' interest, desire and enthusiasm for learning increases (Mishra, 2020). Regardless of the learning and teaching environment, motivated behaviour is positively influenced by motivational factors (Maehr & Braskamp, 1986; Salehi & Abdi, 2019; Thoonen et al., 2011).

1.3 Motivation

According to Self Determination Theory (SDT), people are born with an innate instinct to act (Ryan & Deci, 2000a). However, it is not always possible for people to act with intrinsic motivation (Algharaibeh, 2020). Therefore, the motivation that drives a person can arise not only from one's internal resources but also from external sources (Manchanda, 2017). The motivation that occurs due to an extrinsic reason in SDT is called

extrinsic motivation. At this point, it is important to regulate and internalize extrinsic motivation. SDT has developed a comprehensive motivational model for this process (Ryan & Deci, 2000b).

Lee (2000) stated that many factors affect motivation. These factors are lesson design, the level of interaction and facilitating student motivation, and the fact that the teacher and learner are in separate spaces negatively affects motivation, and collaborative environments should be provided to prevent this. Computer use anxiety caused by the lack of sufficient computer experience and skills also causes a decrease in motivation (Ekizoglu & Ozcinar, 2010; Elci & Kuloglu, 2019; Elsayed & Salama, 2020; Lee, 2000).

The source of motivation in the teaching-learning process varies (Ryan & Deci, 2000a; Urea, 2018). As with students, teachers also need to be motivated to be effective in distance education. If the desire to teach emerges with the teacher's own will and effort, if the motivation is based on an internal reward, the source of motivation comes from outside (Balaban-Sali, 2004). In addition, sometimes there may be a lack of motivation. There are many dynamics that are integrated in the person who loves his profession. It can be said that one of its main dynamics is motivation (Dörnyei & Ushioda, 2012). Once a person understands the components of the structure of motivation, he or she can be better motivated and stay motivated (Weiner, 2013). In a comparative study with distance learning students and students taking courses on campus, distance learning students showed higher intrinsic motivation (Wighting et al., 2008). Based on this, it is thought that the intrinsic motivation of distance learning teachers will also be high. Teachers who are intrinsically motivated can use many different strategies and perform better academically (Tavoosy & Jelveh, 2019; Ünal-Karagüven, 2012). When the teacher remains motivated and enjoys the teaching profession, students do not only learn the content the teacher teaches, but students are also motivated to learn (Czubaj, 1996).

1.4 Purpose of the Study

The aim of this study is to examine the predictive effect of foreign language teachers' motivations on their attitudes towards distance education. In order to achieve these aims, the authors have sought to answer the following questions:

1. Is Distance learning attitude and motivation associated with foreign language teachers?
2. Does motivation in foreign language teachers predict attitude towards distance education?

2. Method

2.1 Participants

Three hundred and fifty-six (356) volunteers participated in this study as foreign language teachers from Turkey. Two hundred and forty (240) representing 67.4% of the participants are female and 116 (32.5%) are male. The ages of the teachers are in the range of 23-64 and the mean is 41.9 (SD = 9.44). The working time of the teachers participating in the study varies between 1-40 year, with an average of 16.9 (SD = 9.28). In terms of branches, 221 (57.6%) are English teachers, 53 (13.8%) are German teachers, 48 (12.5%) are Arabic teachers, 46 (12%) are French teachers and 16 (4.2%) other (Russian, Chinese, Japanese etc.).

2.2 Measures

2.2.1 Personal Information Form (PIF)

The participants were asked questions regarding gender, age, professional experience and which language they teach.

2.2.2 Attitude Scale Toward Distance Learning (ASTDL)

The attitude scale towards distance learning was developed by Çelik & Uzunboyu (2022) to determine how individuals perceive distance education. The scale is 16 items and is graded in a 5-point Likert type. Total score is not obtained from the scale. The dimensions of the scale are scored separately. The scale has four sub-dimensions:

usefulness, lack of social presence, preference to distance learning, and preference to face to face learning. Among these dimensions, usefulness and preference to distance learning constitute the upper dimensions of positive attitude, lack of social presence and preference to face to face learning. According to the reliability study of the scale on university students, the internal consistency coefficients were Cronbach alpha (α) .81 for usefulness, .73 for lack of social presence, .67 for preference for distance learning, and .82 for preference for face-to-face learning.

The two-dimensional (positive attitude and negative attitude) structure of this scale was applied to teachers using the same questions in this study. Goodness of fit values according to CFA performed: [χ^2 (103, N = 356) = 473.04, $p < .01$; GFI = .85; CFI = .78; IFI = .78; SRMR = .084; RMSEA = .097]. The internal consistency coefficients obtained in this study were .83 for positive attitude and .73 for negative attitude, respectively.

2.2.3 Academic Motivation Scale (AMS)

The academic motivation scale was developed by Vallerand et al. (1992). With the scale consisting of 28 items and 7 sub-scales, intrinsic motivation (intrinsic motivation to know, intrinsic motivation to accomplish, and intrinsic motivation to stimulation), extrinsic motivation (external regulation, introjected regulation, and identified regulation) and amotivation can be measured. The subscales in the 7-point Likert scale are scored separately. Scores between 7-28 can be obtained from each subscale and it is understood that the motivation source indicated by the subscale with a higher score is high. In this study, the Turkish version of the scale adapted by Ünal-Karagüven (2012) was used. In addition, the evaluation of the scale can be made according to three dimensions combined (extrinsic motivation and intrinsic motivation) (Karataş & Erden, 2012). In this adaptation study, the internal reliability coefficient of the extrinsic motivation sub-dimension was .84, the internal reliability coefficient of the extrinsic motivation sub-dimension was .83, and the internal reliability coefficient of the intrinsic motivation sub-dimension was .87. In this study, the internal consistency coefficient was calculated as .87, .89 and .93, respectively.

2.3 Data Analysis

In this study, the data were analyzed with the SPSS 20 program. In the research, the normality assumption was tested first. Accordingly, it was determined that Kolmogorov-Smirnov values of all variables were above .05. Scatter diagrams were checked for the assumption of linearity of the relationship between variables. From the assumptions of the regression analysis, the presence of multicollinearity was investigated by looking at tolerance and variance inflation factor (VIF). As a result of examining the VIF and tolerance values of the dependent variables, it was calculated that the VIF values ranged between 1.03 and 2.60 (the highest = 2.60 < 5), and the CI values were between .385 and .973 (the lowest = .385 > .2). In this study, it was determined that VIF and tolerance values fulfil the relevant condition. It is concluded that these values also do not show multiple linear relationships between variables (Gravetter & Wallnau, 2016). Finally, the relationship between variables was examined to determine whether there was a correlation between variables. Multiple regression was used in the analyses.

3. Results

In this study, positive attitude, and negative attitude, which are the dimensions of the ASTDL, are considered as dependent variables. Independent variables are intrinsic motivation, extrinsic motivation, and lack of extrinsic motivation. Descriptive statistics of the dependent and independent variables in the study and the correlations between these variables are presented in Table 1.

Table 1: Means, standard deviations (SD) and bivariate correlations among all variables

	Mean	SD	PA		NA		IM		EM	AM
Positive Attitude (PA)	33.11	7.95	—							
Negative Attitude (NA)	20.54	5.11	.218	***	—					
Intrinsic Motivation (IM)	56.50	17.79	.183	***	.298	***	—			
Extrinsic Motivation (EM)	58.20	15.92	.275	***	.339	***	.777	***	—	

Amotivation (AM)	9.93	6.59	.241	***	-.026	-.079	.028	—
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Note. * $p < .05$, ** $p < .01$, *** $p < .001$

According to Table 1 is, the positive attitude towards distance learning and intrinsic motivation is ($r = .218$, $p < .001$), extrinsic motivation ($r = .183$, $p < .001$) and extrinsic motivation ($r = .241$, $p < .001$). There was a low level of positive correlation. A low-level positive correlation was found between negative attitude towards distance learning and intrinsic motivation ($r = .298$, $p < .001$) and extrinsic motivation ($r = .339$, $p < .001$).

Table 2: Regression analysis for Positive Attitude.

	B	SE	β	t	p
Intrinsic Motivation (IM)	-0.00814	0.0361	-0.0182	-0.226	.822
Extrinsic Motivation (EM)	0.14117	0.0402	0.2825	3.512	< .001
Amotivation (AM)	0.27986	0.0612	0.2319	4.570	< .001

Note: Dependent variable is *Positive Attitude (PA)*; predictors are *Intrinsic Motivation (IM)*, *Extrinsic Motivation (EM)* and *Amotivation (AM)*.

According to Table 2, a multiple linear regression was calculated to predict positive attitude based on intrinsic motivation, extrinsic motivation and amotivation. A significant regression equation was found ($F_{(3,347)} = 17.3$, $p < .001$), with an R^2 of .123. Participants' predicted positive attitude is equal to $22.57426 - (-0.00814) IM + 0.14117 EM + 0.27986 AM$, where IM, EM and AM are measured as total score in sub-dimensions. Positive attitude increased -0.00814 points for each point of intrinsic motivation, 0.14117 for each point of extrinsic motivation and 0.27986 for each point of amotivation. Both extrinsic motivation and amotivation were significant predictors of positive attitude.

Table 3: Regression analysis for Negative Attitude.

	B	SE	β	T	p
Internal Motivation (IM)	0.0252	0.0230	0.0877	1.10	0.274
Extrinsic Motivation (EM)	0.0870	0.0257	0.2706	3.38	< 0.001

Note: Dependent variable is *Negative Attitude (NA)*; predictors are *Intrinsic Motivation (IM)*, and *Extrinsic Motivation (EM)*.

According to Table 3, a multiple linear regression was calculated to predict negative attitude based on intrinsic motivation and extrinsic motivation. A significant regression equation was found ($F_{(2,348)} = 23.2$, $p < .001$), with an R^2 of .118. Participants' predicted negative attitude is equal to $14.0581 - 0.0252 IM + 0.0870 EM$, where IM and EM are measured as total scores in sub-dimensions. Negative attitude increased 0.0252 points for each point of intrinsic motivation and 0.0870 for each point of extrinsic motivation. Only extrinsic motivation was a significant predictor of negative attitude.

4. Discussion and Conclusion

In this study, the predictive effect of motivation types of foreign language teachers on their positive and negative attitudes towards distance learning was examined. First of all, the relationship between motivation and attitude towards distance learning was considered. Accordingly, it has been determined that positive attitude towards distance learning is intrinsic, extrinsic, and amotivation correlated. Negative attitude towards distance learning is associated with intrinsic and extrinsic motivation. Both external motivation and extrinsic motivation were significant predictors of positive attitude. Only external motivation was a significant predictor of negative attitude.

While positive attitude towards distance learning is associated with all types of motivation, negative attitude is associated with intrinsic and extrinsic motivation. The attitude towards distance learning can be considered to contain many elements. For example, teachers are expected to transfer their teaching competencies to technological tools (Akbas et al., 2018; Cullen & Greene, 2011). Thus, both teaching competence (Wang et al.,

2014) and technological literacy competence (Senkbeil & Ihme, 2017) can affect the types of motivation of teachers. Of course, individual differences (Niżegorodcew, 2012; Skehan, 2014) between teachers will also be effective at this point.

Intrinsic motivation is associated with both positive and negative attitudes. This result can be handled in two ways. First, it shows that teachers with high intrinsic motivation are motivated to work under all conditions, that is, the urge to teach continues in distance education environments. On the other hand, teachers who have high intrinsic motivation may want to communicate face to face with their students (Çelik and Uzunboyly, 2022). They want to apply the teaching methods and techniques they use in traditional education in distance learning. However, in order to provide distance learning, teachers must perform extra efforts. Studies have mostly found that teachers do not have additional preparation and planning time, and they use the activities in their face-to-face lessons in online environments, which affects students and teachers' performance, motivation, interest and participation in the lesson (Apipalakul et al., 2017; Güner et al., 2016). Teachers caught unprepared for distance learning due to the pandemic may have adopted a negative attitude because they think that they cannot use the teaching methods and techniques they use in traditional education in the distance learning environment. Despite all these related factors, it was found that intrinsic motivation did not explain the attitude towards distance education. The reason for this finding may be that distance learning is very new compared to traditional education environments and foreign language teachers have not yet developed an attitude about the effectiveness of these new environments (Kurt & Yavuz, 2018).

Extrinsic motivation is also associated with both positive and negative attitudes. Extrinsic motivation means that the individual is motivated by an external influence (Cardinali & Barbeito, 2018; Ryan & Deci, 2000a). These external effects may be factors such as the obligation to teach, suggestions made by the school administration, and the image of teaching (Ryan & Deci, 2020c). These factors can be associated with a positive attitude towards distance education. As a matter of fact, a study found that mechanisms such as rewards played a role in increasing the motivation of unwilling teachers and thus forming a positive attitude (Dotters-Katz et al., 2016; Mola & Dagnew, 2020). One of the factors determining the extrinsic motivation of the teacher is student interest (Keller et al., 2017). Students interest in distance learning can also increase teachers' motivation. For this, having interactive platforms, at least interactive lessons with the relevant students, can play an active role. Of course, another problem here is the preparation process for the lesson because distance learning may require more preparation than normal education. Because of these factors, teachers may develop negative attitudes. In this context, external motivation was found as significant predictors of positive and negative attitude. Cullen & Greene (2011) also revealed in their study that extrinsic motivation predicts teachers' attitudes in the context of technology integration.

Extrinsic motivation is only associated with positive attitude. At the same time, extrinsic motivation predicts positive attitude towards distance education. If the teacher has no motivation at all, which may have psychological / sociological reasons related to the pandemic process, the teacher may also be unmotivated in his normal life. Teachers who see distance learning as a means of escape from school, who do not want to communicate with students much, and who still try to teach are expected to show a positive attitude.

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The Effect of Turkish Pronunciation Training on Brain: An fMRI Study

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Abstract

This study aimed to develop the pronunciation skills of students who learned Turkish as a foreign language and determine the extent of the instruction given for that purpose by observing its cognitive effects. It was designed as an in-class action research and carried out with nine students speaking different languages. Of those, five were bilinguals: Four were native speakers of their native tribal language and French, and one was a native speaker of Kazakh and Russian. The remaining four students were native speakers of Arabic. The fMRI findings at the beginning and the end of the study showed that phonological and reading motor processes were better for bilingual learners who were native tribal speakers and learned French and Mongolian as their country's official language, compared with native Arabic monolingual learners. Based on the analysis, it can be stated that an increase in foreign language sound awareness of learners results in the acquisition of more accurate pronunciation skills.

Keywords: Teaching Turkish as a Foreign Language, Pronunciation, Speech Centers in the Brain, Speaking Instruction, Broca's Area, Functional Magnetic Resonance Imaging (fMRI)

1. Introduction

Speaking, which is a complex motor skill (Levelt, 1989), develops easily and spontaneously in the process of native language acquisition (Hu et al., 2012, p.1). In the acquisition process, the vocal organs and two cortical centers in the brain are actively involved. These centers form the physical and cognitive aspects that play a crucial role in the development of the speaking skill. The cortical centers located around the Sylvian fissure in the left hemisphere of the brain are referred to as the Broca's and Wernicke's areas (Troike-Saville, 2012, p.72). Of these, the Wernicke's area functions as the sound format repository, and the Broca's area acts as the processor that receives the necessary phonological information from this repository (Heim & Friederici, 2003). Phonology is used predominantly in the Broca's area (Tanrıdağ, 2009, p.158). Although the cognitive processes responsible for language production and comprehension take place in the left hemisphere (Troike-Saville, 2012, p.73), the speaking skill utilizes the simultaneous functioning of the right and left hemispheres of the brain. The ability of an individual to realize the speaking skill in a correct and meaningful way depends on both physical and cognitive development and maturity. In the development of this ability, the role of pronunciation acquires prominence,

especially for correct and effective speech in a foreign language.

Significant individual differences occur in late-onset (around 10 years) bilinguals who learn a foreign language (Reiterer, et al., 2011, p.1). A study found that individuals who started learning a foreign language at an early age generally achieved a higher level of proficiency than those who started at a later age (Hyltenstam & Abrahamsson, 2003). Although the acquisition of a foreign language is possible after childhood, some problems impede the process (Lenneberg, 1967, p. 176). One of those problems is pronunciation as it can easily hinder intelligibility. Therefore, the teaching of pronunciation in foreign language instruction necessitates a multidimensional and stimulus-rich educational process.

In learning the sound system of a foreign language, the learner's mother tongue is of paramount importance. The number of the mother tongue sounds or the absence of exact equivalents of the target language sounds can prevent learners from producing the target language sounds accurately (Karatay & Tekin, 2019a). One of the most common causes of pronunciation problems has to do with perception, which refers to the learners' perceiving the sounds of the target language through the phonological filter of their mother tongue. In other words, the learners may not hear the sounds in the way a native speaker does (Derwing, 2008). When target language sounds are not perceived and produced correctly, "accent" occurs in the learners' spoken production of the target language. Different explanations have been provided for the emergence of a foreign accent in speech. The first is the replacement of a foreign language sound with a native language sound. The second is ignoring sounds that do not exist in the native language, and the last is maintaining mother tongue sounds while speaking the foreign language (Flege, 1995). In other words, learners can transfer their mother tongue features to the target language.

Therefore, using an efficient model of pronunciation would ensure that the target language sounds are identified and distinguished. Such an instructional model would include a large array of activities that would introduce learners to the segmental and suprasegmental features of the target language and provide ample opportunities for practice.

A model of pronunciation teaching that would introduce and provide ample practice opportunities of the target language segmental and suprasegmental features should be multi-directional and include multi-stimulus providing activities. There are studies that focus on the pronunciation problems of students who learn Turkish as a foreign language. These studies can be grouped as descriptive and experimental. Descriptive studies focus on segmentals (Adalar Subaşı, 2010; Beydilli Kaya, 2019; Biçer, Çoban & Bakır, 2014; Demir & Güleç, 2015; Doğan, 2007; Gürbüz & Güleç, 2016; İnan & Öztürk, 2015; Kahraman 2018; Karababa Candaş, 2009; Kaplan, 2018; Kurt, 2017; Kurt & Demir, 2016; Morali, 2018; Nurlu & Özkan, 2016; Özmen, Güven & Dürer, 2017; Şengül, 2014) and suprasegmentals (Alshirah, 2013; Çelebi & Kibar Furtun, 2014; Şenyiğit & Okur, 2019; Sis & Ateş, 2018; Tüm, 2014; Uğur & Azizoğlu, 2016). Experimental studies focus on the teaching of segmental and suprasegmental units of pronunciation (Çerçi, 2014; Erdem et al., 2015; Erten Dalak & Mercan, 2017; İlgün, 2015; Karatay, Güngör, & Özalan, 2019; Özkaya, 2012; Yılmaz & Şeref, 2015). An overall evaluation of these studies would show that the focus is more on segmentals and that the experimental studies are limited in number.

Unlike the previous studies that focused on either the segmental or suprasegmental features of Turkish, this study adopts a holistic approach that allows it to simultaneously focus on those features and aims to develop the linguistic and imitation abilities of learners of Turkish as a foreign language in a communicative context. In the adopted approach, individual sounds are presented dually in isolation and in multiple utterance contexts because teaching the pronunciation of a sound in those contexts may result in permanence in learning the target language sounds. Teaching the Turkish sound system through this approach and determining the cognitive effects of learning sounds in the Broca's area through fMRI imaging may provide useful information for teachers who are involved or interested in pronunciation teaching effectively.

This study was initiated to seek answers to the following research questions:

1. Is pronunciation training given in accord with the holistic approach effective in improving the pronunciation errors of learners?
2. Does such pronunciation training lead to changes in the involved areas of the brain?

2. Research Design and Method

This study was designed as in-class action research. In action research studies, the interested parties “define the problems to be examined, cogenerate relevant knowledge about them, learn, and execute social research techniques, take actions, and interpret the results of actions based on what they have learned.” (Greenwood & Levin, 2007, p.3). Thus, ways to improve existing practices through the incorporation of new ideas are investigated, necessary actions for improvement are taken and the effects of those actions are assessed (Calhoun, 2002). In this study, suitable approaches, methods, and techniques that improve pronunciation skills were determined and used to improve the pronunciation problems of international students learning Turkish.

Three approaches are used in pronunciation teaching. These are the Analytical-Grammatical, Intuitive-Imitative, and Holistic approaches. Of these, the holistic approach, which addresses both the analytical linguistic ability and the communicative skill and focuses on segmental and suprasegmental units at the same time, was used in this study. In the devised action plan, sound awareness activities, correct pronunciation of the sounds, and spelling activities with words were done at the beginning of the A1 level. At the A2 level, activities for teaching sounds in words and sentences and pronunciation activities that showed students how to express emotions were done. At the B1 level, word and sentence stress, pronunciations of those units, and drama and role-play activities were practiced in addition to the teaching of sounds in words. Thus, the holistic learning approach was implemented by providing training in both segmental and suprasegmental units. The training was implemented for a weekly total of two hours for fifteen weeks. The length of provided training was 3 weeks at the A1 level. The training period was 6 weeks for each of the A2 and the B1 levels. The implementation process was planned as follows:

2.1. Implementation Process

- 2.1.1. Examination of current practices: The examination of the textbooks used in instruction showed that the activities geared toward developing pronunciation skills were limited.
- 2.1.2. Identifying the pronunciation problems of learners: At the A1 level, a text in Turkish was read aloud by each student and recorded. The recordings were analyzed and the pronunciation errors the learners had made were identified. After the pronunciation problems were identified, fMRI images of the learners (the first test) were taken to determine the areas involved in their brains during their pronunciations of Turkish sounds.
- 2.1.3. Identifying activities to improve pronunciation errors: In line with the holistic approach, it was decided that 20 interesting activities out of the 44 activities previously determined by the researchers would be used (Karatay & Tekin, 2019a, 2019b).
- 2.1.4. Implementation: "Listen to the Sound of Turkish", "How Many Times Have You Heard the Sound?" and "Feel the Sound" activities were implemented respectively at the A1 level for three weeks. At the A2 level, the "Feel the Sound", "Distinguish What You Are Listening to", "Coloring", "Mini Dictation", "What Sounds Can You Make?", "Silent Dictation", "Bingo", "Reading Out Loud", "Pay Attention to the News!" and "Sound Scoring" activities were implemented.
- 2.1.5. Assessment, evaluation, and reflection: The learners were recorded once again at the end of the A2 level which was the first proficiency level of the study, and the analyses of the recordings showed improvement in the learners' pronunciations of the majority of the problematic sounds. It was also observed that some sounds had not been corrected. Following this phase of the study, the implementation plan was continued.
- 2.1.6. Revising and implementing the revised plan: The "Ear to Ear", "Mini Dictation", "The Smallest Couple", "Tongue Twisters", "Reading Out Loud", "Rhythmic Speaking", "Emotional States of Language", "Which Word?", "Creating Meaning in Pronunciation", and "Stress in Sentence" activities were implemented at the B1 level for the suprasegmental features of Turkish while the teaching of segmental sound units continued.
- 2.1.7. Evaluating the action research plan and sharing the findings: At the end of the B1 level, it was observed that the mispronunciations of most of the problematic sounds had been corrected. The changes and cognitive developments in the learners' brains caused by the

improvement in pronunciation skills were described for each learner and in terms of the learners' mother tongues.

2.2. Study Group

The study group consisted of 9 volunteer students who were learning Turkish as a foreign language at the Bolu Abant İzzet Baysal University Turkish Education Application and Research Center (TÖMER) in the 2018-2019 academic year. The students were selected, using the purposive sampling method, from among the students who were experiencing pronunciation problems. The sample consisted of 7 males and 2 females who were 18-20 years of age. Arabic was the mother tongue of 4 students; 4 students were native speakers of French, and there was 1 student who was a native speaker of Mongolian/Kazakh.

2.3. Data Collection

The data consisted of the audio recordings and the fMRI images of the participants and were collected through document analysis. The audio recordings were made three times at the end of the A1, A2, and B1 levels. The fMRI images were taken twice at the end of the A1 and B1 levels. At the A1 and B1 levels, all students were asked to read aloud a level-appropriate Turkish text for 10 minutes in the MR device, and their pronunciations were recorded to detect the specific sound errors they made individually. The students' brain images were also taken simultaneously to help account for the errors they made in the production of the sounds in the texts. The audio recordings were transcribed and subsequently analyzed for pronunciation errors. The fMRI images of the participants were taken at the A1 level and B1 level to determine whether and to what extent differences occurred in their brains as a result of the instruction given.

A 1.5 magnetic resonance device (Symphony; Siemens Medical Systems, Erlangen, Germany) with a superficial coil for the head and neck was used to obtain the fMRI data. The functional imaging was obtained by blood oxygen level-dependent sensitive gradient echo-planar imaging sequence to observe the response of the blood flow in the brain of each participant during the 1st (A1 level) and 2nd (B1 level) tests. For anatomical imaging, a fast acquisition gradient echo sequence prepared by high-resolution three-dimensional magnetization was taken from each participant.

2.4. Analysis of Data

The data obtained through the students' voice recordings were analyzed by doing content analysis. The fMRI data were uploaded to the radiology workstation and analyzed by an expert radiologist using the BOLD software. To report the results of the analyses, the nine participants were coded and numbered as "P1-P9". The errors in the students' voice recordings were classified into two categories as vowel errors and consonant errors. The improvements for each level were identified and presented in graphs. Examples of pronunciation errors in words are given in Appendix 1.

3. Findings

First research question: To seek answers to this question, the pronunciation errors that were determined based on the analysis of the transcribed recordings of the students' reading texts at the end of the A1, A2, and B1 levels were used.

The findings will be presented in three groups based on the native languages of the participants by levels. Thus, first, the phonetic errors of the students whose native language was Arabic will be given. This will be followed by the phonetic errors of the students who were native speakers of French. Finally, the errors made by the student who was a native speaker of Mongolian/Kazakh will be presented.

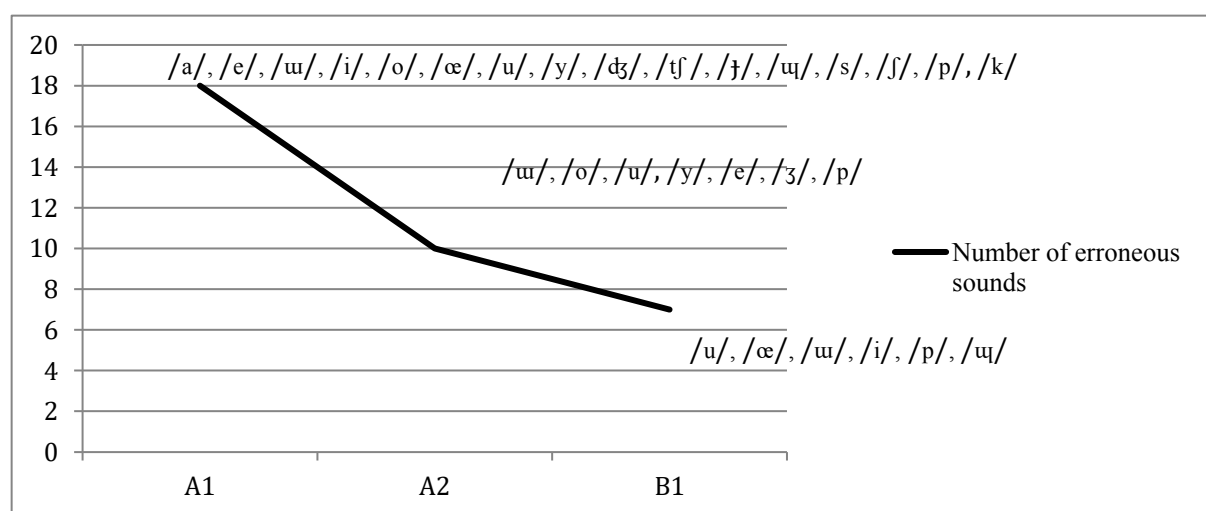
3.1.1. Pronunciation Errors Made by The Arabic Native Speaker Students by Proficiency Levels

P1, who was an Egyptian female student, could not pronounce the vowels /a/, /e/, /u/, /i/, /o/, /œ/, and /y/ and the consonants /dʒ/, /tʃ/, /ʃ/, /p/, and /k/ correctly. The vowel sounds /o/, /e/, and /u/ were incorrect at the A2 level. At the B1 level, only the vowel /u/ and the consonant /p/ were incorrectly pronounced.

P2, who was a Palestinian female student, could not pronounce the vowels /a/, /e/, /i/, /o/, /œ/, /u/, /y/, and /ʊ/ and the consonants /ʒ/, /dʒ/, /p/, /s/, and /tʃ/ at the A1 level correctly. The student could not pronounce the vowels /ʊ/ and /u/ and the consonant /p/ correctly at the A2 level. At the B1 level, only the vowel /i/ was incorrectly pronounced.

P3, who was a Palestinian male student, could not pronounce the vowels /i/, /e/, and /ʊ/ at the A1 level. At the A2 level, the vowel /u/ was pronounced incorrectly. The consonant /tʃ/ was the only incorrectly pronounced sound at the B1 level.

P4, who was a Yemenite male student, could not pronounce the vowels /e/, /ʊ/, /œ/, /y/, /i/, /u/, and /o/ and the consonants /dʒ/, /p/, /s/, /tʃ/, and /ʃ/ correctly at the A1 level. At the A2 level, the student pronounced the vowels /e/, /ʊ/, and /y/ and the consonant /ʒ/ incorrectly. At the B1 level, the student incorrectly pronounced the vowels /œ/ and /u/ and the consonants /p/ and /tʃ/. Graph 1 below shows the pronunciation errors made by the Arabic native-speaker students by proficiency levels.



Graph 1: Phonetic Errors Made by The Arabic Native Speaker Students by Proficiency Levels

3.1.2. Pronunciation Errors Made by The French Native Speaker Students by Proficiency Levels

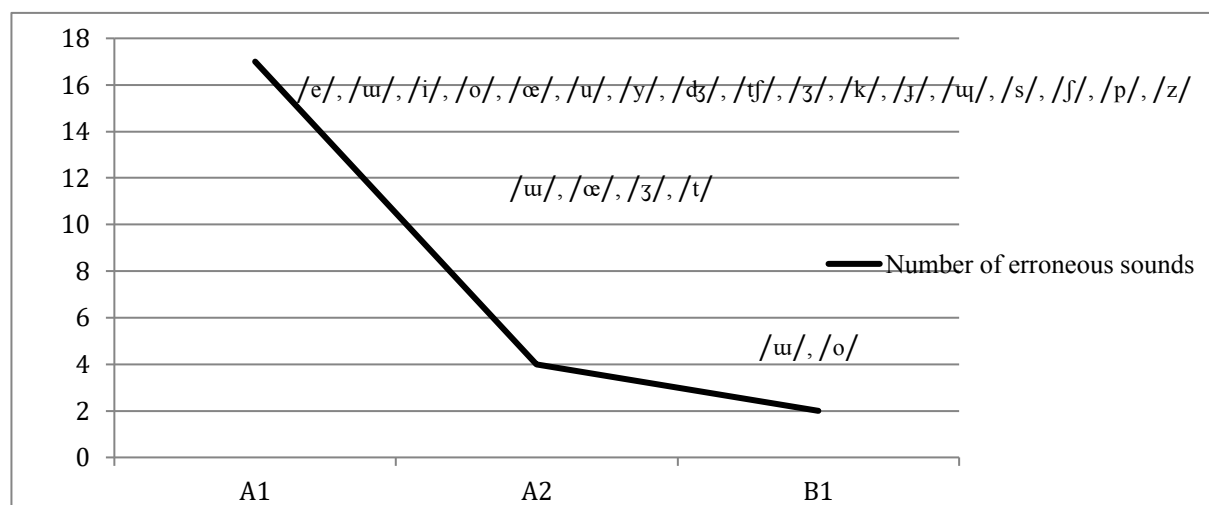
P5, who was a Guinean male student, could not pronounce the vowels /ʊ/, /i/, /e/, /u/, /œ/, /o/, and /y/ correctly at the A1 level. For the consonants /dʒ/, /tʃ/, /s/, /ʒ/, /ʒ/, /p/, and /k/, the student used the replacements sounds /k/, /ʃ/, /z/, /dʒ/, /ʒ/, /b/, and /g/ at the same level. The vowel /ʊ/ and the consonants /t/ and /ʒ/ were incorrectly pronounced at the A2 level by the student. At the B1 level, only the vowel /ʊ/ was pronounced incorrectly.

P6, who was a Nigerian male student, could not pronounce the vowels /ʊ/, /y/, and /e/ and the consonant /tʃ/ correctly at the A1 level. The student did not mispronounce any sound at other levels.

P7, who was a Burundian male student, could not pronounce the vowels /ʊ/, /œ/, and /y/ and the consonants /dʒ/, /s/, /tʃ/, and /tʃ/ at the A1 level. Only the vowel /ʊ/ was incorrect at the A2 level. At the B1 level, the sounds that were incorrectly pronounced were /ʊ/ and /œ/.

P8, who was a Chadian male student, could not pronounce the vowels /e/, /œ/, /ʊ/, /y/, and /u/ and the consonants /z/, /dʒ/, /tʃ/, /ʃ/, /ʒ/, /s/, and /tʃ/ at the A1 level. Only the vowel /œ/ was incorrect at the A2 level. The student did not make any pronunciation errors at the B1 level.

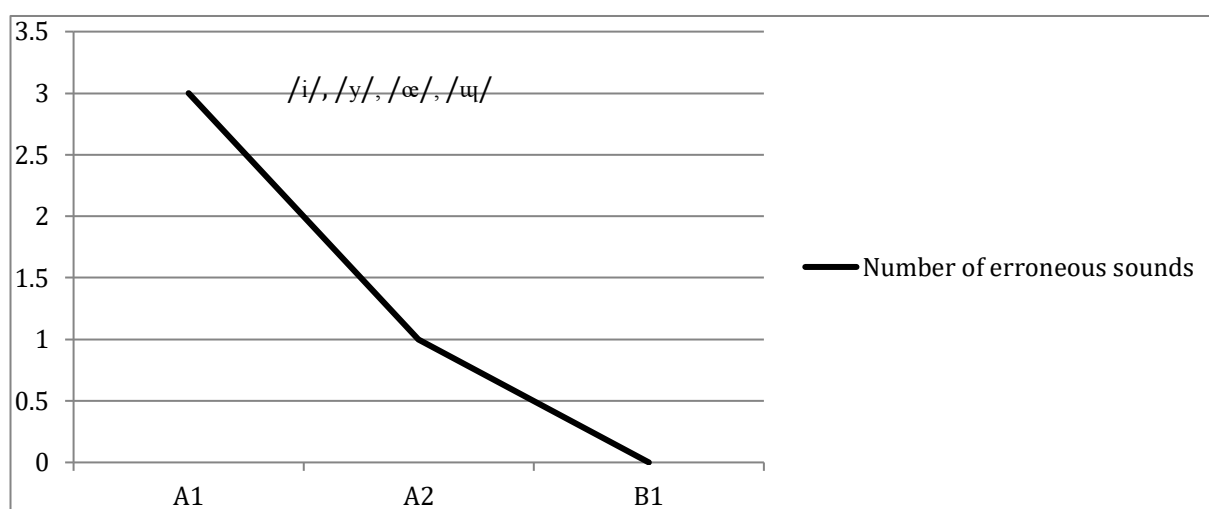
Graph 2 below shows the pronunciation errors made by French native-speaker students by proficiency levels.



Graph 2: Phonetic errors made by the French native speaker students by proficiency levels

3.1.3. Pronunciation Errors Made by The Mongol/Kazakh Native Speaker Student by Proficiency Levels

P9, the only Mongolian male student, could not pronounce the vowels /i/, /y/, and /œ/ and the consonant /w/ at the A1 level. The student did not make any pronunciation errors at the subsequent levels. Graph 3 below shows the pronunciation errors made by the Mongolian/Kazakh native-speaker student by proficiency levels.

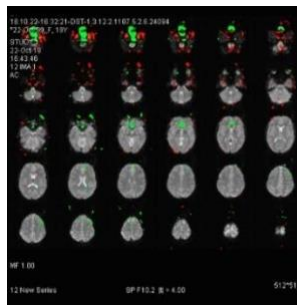
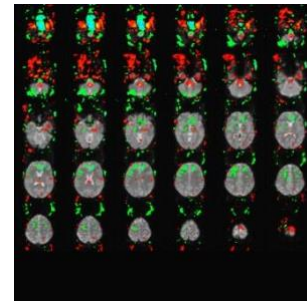


Graph 3: Phonetic errors made by the Mongolian / Kazakh native speaker student by proficiency levels

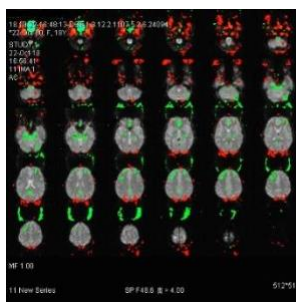
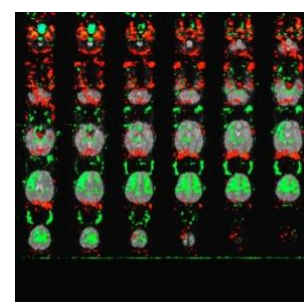
Second research question: To answer this question, two fMRI images were taken. The first image was taken at the end of the A1 level before the implementation of the devised action plan. The second image was taken at the end of the B1 level after the implementation process.

3.2.1. The 1st and 2nd fMRI Images of the Arabic Native Speaker Students

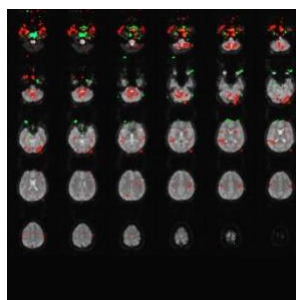
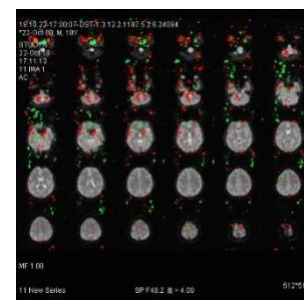
In the first fMRI image of P1 [Figure 1, P1 1st Test] mild involvement was detected both in the bilateral medial frontal and left FEF areas of the brain. In the second image [Figure 2, P1 2nd Test], brain involvement was observed in the bilateral FEF, bilateral superior frontal, bilateral occipital, and bilateral cerebellar areas.

Figure 1. P1 1st TestFigure 2. P1 2nd Test

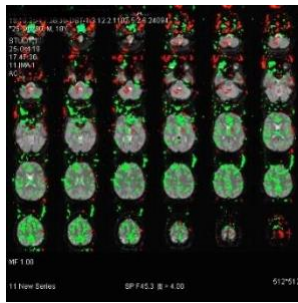
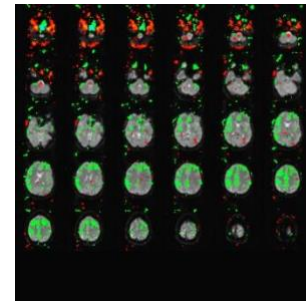
In the first *f*MRI image of P2 [Figure 3, P2 1st Test], involvement was detected in the bilateral superior frontal and right FEF areas of the brain. In the second image [Figure 4, P2 2nd Test], brain involvement was observed in the bilateral superior frontal, bilateral medial frontal, bilateral FEF, bilateral Broca's, cingulum, bilateral occipital, and bilateral cerebellar areas.

Figure 3. P2 1st TestFigure 4. P2 2nd Test

In the first *f*MRI image of P3 [Figure 5, P3 1st Test], mild involvement was detected in the right FEF area of the brain. In the second image [Figure 6, P3 2nd Test], brain involvement was observed in the bilateral superior frontal, bilateral medial frontal, bilateral FEF, bilateral Broca's, cingulum, bilateral occipital, and bilateral cerebellar areas.

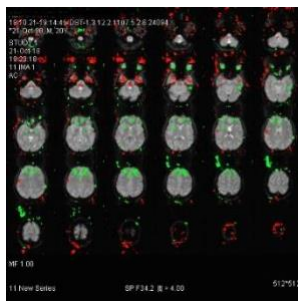
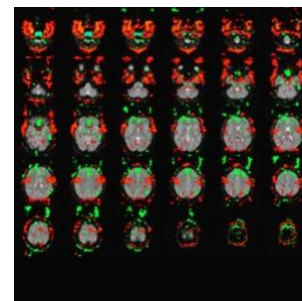
Figure 5. P3 1st TestFigure 6. P3 2nd Test

In the first *f*MRI image of P4 [Figure 7, P4 1st Test], brain involvement was detected in the bilateral medial frontal, bilateral superior frontal, bilateral FEF, bilateral Broca's (right dominant), cingulum, bilateral superior temporal, and bilateral occipital areas. In the second image [Figure 8, P4 2nd Test], brain involvement was observed in the bilateral medial frontal, bilateral superior frontal, bilateral FEF, right Broca's, bilateral superior temporal, bilateral occipital, cingulum, and bilateral cerebellar (mild) areas.

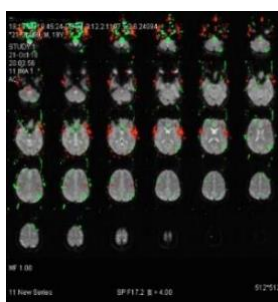
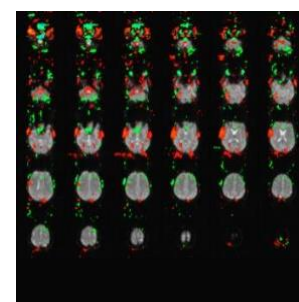
Figure 7. P4 1st TestFigure 8. P4 2nd Test

3.2.2. The 1st and 2nd fMRI Images of the French Native Speaker Students

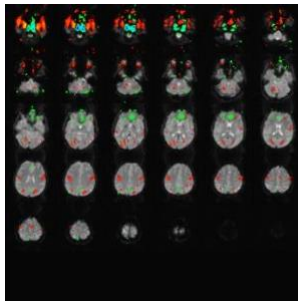
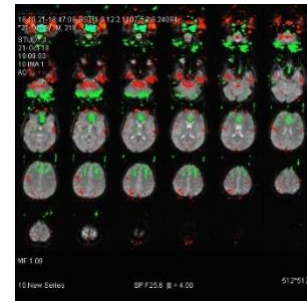
In the first fMRI image of P5 [Figure 9, P5 1st Test], involvement was detected in the bilateral superior frontal, bilateral FEF, and right Broca's (mild) areas of the brain. In the second image [Figure 10, P5 2nd Test], brain involvement was observed in the left superior frontal, bilateral FEF, right Broca's, bilateral occipital, and bilateral cerebellar areas.

Figure 9. P5 1st TestFigure 10. P5 2nd Test

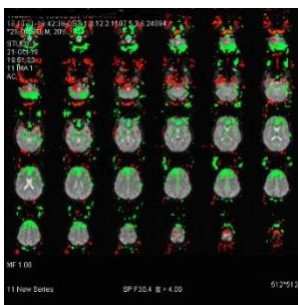
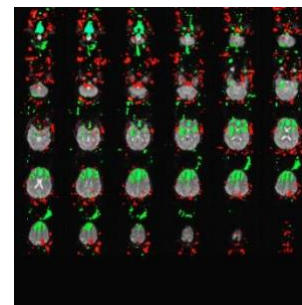
In the first fMRI image of P6 [Figure 11, P6 1st Test], mild brain involvement was detected both in the bilateral superior frontal and the bilateral FEF areas. In the second image [Figure 12, P6 2nd Test], brain involvement was observed in the bilateral superior frontal, bilateral FEF, right Broca's, bilateral occipital, and bilateral cerebellar areas.

Figure 11. P6 1st TestFigure 12. P6 2nd Test

In the first fMRI image of P7 [Figure 13, P7 1st Test], involvement was detected in the bilateral medial frontal, bilateral superior frontal, bilateral, FEF, and right Broca's (mild) areas of the brain. In the second image [Figure 14, P7 2nd Test], brain involvement was observed in the bilateral medial frontal, bilateral FEF, bilateral Broca's, bilateral occipital, and bilateral cerebellar areas.

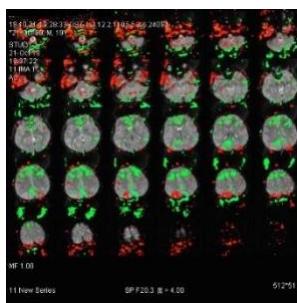
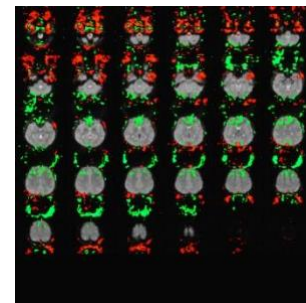
Figure 13. P7 1st TestFigure. 14 P7 2nd Test

In the first fMRI image of P8 [Figure 15, P8 1st Test], involvement was detected in the bilateral medial frontal, bilateral superior frontal, bilateral FEF, and left Broca's areas of the brain. In the second image [Figure 16, P8 2nd Test], brain involvement was observed in the bilateral medial frontal, bilateral superior frontal, bilateral FEF, left Broca's, bilateral occipital, and bilateral cerebellar areas.

Figure 15. P8 1st TestFigure 16. P8 2nd Test

3.2.3. The 1st and 2nd fMRI Images of the Mongolian/Kazakh Native Speaker Student

In the first fMRI image of P9 [Figure 17, P9 1st Test], involvement was detected in the bilateral medial frontal, bilateral superior frontal, bilateral FEF, left Broca's, cingulum, bilateral superior temporal (mild), and bilateral occipital areas of the brain. In the second image [Figure 18, P9 2nd Test], brain involvement was observed in the bilateral medial frontal, bilateral superior frontal, bilateral FEF, bilateral Broca's, bilateral occipital, and bilateral cerebellar areas.

Figure 17. P9 1st TestFigure 18. P9 2nd Test

4. Results

The analyses showed that at the A1 level, Arabic native-speaker students could not pronounce 16 different sounds correctly. Those sounds were /a/, /e/, /u/, /i/, /o/, /æ/, /u/, /y/, /dʒ/, /tʃ/, /ʒ/, /s/, /ʃ/, /p/, /k/ and /w/. At the A2 level, 7 sounds were incorrectly pronounced. Those sounds were /u/, /o/, /u/, /y/, /e/, /z/ and /p/. At the B1 level, the number of incorrectly pronounced sounds was 6. Those sounds were /u/, /æ/, /u/, /i/, /p/ and /w/.

At the A1 level, French native-speaker students could not pronounce 17 sounds correctly. Those sounds were /e/, /u/, /i/, /o/, /œ/, /w/, /y/, /dʒ/, /tʃ/, /ʒ/, /k/, /j/, /s/, /ʃ/, /p/, /z/, and /w/. At the A2 level, 4 sounds were incorrectly pronounced. They were /u/, /œ/, /ʒ/, and /t/. At the B1 level, the students mispronounced only two sounds which were /u/ and /o/. The Mongolian student did not make any pronunciation errors at the subsequent levels.

The fMRI signal in the frontal lobes and the Broca's area was generally more marked in the first fMRI images of the students who were native speakers of French compared with the students whose mother tongue was Arabic. Among the Arabic native-speaker students, only one student (P4) was found to have a higher fMRI signal than the students whose mother tongue was French. In that student, a signal was observed in the bilateral superior temporal, cingulum, and bilateral occipital areas which was not observed in the French native-speaker students.

All second fMRI images showed increased signals in the cerebellar region due to neurovascular connections. The increase is less in P4 than in the other students, whose first fMRI image showed the highest signal. This is because he was not able to attend the activities regularly. Therefore, the pronunciation mistakes he made during the read-alouds and in speaking persisted. In the first fMRI images, a signal in the occipital region was observed only in two students (P4, P9), while in the second test, all students showed a signal increase in the same region. In the second images, the most significant signal increase was seen in P1, P2, P3, and P6.

5. Discussion

In this study, the pronunciation mistakes made by the Arabic native speakers in the Turkish vowel sounds of /o/, /œ/, /u/, and /y/ are due to the limited number of vowels in Arabic (Adalar Subaşı, 2010; Demirci, 2015; Doğan, 2007; Karatay et al., 2019; Şengül, 2014). Also, the absence of the Turkish consonant sounds /p/, /g/, /w/, /ʒ/, /tʃ/, and /v/ in Arabic caused those sounds to be pronounced incorrectly (Demirci, 2015; Doğan, 2007). It was found in the previous studies (Adalar Subaşı, 2010; Akkaya & Gün, 2016; Alshirah, 2013; Beydilli Kaya, 2019; Biçer, 2017; Demirci, 2015; Erdem et al., 2015; Erten Dalak & Mercan, 2017; İnan & Öztürk, 2015; Kaplan, 2018; Kara, 2010; Morali, 2018; Okatan, 2012; Şengül, 2014; Tuzlukaya, 2019; Ünal, Taşkaya & Ersoy, 2018; Yılmaz & Şeref, 2015) that Arabic native speaker students employed negative transfer when there were sounds that were missing in their own language or when they had difficulty perceiving or distinguishing new sounds, by replacing those sounds with similar sounds in their language. Such problems, however, can be reduced by using activities such as listening and distinguishing (Çerci, 2014; Er, Biçer & Bozkırlı, 2012; Özmen, Güven & Dürer, 2017) which were used in this study. Thanks to these activities, the phonetic errors made by the students began to decrease when the students reached the A2 level.

Throughout the study process, it was observed that the phonetic errors made by Arabic native-speaker students were more persistent. The significant increases observed in each of the brain images of those students also indicated that they had no previous knowledge of the Turkish sound system at the A1 level and thus experienced more difficulties in terms of pronunciation than other students. The eye movement signals related to the motor process of reading in the frontal lobes and Broca's area were less common in Arabic students than in other students. The reason for this may be explained through the differences between Turkish and Arabic in terms of the alphabet and reading direction which is from left to right in Turkish and from right to left in Arabic.

During the reading process, the difference in the reading direction in Arabic causes the perceptual distance to extend more to the left (Jordan et al., 2014). The differences in eye movements and reading motor processes in students whose mother tongue was Arabic and the lack of a signal in brain involvement areas also supported these findings. At the A2 level gains were observed in terms of word recognition, letter recognition, motor processes in reading, eye movements, and following writing signals in the brain as the students' knowledge of phonological encoding and pronunciation skills increased.

Except for the pronunciation of some fossilized sounds, the sound errors made by French native-speaker students decreased. These students also achieved the most successful results in terms of pronunciation, motor processes of reading, and frontal eye movements. This may be explained first by the fact that French native-speaker students were learning their third language while Arabic native-speaker students were learning their second language which gave them leverage in terms of language learning experience and strategies. Secondly, French native-speaker

students had the advantage of learning another language that used the same alphabet and direction of reading which shortened the time of eye movement and led to faster reading (Rayner, 1978).

In student P9, whose mother tongue was Mongolian/Kazakh, phonetic errors completely disappeared at the end of the A1 level. These results may be explained by the existence of similarities between the syntax and morphological and phonetic features of Mongolian/Kazakh and Turkish (Albayrak, 2010; Biçer, Çoban & Bakır, 2014) as similarities and common features between Turkish and its dialects also facilitate language learning (Baytok, 2018; Biçer & Alan, 2019). This participant's higher Turkish readiness and similar pronunciation skills compared with those of other students had activated the occipital region in his first brain image and openly revealed the relationship between the occipital region and pronunciation.

Signal increases were observed in the occipital region in all students who in general started to understand what they read as a result of improvement in their knowledge of Turkish pronunciation. Thus, it may be said that occipital involvement in the brain is associated with reading and cerebellar involvement is associated with a decrease in pronunciation errors. The finding that one of the students (P4) continued to have pronunciation errors during speaking because of lesser cerebellar involvement compared with other students also supports this.

Increasing learners' sound awareness along with speaking skills leads to a decrease in phonetic errors and contributes to the development of the motor processes of reading, tracking writing, and eye movements. The pronunciation skill should be one of the primary goals from the beginning of language learning because it is the key to accurate listening comprehension and speaking skills.

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The Impact of the Cognitive Conflict Approach on the Elimination of the Misconception in Square Root Numbers

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Abstract

This study aims to determine the effect of the cognitive conflict approach on the elimination of misconceptions in square root numbers. For this purpose, this study was conducted with 8th-grade students of a secondary school in a region of Turkey. A three tiered diagnostic test was used to determine the impact of the 5-step cognitive conflict approach in the study. This test was used as a pre-test before applications and the same test was used as a post-test after applications in the same class. The test results of the students were divided into 4 groups called "misconception", "lack of knowledge", "lack of confidence", "scientific knowledge", and these groups were also divided into categories (A, B, ...). 5-step cognitive conflict approach made some transformations between categories. The greatest transformation was the transformation of misconceptions into scientific knowledge. However, it was seen that some misconceptions (B category) continued after the applications. In light of these findings, it is suggested that teachers pay attention to the mathematical language and mathematical representations they use during instruction. Moreover, the topic of root numbers should definitely be explained using the Pythagorean Theorem, and the guidebooks should be revised accordingly.

Keywords: Square Root Numbers, Misconceptions, Three Tiered Test, Cognitive Conflict Approach, Secondary School Mathematics

1. Introduction

Ancient Greek mathematics has reached today's mathematics with revolutionary discoveries and developments. The Pythagorean schools in Croton have shaped history with their work in mathematics. In this school, the theorem was proved that "the square of the hypotenuse length of a right triangle is equal to the sum of the squares of the lengths of the other sides." Until then, those who could express all lengths with rational numbers thought how to express the length of the hypotenuse in a right triangle with right sides 1 unit with the proof of this theorem (Baki, 2014: p.33). In fact, if the length of the sides in a right triangle is 1 unit, the hypotenuse length could not be explained by any of the types of numbers they knew. They called this new type of number that emerged from discussions "irrational numbers," which contradicts reason and logic (Sertöz, 2002; Bingölbali & Özmantar, 2010: p. 12). Today, these numbers, which are also referred to as root numbers, for example, $\sqrt{2}$ the number 1.41421... have infinite digits and $\sqrt{x^2}$ is defined as $= |x|$. In the MEB (Ministry of Education) textbook (Böge & Akıllı,

2019), the square root calculation begins by finding the side lengths of squares and comparing them to their areas. Then the square root operation continues with the process of figuring out which number is the square of a non-negative number. Irrational numbers, which mathematicians struggled with in ancient times, are topics students still have difficulty understanding today. Bagni (2000) surveyed high school students between 16 and 19 and attempted to identify their errors in his study. As a result of this study, it has been observed that students have errors such as $\sqrt{a+b} = \sqrt{a} + \sqrt{b}$ and $\sqrt{x^2} = x$. In a study by Crison (2012), when asked about the value of $\sqrt{32}$, students gave the answer $4\sqrt{2}$. When asked about the value of $\sqrt{16}$, they answered ± 4 . Roach, Gibson, and Weber (2004) asked first-year university students about the value of $\sqrt{25}$, most of the students answered $\sqrt{25} = \pm 5$. They attributed the reason for students' misconceptions on this subject to the frequent expression; if $x^2 = 25$, $x = \pm 5$ in algebra textbooks. Negative root numbers ($-\sqrt{25}$) become complete chaos for students who think this way. It turns out that there are other misconceptions about radical expressions among both students and teacher candidates. According to Sirotic (1998), some prospective mathematics teachers have difficulty understanding which number $\sqrt{5}$ can be equal to or estimating between which numbers it lies (cited in Duatepe-Paksu, 2008). In this case, Sirotic and Zazkis (2007) suggest seeing the value of $\sqrt{5}$ on the number line using the Pythagorean theorem.

As can be seen, the ongoing errors in root numbers continue to this day, and the search for pedagogical solutions continues. There are several paths that the teacher should take. One of these ways, the didactic approach (Swan, 2001), is that the error made by the student is communicated directly to the student, and the teacher corrects the error. Thus, if there is an error, an attempt is made to correct it. Another approach is cognitive conflict (CC) (Simon, Tzur, Heinz & Kinzel, 2004). In this approach, the student notices his error in the questions asked by the teacher. The student, noticing the discrepancy and contradiction between his previous answer and his new answer, finds the answer through reflection and reasoning and moves away from his error with his internal calculation. The student's error or misconception is discussed in class and turned into an advantage (Zembar, 2008). The only way to prevent a permanent misconception is to discuss and communicate the misconception and to each other. Although the issue of dealing with misconceptions in class is controversial, this problem should be discussed and resolved in class without exposing or offending students (Bingölbali & Özmantar, 2010, p.23). By discussing and eliminating misconceptions in the classroom, the existing misconceptions can be corrected, and possible misconceptions can be prevented. If the teacher starts a new topic before revealing and eliminating the misconceptions, the student will not be aware of the mistake; maybe student will transfer student's mistake to the new topic and even make new mistakes. Therefore, when errors are detected in students during teaching, they should be intervened immediately, and these errors should be eliminated as soon as they are detected. For this reason, this study, which aims to eliminate some critical misconceptions about root numbers, is considered an original and important study in terms of the approach and activities it offers.

The study investigated what kind of situation arises when a teacher who tries to eliminate the misconceptions about square root numbers in class using a didactic approach instead tries to eliminate the misconceptions using the CC approach. For this, cognitive conflict approach was used and activities suitable for this approach were designed. The research question is: What is the effect of the CC approach in overcoming misconceptions related to square root numbers?

1.1 Theoretical Framework

In the "CC" theory presented by Festinger in 1952, he mentions that man tends to be always consistent. According to Festinger's CC theory, "If one belief, knowledge, or attitude requires the opposite of another belief, knowledge, or attitude that a person holds, there is a CC between those two beliefs, knowledge, or attitude. According to this theory, since such CC's are stressful situations, the person will be motivated to eliminate this conflict" (Kılınç & Torun, 2011: p.4). For example, if a person acknowledges another person as very good and later witnesses an evil committed by this person he knew as good, he begins to experience CC.

CC is based on the theory of the constructive approach. One of the pioneers of cognitive structuralism, Piaget, explains learning in adaptation, assimilation, and balancing processes. If the new information does not conflict with the individual's prior knowledge, it is accepted, and a new cognitive balance is formed. If the new information contradicts prior knowledge, confusion, an imbalance occurs because the new information cannot be integrated

into the existing structure. The individual strives to eliminate this imbalance. By adapting to this situation, he understands that he is confronted with new learning and creates a new cognitive structure (Gelebek, 2011: p.56).

Hewson and Hewson (1984) defined CC as one of the classical models of conceptual change strategies. CC is an important stage of conceptual change proposed by Posner et al. (Posner, Strike, Hewson & Gertzog, 1982). Posner et al. (1982) argue that learning begins with a need and occurs when people are unsatisfied with their existing thoughts. The student experiences dissatisfaction when the student finds that the information student believes to be true is inconsistent with scientific knowledge. This disturbing situation in the student turns into a conflict. The desire to get rid of this situation prompts the student to research and learn. However, the students' willingness to deal with CC and find a solution is not uniform. It is difficult for all students to reach a significant CC (Chan, Burtis & Bereiter, 1997). This is because each student's alternative conceptions are different, and student self-management and diversity limit the transition from one body of knowledge to another, i.e., conceptual change. To overcome misconceptions, conceptual change strategies should make students understand that their concepts are wrong. For this reason, creating CC is an essential prerequisite for realizing conceptual change (Lee, Kwon, Park, Kim, Kwon, & Park, 2003). Posner et al. (1982) listed the four steps of the teaching method CC: 1) creating a conflict, 2) elaborating the conflict, 3) presenting the new idea, and 4) showing that this new idea works. Limon (2001) listed the steps as 1) conflict building with abnormal data, 2) using analogies to force students to change, and 3) collaborative learning to promote discussion. Lee et al. (2003) explain the steps of CC as follows: 1) the introduction is made through the presentation of a CC, 2) the conflict is revealed through demonstration activities that involve an assimilation and accommodation process, and 3) the resolution is concluded with a discussion. According to Baser (2006), learning with CC is done as follows: 1) activating alternative concepts in students, 2) presenting situations that cannot be explained by existing concepts, 3) creating CC with abnormal situations, 4) introducing new concepts that are needed, 5) making students actively build knowledge, 6) students interact with each other to share their ideas about abnormal situations, and 7) trying to see if these ideas help solve the problem that may occur in the same way in the future. Mufit, Festiyed, Fauzan, and Lufri (2018) designed the prototype of CC-based learning. This design includes 1. Activation of conflicts (prejudice), 2. Presentation of CC, 3. Discovery of concepts, and 4. Reflection. Yaman (2013) applied the CC approach in 6 steps. 1. Activation of Misconception, 2. Presentation and Acquisition, 3. Deepening the Conflict, 4. Presentation of Theoretical Information, 5. Extension / Expansion of the Concept, 6. Conclusion – Roundup. Okumuş (2022) used the CC approach in 5 stages. These:

1. Misconceptions are revealed and exhibited
2. Cognitive conflict is created. By giving contradictory examples of each mistake, the student is provided to experience conflict.
3. The reasons for the mistake are mentioned and scientific information is explained. In doing so, the concept change text, the rebuttal text, etc. techniques can be used.
4. Whether the error persists is tested with other examples. If the error continues, it is returned to the second stage and a contradiction is created.
5. A conclusion is drawn and an evaluation is made.

1.2 Studies carried out

Creating CC is difficult and may not produce the same result for every student. Zohar and Aharon Kravetsky (2005) investigated whether the effect of CC on conceptual achievement changes when students at different academic levels use different learning strategies. The result of the study was that students with high academic achievement benefited from the CC teaching method, while the direct teaching method hindered their progress. In contrast, students with low academic achievement benefited from the direct teaching method, while the CC method hindered their progress. In other words, the CC method produced different results for students with various academic performances. There are some difficulties and limitations related to CC (Chan, Burtis, & Bereiter, 1997; Demastes, Settlage, & Good, 1995; Dreyfus, Jungwirth & Eliovitch, 1990; Limon, 2001; Zohar & Aharon-Kravetsky, 2005). Many of the difficulties associated with implementing the CC strategy are closely related to the complexity of the factors that affect conceptual learning in the classroom context. First, the success of the CC approach depends mainly on the individual student to identify and resolve the conflict (Limon, 2001). The issue here is that intellectually less gifted students may not recognize the conflict and that some of those who do recognize it may not be able to overcome it even if they do (Planinic, Krsnik, Pecina & Susac, 2005). Second,

students are often reluctant to give up the alternative ideas resulting from their own experiences (Chan et al., 1997; Planinic et al., 2005). In addition, scientific concepts are often complex for students to understand because they are not based on their experience (Planinic et al., 2005). Therefore, students who cannot absorb scientific concepts with their experiences may learn inadequately and lack confidence. There are controversial results regarding the effectiveness of CC in learning scientific concepts. According to Zohar & Aharon-Kravetsky (2005), students have superficial disagreements than the more radical changes implied by conceptual change theory. Students' concepts are often distinguished as alternative or scientific concepts in CC. According to this view, some students do not understand the inconsistent phenomena in complex concepts and maintain their alternative concepts (Chabay & Sherwood, 2006). Therefore, in the classical model of conceptual change, the ability of CC to bridge the gap between students' alternative understandings and scientific concepts is limited. In general, CC of the classical conceptual change model has been proposed and presented as a linear, rational, deterministic step and revolutionary (Nussbaum & Novice, 1982).

The CC approach is based on cognitive ideas and seems to be more effective in learning its concepts than the traditional transfer approach (Duit & Treagust, 2003; Posner et al., 1982). Some studies have shown that conceptual change in physics cannot be achieved with traditional instruction alone (Dykstra, Boyle & Monach, 1992; Grayson, 1994; Hake, 1998; Dega, Kriek & Mogese, 2013).

Shahbari and Peled (2015) conducted a study examining the conceptual changes of students using the French fries model to break with the CC strategy. They studied with experimental and control groups. The experimental groups were successful in a realistic modeling situation in which they had first to increase and then decrease the size of a bag of French fries. As a result of this study, it was found that there was a conceptual change, and the changing reference was better understood. Liang (2016) used the CC strategy when teaching the limit topic with graphing calculators. This study enabled students to identify their misconceptions using the graphing calculator to create a CC in limited situations as x approached infinity. As a result of this study, he found that the graphing calculator plays an essential role in forming CC. However, he also pointed out some limitations. First, the CC strategy was not sufficient for conceptual change. No matter how convincing the new evidence appeared, it was difficult to abandon the old thinking. Second, the CC strategy enabled the recognition of misconceptions rather than the construction of new ideas (as with other methods, e.g., multiple representations, analogies). Third, CC is not universally applicable in all teaching situations. In some cases, it works; in others, it does not. For example, graphical representations work better when you are teaching quadratic functions. Fourth, the CC strategy requires more time than traditional methods. Because teachers have limited instructional time, extending instruction for a longer period is difficult. Irawati et al. (2018) used the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model in their study of reducing student misconceptions in algebra with a CC strategy. They applied this model to students, which they had developed using the CC strategy. As a result, they succeeded in minimizing students' errors in addition and subtraction in algebraic expressions using the CC strategy. However, it was found that some students still had misconceptions. Okumuş (2022) found in her study that the 5-stage cognitive conflict approach reduced the misconceptions about percentages. But one student resisted to change the misconception and continued the misconception.

It is a difficult task to eliminate misconception. This has been expressed in studies conducted with CC. CC leads to different results for each student. Nevertheless, learning the concepts of CC based on cognitive ideas seems to be more effective than the traditional transfer approach. Students will find it easier to give up their alternative concepts if they are given confidence and willingness, if they have the opportunity to experience their ideas, and if they see that their new concepts work. In this context, our study aims to investigate the impact of the 5SCC approach in eliminating misconceptions related to square root numbers. There is no previous study on this topic. We think that our study will fill this gap and contribute to teachers and students in eliminating misconceptions.

2. Method

The research is a particular case study that examines the effect of the 5SCC approach on overcoming student's misconception about the square root number. A specific case study is an empirical research method that deals with a current phenomenon within its real-world setting, where the boundaries between the phenomenon and the content at stake are not clear, and is used when there is more than one source of evidence or data (Yin, 1984: 23,

as cited in Yıldırım & Şimşek, 2000). Yıldırım and Şimşek (2000) stated that the unique case study is a method based on "how" and "why" questions that enables the researcher to investigate in-depth a phenomenon or event that the researcher cannot control. In this sense, the case study is an appropriate method for our study of how the 5SCC approach affects misconceptions.

2.1 Study Group

In a secondary school in a region of Turkey, practices were conducted in a class of 20 eighth-grade students and with the mathematics teacher of that class.

2.2 Processing

The necessary permissions for this study were obtained by the Recep Tayyip Erdoğan University Publication Ethics Committee with the decision numbered 2021/239 on 16.11.2021. Root numbers are the first topic of unit 2 of 8th grade. First of all, in 2nd semester 8th grade, radical numbers were explained to the students with the traditional method in a classroom chosen by the teacher at random. Then the Pythagorean theorem was explained. Afterwards, the diagnostic test was applied as a pre-test for this study. Then rooted numbers were explained with the 5SCC approach (Okumuş, 2022) by teacher. Immediately after this application, which lasted 4 lesson hours, the diagnostic test was administered to the students as a post-test.

2.2.1. Data Collection Tool

This study used a three tiered diagnostic test for square root numbers developed by Baki, Güveli & Güveli (2019). The diagnostic test, which includes the following gains, consists of 3 steps. In the first step, the student is asked to choose one of the options, in the second step to explain why they chose that option, and in the third step to indicate whether they are sure of that answer. It is believed that three tiered tests are better at detecting students' misconceptions than one- and two-tiered tests (Baki et al., 2019). Therefore, it was considered appropriate to use this three tiered test to detect misconceptions about square root numbers in this study. For the tier 1, the average item difficulty is 0.66, discrimination is 0.32, and Cronbach's Alpha reliability coefficient is 0.59. For the tier 2, the average item difficulty was 0.58, the discrimination was 0.40, and the reliability coefficient Cronbach alpha was 0.72. For the tier 3, the average item difficulty was 0.56, the discrimination was 0.42, and the reliability coefficient of Cronbach alpha was 0.77.

2.2.2. CC stages

The mathematics course was taught according to the following stages of the 5SCC approach:

- 1) Revealing misconception: In the first step, the misconceptions revealed by the concept diagnostic tests are written on the board. It is not said to which student they belong. E.G., The number closest integer to $\sqrt{23}$ is 22 (The misconception that the square root makes the number smaller).
2. Creation of a Conflict: The teacher creates a cognitive conflict in this step. E.G., If the square root expression makes the number smaller, then $\sqrt{1} < 1$ or $\sqrt{\frac{1}{4}} < \frac{1}{4}$. But we know that this is not so. There is a contradiction here.
- 3) Reasons for the error are given, and scientific information is explained. E.G., It is explained between which two integers $\sqrt{23}$ lies.
- 4) More examples are used to test whether the error persists or not. If the error persists, the teacher returns to the second step, generating a conflict. E.G., It is asked what two integers $\sqrt{23} + \sqrt{2}$ are in between. If the false assumption persists;
E.G.: $\sqrt{23} + \sqrt{2} = \sqrt{25}$. If it is true, then $\sqrt{16} + \sqrt{9} = \sqrt{25}$. But we know that $\sqrt{16} = 4$, $\sqrt{9} = 3$ and $\sqrt{25} = 5$ ($7=4+3$). There is a conflict here.
- 5) The conclusion is drawn, and the evaluation is made.

Concerning the course, at no time are negative comments made about what students say or think. This approach aims to enable students to find the correct concept by pointing out the contradictions in their alternative concepts.

2.4. Data Analysis

The test on the square root number were evaluated and analyzed according to the categories indicated in the following table.

Table 1: Diagnostic test evaluation categories

Tier 1	Tier 2	Tier 3	Categories
True	True	I am sure	A
True	False	I am sure	B
False	False	I am sure	C
True	False	Not sure	D
False	False	Not sure	E
False	True	Not sure	F
True	True	Not sure	G
False	True	I am sure	H

In the literature, the A category is called "scientific knowledge", the B category is called "false positives", "misconception" or "true respond with false reason", the C category is called "misconception", the D, E, F categories are called "lack of knowledge", the G category is called "lack of confidence", "lack of knowledge" or "lucky guess", the H category is called "false negatives", "misconception", "false respond with true reason" or "lack of knowledge" (Kırbulut & Geban, 2014; Çiğdemöğlu & Arslan, 2017; Bozdağ, 2017; Bulut, Güveli & Güveli, 2021). In this study, the A category was called "scientific knowledge", the B and C categories were called "misconception", the D and E categories were called "lack of knowledge", the G category was called "lack of confidence". Since there were no students answer in the F and H categories, these categories were not taken into consideration.

The pre-post test results were compared with the percentages and frequencies of the assessment categories. Students were coded as S1, S2,...

3. Results

Three tiered test administered to students before and after the activities using the 5SCC approach. According to the test results, all categories were divided into 4 groups as scientific knowledge, misconception, lack of confidence, lack of knowledge and lack of confidence. The percentages and frequencies of these groups according to the pre-post test results are given in Table 2.

Table 2: Pre-post test results according to the groups

Items	Scientific knowledge(A)		Misconception (B, C)		Lack of knowledge(D,E)		Lack of confidence G	
	Pretest	posttest	Pretest	posttest	Pretest	posttest	Pretest	posttest
1	18 (90%)	19 (95%)	1 (5%)	-	1 (5%)	-	-	1 (5%)
2	18 (90%)	19 (95%)	1 (5%)	-	1 (5%)	1 (5%)	-	-
3	19 (95%)	19 (95%)	1 (5%)	-	-	-	-	1 (5%)
4	19 (95%)	19 (95%)	-	-	1 (5%)	1 (5%)	-	-
5	19	19 (95%)	-	-	1 (5%)	-	-	1 (5%)

	(95%)							
6	14 (70%)	17 (85%)	2 (10%)	-	-	3 (15%)	4 (20%)	-
7	16 (80%)	17 (85%)	3 (15%)	3 (15%)	1 (5%)	-	-	-
8	2 (10%)	16 (80%)	13 (65%)	2 (10%)	5 (25%)	2 (10%)	-	-
9	2 (10%)	16 (80%)	15 (75%)	3 (15%)	3 (15%)	-	-	1 (5%)
10	-	19 (95%)	16 (80%)	1 (5%)	4 (20%)	-	-	-

According to the table 2, there is an increase in favor of the post-test in the scientific knowledge group. There is a decrease in favor of the post-test in the misconception group. There is a decrease in favor of the post-test in the lack of knowledge group. The lack of confidence, which was seen only in the 6th question in the pre-test, was not seen in the post-test. However, in some questions (1th, 3th, 5th, 9th) that were not encountered in the pretest appeared. On the other hand, the percentile between the pre-test and post-test did not change in the lack of confidence.

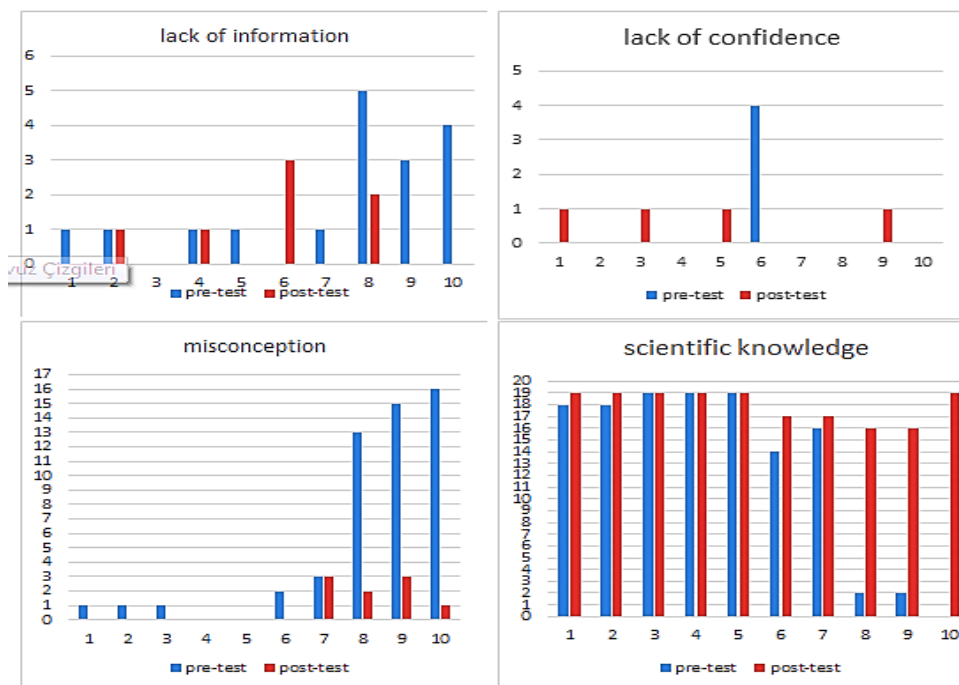


Figure 1. Graphs of pre-posttest results

Table 3 shows the change the groups according to the categories within the group.

	Misconception				Lack of knowledge			
	B		C		D		E	
	pre	post	pre	post	pre	post	pre	post
	5% (1)	-	-	-	-	-	5% (1)	-

Item 2	5% (1)	- -	- -	- -	- -	- -	5% (1)	5% (1)
Item 3	- -	- -	5% (1)	- -	- -	- -	- -	- -
Item 4	- -	- -	- -	- -	- -	- -	5% (1)	5% (1)
Item 5	- -	- -	- -	- -	- -	- -	5% (1)	- -
Item 6	5% (1)	- -	5% (1)	- -	- -	15% (3)	- -	- -
Item 7	- -	15% (3)	15% (3)	- -	- -	- -	5% (1)	- -
Item 8	- -	10% (2)	65% (13)	- -	- -	5% (1)	25% (5)	5% (1)
Item 9	10% (2)	15% (3)	65% (13)	- -	- -	- -	15% (3)	- -
Item 10	5% (1)	5% (1)	75% (15)	- -	5% (1)	- -	15% (3)	- -

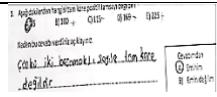
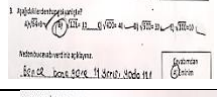
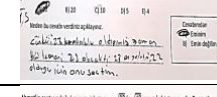
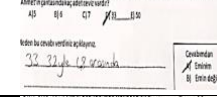

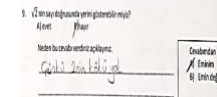
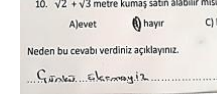
According to the table 3, there is an increase in favor of the post-test in the category B of misconception. This shows that there is an increase in students' true answers with false reasons that they are sure of. In the post-test, there were no students in the category C of misconception. This shows that there are no false answers given with false reasons that students are sure of. There is an increase in favor of the post-test in the category D of lack of knowledge. This shows that there are an increase in students' true answers with false reasons that they are not sure of. There is a decrease in favor of the post-test in the category E of lack of knowledge. This shows that there are a decrease in students' false answers with false reasons that they are not sure of. In the posttest, some transformations caused the increase and decrease between the categories (Appendix A). These transformations frequencies are given in Table 4.

Table 4: The transformation frequencies of the categories

transformation		frequencies	explanation
Pretest	posttest		
C	A	32	positive transformation
E	A	11	positive transformation
C	B	9	positive-inadequate transformation
B	A	5	positive transformation
G	A	3	positive transformation
E	G	2	positive-inadequate transformation
C	G	2	positive-inadequate transformation
C	D	2	positive-inadequate transformation
B	D	1	positive-inadequate transformation
G	D	1	negative transformation
D	A	1	positive transformation

As can be seen from the table 4, category B was transformed into categories A and D. G category, was transformed into categories A and D. Category C was transformed into categories A, B, G and D. Category D was transformed into category A. Category E was transformed into categories A and G. The biggest transformation was from category C to category A. The misconceptions revealed in the pre-test are given in the table below.

Table 5: Misconceptions in the pre-post test

Misconceptions	Test items		Examples of students' papers
	Pretest	Posttest	
1. Determine the root number by the number of digits	1	-	
2. The root number is divisible by 2	2,3	-	
3. The root expression makes the value of a number smaller	6	-	
4. Ignoring the square symbol	7,8,10	-	
5. Adding two separate root numbers under the same root	8,10	8	
6. The numbers that do not go out of the root do not have an exact place in the number line	9	9	
7. Root number cannot be measured	10	10	

The students continued the following misconceptions after the practices. These misconceptions:

- Adding two separate root numbers under the same root.
- The numbers that do not go out of the root do not have an exact place in the number line.
- Root number cannot be measured.

4. Conclusion and discussion

4.1 Change in scientific knowledge

The pre-post test results show that scientific knowledge remained the same for some questions, while it increased sharply for others. The reason for this increase is the conversion from misconception (C, B categories), lack of knowledge (E, D categories) and lack of confidence (category G) to scientific knowledge (A). This transformation shows that SSCC effectively increased the scientific knowledge. Okumuş (2022) found that after the cognitive conflict approach applied to the students, the scientific knowledge levels of the students increased in the posttest. This result is in agreement with our study.

Sirotic and Zazkis (2007), using the Pythagorean theorem, suggest seeing the value of root numbers on the number line. This is the best way to learn root numbers. In MEB textbook (Böge & Akıllı, 2019), we start from area calculations and begin with the example "If the area of a square is 4, then one side is 2." and root numbers are thought of using examples such as $\sqrt{4} = 2$, $\sqrt{9} = 3$ etc.. This gets students thinking that the root is an operation that converts a number to an integer. If it cannot be converted, this leads to a misunderstanding such as "There is no such number, it has no place in daily life, cannot be used, cannot be measured." However, if activities are performed using the Pythagorean Theorem to show that they have a place on the number line, it can be declared that such numbers exist, have a place in daily life, and can be used. We think that SSCC is effective because the activities are done using the Pythagorean Theorem.

4.2 Change in misconceptions

Misconceptions have completely disappeared in category C according to the posttest results. Misconceptions in category C turned into B, G, D and mostly A. However, category B showed a slight increase in favor of the posttest. The reason for this increase is positive-inadequate transformation from category C to category B. In other words, the students turned their false answers with false reasons, which they were sure of, into true answers with false reasons. This shows that although the students gave the true answer to the first tier, they still do not know the reason. This shows that 5SCC activities are effective in eliminating misconceptions in category C, but not in category B.

The following three misconceptions remained at the end of the applications.

- 1) Adding two separate root numbers under the same root
- 2) The numbers that do not go out of the root do not precisely place in the number line.
- 3) Root number cannot be measured

The misconception that two separate root numbers are added under the same root is a common misconception found in some studies (Bagni, 2000; Özkan, 2011, İşleyen & Mercan, 2013; Baki et al., 2019). Many students think that root numbers do not precisely place on the number line because root numbers do not give an exact value (Baki et al., 2019). Perhaps students think root numbers are immeasurable because they do not use them in currencies and weight calculations. Students have difficulty attaching meaning to situations they do not see daily. In this case, students either develop alternative concepts or are unfamiliar with the situation. However, students should know that; if $\sqrt{2}$ indicates a length and $\sqrt{3}$ indicates a length, then $\sqrt{2} + \sqrt{3}$ also indicates a length and is displayed on the number line. An example of a square fabric with a side of 1 meter can be given from daily life. We cut the fabric on its diagonal. We can continue with this length and get $\sqrt{5}$ meters of fabric.

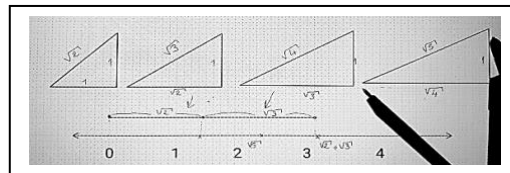


Figure 2: Finding the length of $\sqrt{2} + \sqrt{3}$

Irawati (2018) found that although the CC method minimizes student misconceptions, misconceptions persist for some students. Okumuş (2022) found that the CC approach greatly reduced students' misconceptions, but a student still maintained her misconception. Our study comes to a similar conclusion. Acceptance and internalization is a time-consuming and challenging process. Even if the new knowledge is convincing, it is challenging for students to abandon their old concepts (Liang, 2016). It takes more time for the misconceptions to be eradicated. In the meantime, students should be constantly exposed to and repeat new concepts. Teachers should ensure that students do not have misconceptions and receive good training from the beginning. Cangelosi et al. (2013) point out the importance of language and the notation(s) used in developing conceptual understanding in students. Teachers should pay attention to their expressions and mathematical representations depending on their language in the classroom. If care is not taken, students will either not understand or ignore the root symbol ($\sqrt{\quad}$) in the root number. In this way, the student comes to the brink of misconception due to limited perception and gives up on more challenging topics they will encounter in the future. If there is a misconception, he should look for opportunities to take action and eliminate it. The 5SCC activities, supported by examples from daily life, have not eliminated misconceptions, but they have greatly reduced them.

4.3 Change in the lack of knowledge

The lack of knowledge (category E) was the same in some questions; while it was low in some questions, it (category D) increased in some questions. One of the reasons for this increase is the transformation from misconceptions (C, B categories) to lack of knowledge (category D). Lack of knowledge is a better situation than misconception. Because, in the lack of knowledge, student's current knowledge is not sufficient to solve the problem. This shows that the student is open to change and can be persuaded. However, the student with a misconception is sure of the concept of alternative and it is difficult to give up on the concept that the student is

sure of. This transfer is positive but not adequate. Because, it could not completely eliminate the lack of knowledge. For this, it is recommended to make 5SCC events more interesting. It can become even more interesting if concept cartoons, computer animations, etc., are added to the 5SCC events. In this way, students can acquire knowledge eagerly. The second reason for the increase is the transformation from a lack of trust (category G) to a lack of knowledge (category D). The true answers that the student was unsure of turned into a true answer with an false reason that the student was unsure of. The student's lack of confidence in knowledge caused the student to easily change the knowledge and make mistakes. The reason for the negative transformation was may be that the student answered by rote in the pre-test and made a lucky guess in the post-test. The student did not participate in the activities, did not listen well, was not ready to learn. In the study of Okumuş (2022), in which a similar result was seen, this situation is explained by the fact that the student is go-come living with the CC approach and is not sure of her answer.

4.4 Change in lack of confidence

While the lack of confidence disappeared completely in one question, it appeared in some questions. Misconceptions (category C) and lack of knowledge (category E) in some questions turned into a lack of confidence (category G) in the post-test. The students succeeded in converting the false answers that they were sure or unsure of into true answers. In the study of Okumuş (2022), the misconception and lack of knowledge in the pre-test turned into a lack of confidence in the post-test. This was positive but inadequate. Because, they could not be sure of the answers. Confidence in their knowledge has not been fully formed and they have not fully assimilated the new knowledge. Perhaps, they were perplexed by the conflict they experienced and skepticism. When students change their alternative concepts, they cannot internalize the new concept immediately. For students who change their alternative concepts, it is challenging to internalize new concepts and requires a long process. Therefore, teachers should be stable and encourage the student who replaces alternative concept with the new concept to do more exercises and practice. It will be easier for the student to gain experience through practice and adopt the new concept as they gain experience. The teacher must also encourage and reward the student with words of praise.

It is thought that it can be more effective if concept change texts or concept cartoons are added to the activities carried out with the 5SCC approach. If more activity-rich environments are created and students are given some time, misconceptions and lack of knowledge will be reduced even more.

This study will provide an idea and give researchers a guide for eliminating misconceptions about root numbers and teaching the topic using the approach CC. It will present teachers with a different approach to eliminating students' misconceptions internationally.

The study is limited to the acquisition of which two natural numbers a non-square square root number is between. Future studies may investigate the effect of 5SCC in eliminating misconceptions in various mathematical subjects. This research was not supported by the public, commercial, or nonprofit organizations.

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Appendix A

Pretest and post test results according to the categories

Table A1 shows each student's categories in each item of the test and the transformation of these categories in more depth.

Table A1: Pre-post test results according to the categories

	İtem 1		İtem 2		İtem 3		İtem 4		İtem 5		İtem 6		İtem 7		İtem 8		İtem 9		İtem 10	
	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post	pre	post
S1	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E	A	C	A
S2	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E	A	C	A	C	A
S3	A	A	A	A	A	A	A	A	A	A	G	A	A	A	E	A	E	A	C	A
S4	A	A	A	A	A	A	A	A	A	A	G	A	A	A	A	A	B	A	E	A
S5	B	A	A	A	A	A	A	A	A	A	B	D	A	A	C	A	A	A	C	A
S6	A	A	A	A	A	A	A	A	A	A	A	A	A	A	C	A	C	B	C	A
S7	A	A	B	A	A	A	A	A	A	A	A	A	A	A	C	A	C	A	C	A
S8	E	G	A	A	A	A	A	A	A	A	G	A	E	A	C	A	A	A	D	A
S9	A	A	A	A	A	A	A	A	A	A	A	A	A	A	C	A	C	B	C	A
S10	A	A	A	A	A	A	A	A	A	A	A	A	C	B	C	A	E	A	C	A
S11	A	A	E	E	A	A	A	A	E	G	A	A	A	A	C	A	C	A	C	A
S12	A	A	A	A	A	A	A	A	A	A	A	A	C	B	C	A	C	A	C	A
S13	A	A	A	A	A	A	A	A	A	A	A	A	C	B	C	A	C	A	C	A
S14	A	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	C	A	C	B
S15	A	A	A	A	A	A	A	A	A	A	A	A	A	A	C	A	B	A	B	A
S16	A	A	A	A	A	A	E	E	A	A	A	A	A	A	E	A	C	A	E	A
S17	A	A	A	A	A	A	A	A	A	A	A	A	A	A	C	D	C	A	C	A
S18	A	A	A	A	C	G	A	A	A	A	C	D	A	A	E	E	C	G	E	A
S19	A	A	A	A	A	A	A	A	A	A	G	D	A	A	E	A	C	B	C	A
S20	A	A	A	A	A	A	A	A	A	A	A	A	A	A	C	B	C	A	C	A

The Impact of Cognitive Competence on Critical Thinking Skills: An Educational Science Study with School Counsellors

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Abstract

Critical thinking is an important skill type. It has become a growing focus of attention. Based on the growing interest in critical thinking skills, this research examines the relationship of critical thinking with cognitive competence. Data on sub-questions were collected taking into account the main purpose of the research. This study, which is an educational science study, examines the correlational relationship. In this context, 323 school counsellors participated in the research. The data collected using the data tools used in the research (CC and CT) was examined and the results were reached. Research results show that cognitive competence is an important variable in terms of critical thinking ability. It has been concluded that cognitive competence is an important variable for the ability to think critically. The participants had no significant effect on critical thinking and cognitive competence of gender variables with the classroom. Taking into account this result, recommendations have been developed for the more efficient use of cognitive competence in critical thinking.

Keywords: Cognitive Competence, Critical Thinking Skills, Correlation, School Counsellors

1. Introduction

In recent years, a growing number of countries around the world, especially western ones, have prioritized critical thinking (CT here then) growth at all stages of education settings (Cavus & Uzunboylu, 2009; Miri et al., 2007; Ren et al., 2020; Yang & Chou, 2008). CT is becoming an increasingly important aspect of education both on practical and theoretical aspects. In order to satisfy the demands of a constantly evolving world, school education in the twenty-first century is required to provide students with both domain expertise and twenty-first-century skills such as problem solving, critical thinking and decision-making processes (Kong, 2014, 2015). Hence, in today's ever-changing and demanding environment, students must learn higher-order cognitive skills in addition to building their expertise not only for educational perspectives but also for business demands (Aizikovitsh-Udi & Amit, 2011; Masduqi, 2011). That's why CT skills are essential for academic and successful workplace decision-making, leadership, mindful judgement, career performance, and political-social engagement. As there is an increasing importance of gaining CT skills, CT is not seen as a luxury, rather as a demand that cannot be ignored by educators and policy makers. Students in the twenty-first century must learn knowledge comprehension and critical thinking skills in order to succeed in their education life span. The National Research Council (2012)

(USA) described 21st century skills as vital to the learning process in 2012; one of these skills was cognitive, which involves critical reasoning, imagination, executive functioning, and problem-solving ability (National Research, 2012; Papanastasiou et al., 2019). These higher order reasoning and problem-solving skills, CT skills as well as the ability to collaborate and function efficiently in a team, are important for students' educational development (Şendağ & Ferhan Odabaşı, 2009), they must learn knowledge literacy and critical thinking skills. Given that the most important aim of education is to encourage logical intellectual growth, teaching critical thought includes designing practices and building an atmosphere that promotes this goal (Roy & Macchiette, 2016) as they must deal with the demands of a knowledge-based culture.

1.1 Introduce the Problem

Humans' ability to develop their intellectual potential goes back to the first civilizations where knowledge played a part. Despite its popularity in recent times, CT has been a well-established topic and a controversial area of study across disciplines for a long time. It dates back to the period of Socrates (Popil, 2011). It is based on Socratic questioning which is a thought-centered approach that allows people to strengthen their CT skills and engage in analytical dialogue, resulting in self-directed learning and reflection (Masduqi, 2011; Saiz & Rivas, 2011). Descartes applied Socrates' view of CT, which was inspired by Plato, Democritus elucidating the interactions between cause and effect, which was a theme in essays published by Montesquieu and Locke (Rfaner, 2006; Rimiene, 2002). In the beginning of the last century, CT has been regarded as an aggressive, continuous, and deliberate analysis of a belief or alleged form of knowledge in light of the grounds that justify it and the farthest conclusions to which it leads (Dewey, 1997). A variety of CT skills have been also classified by Bloom's taxonomy of educational objectives based on a triangle that integrates the CT skills in any order (Aviles, 1999).

In line with the National Education Association's [NEA] recommended structure the 4Cs is used to express the competencies: CT meaning ability to reason, consider, analyzed and make sound choices, and solve problems; communication in different ways, contexts, and technologies; deciphering meaning and aiming in various situations; collaboration is characterized as the willingness to collaborate in a dynamic, versatile, and able to accomplish shared goals environment, as well as the ability to share responsibility for collective work and appreciation for team members' individual contributions; creativity is a concept used to define, revise, review, and test proposals in order to develop and optimize problem-solving activities cited in (Widana, 2018). Along with the stated four competences, CT is the far most underlying component to encourage logical academic growth by creating an environment facilitative to meeting the demands of the 21st century workforce (Roy & Macchiette, 2016; Short & Keller-Bell, 2021). Many scholars claim that learning CTS in business is important because these skills are needed to cope with the rising complexity of real-world problems (Page & Mukherjee, 2007).

Higher CT abilities or dispositions are correlated with improved learning outcomes according to observational studies undertaken in educational settings (Ren et al., 2020). Dwyer et al., (2014) argues that CT teaching is becoming particularly relevant as it helps learners to develop the much more complex view of the knowledge they experience and facilitates effective judgment and problem-solving in real-world scenarios. The development of these essential skills is aided by pedagogical methods, which indicates to be integrated and emphasized in the curriculum (Widana, 2018), that bases on CT introduced in the last several decades (Bensley & Murtagh, 2011; Butler, 2012). Based on the constructive approach, it is the process of connecting ones' existing knowledge with new learning and creating their own knowledge and mental models as a result of their own experiences and thinking, CT skills training introduces new educational paradigms by changing instructional approaches from what to think to how to think (Behar-Horenstein & Niu, 2011). Since they reflect the conclusions of other people's thought processes, conventional instructions are virtually worthless for teaching higher-order thinking skills. High-leverage critical-thinking activities (Haber, 2020) provide clear guidance on critical-thinking concepts and strategies, intentional practice experiences to bring certain techniques to use, promoting cross-domain transfer, and empowering learners to perform thinking critically through their own. Altaf (2018) suggests some techniques that aid critical thinking in students include posing open-ended questions helps children to think critically, create an atmosphere in the classroom where students are free to ask questions without fear of being punished by their classmates or teachers and send them real-life instances to make them understand the issue better

1.2 What is Critical Thinking (CT)?

Theorists and educators have offered a number of critical thought definitions. CT is a nebulous term of an overabundance of interpretations and definitions. While there is no unified consensus on what constitutes critical thinking, there is enough overlap among the different meanings to enable a reviewer to progress beyond the definitional level (Halpern, 1993). It is defined as a purposeful, self-regulatory judgement that results in perception, study, assessment and inference (Facione, 1990); a systematic approach to learning (Biggs, 1988); a type of thinking in which people apply criteria and systemic view to their thoughts on a regular basis (Paul, 1993); a self-awareness and reflection on one's own and others' thoughts (Şendağ & Ferhan Odabaşı, 2009); metacognitive process, consisting of a number of sub-skills such as analysis, assessment, and inference (Dwyer et al., 2014); a rational, purposeful, and introspective method of problem-solving (Rudd et al., 2000); the ability to think of a solution to a problem or to create something meaningful or innovative out of nothing (Hwang et al., 2007); reflective and reasonable thinking that is focused on deciding what to believe or do (Ennis, 1985); Individuals' entire repertoire of cognitive tasks focus on a particular object, challenge, or condition (Birgili, 2015) intelligent reflective reasoning, with an emphasis on addressing particular issues (Braus & Wood, 1993).

Although it was conceived by Greek philosophers and has been in use since the time of the Greek Empire (Masduqi, 2011), CT has been the subject of many recent educational implementations. This involves considering not only critical issues within disciplinary fields of history, physics, and mathematics, but also considering the social, political, and ethical complexities of daily life in an increasingly dynamic world (Abrami et al., 2008). Students' participation, self-directed learning, authentic learning, team skill development, problem-solving skills, and interdisciplinary research are all current areas of emphasis (Klegeris & Hurren, 2011) in CT education. In other words, emphasized that students having CTSs can solve problems more effectively (Snyder & Snyder, 2008), become laced with self-judgement and self-criticism, be more efficient in the workforce and in their private lives, the analysis of an argument is to make inferences using reasoning and feel more capable at decision making processes. To Facione (1990), the ideal critical thinker is an open-minded, agile, fair-minded in assessment, truthful in facing personal prejudices, conscientious in making decisions, eager to rethink, consistent about problems, orderly in complicated matters, persistent in finding relevant facts, rational in the application of parameters, and concentrated on questioning.

1.3 Cognitive aspects of CT skills

For decades, educational research (Myers & Dyer, 2006; Pithers & Soden, 2000; Terenzini et al., 1995) and programs have emphasized the development of students' critical thinking skills. The body of evidence in cognitive and learning psychology is vast, and it enables us to recognise CT abilities and cognitive performance. CT is generally described as a set of cognitive skills with different dimensions holding improvements on thinking abilities in gradual and cumulative process of learners (Halpern, 1993). CT, according to psychological perspectives (Abrami et al., 2008), involves a mastery of a set of distinct abilities or cognitive operations such as interpreting, foreseeing, observing, and assessing, as well as dispositions, that can be applied in a number of situations. As a comprehensive collection of cognitive tasks performed by individuals in response to a particular object, challenge, or condition (Birgili, 2015); CT refers to any notable learner cognitive behaviour that takes place in a real-world setting.

With the ultimate aim of developing students' reasoning skills (Osburn & Mumford, 2006), hence, we should learn more about the essence of students' cognitive abilities by defining variables that influence their CT progress. According to Yang and Chou (2008) cognitive capacity or competence has been regarded as a prerequisite for enhancing one's CT skills. A learner's understanding and beliefs about a topic or task, as well as the decisions he or she makes in allocating his/her cognitive capacity will increase his/her level of comprehension (Hollingworth & McLoughlin, 2000). Students with high levels of cognitive ability will organize and self-regulate their own learning plans and skills, which are referred to as CT. Thus, students who can improve their metacognitive abilities to the learning process may have a higher degree of understanding and they will be more qualified to draw correlations to previous experiences (Kängsepp, 2011; Özçakmak et al., 2021). However, according to Zimmerman and Campillo (2003), along with cognitive capacity, other traits such as individual resourcefulness and resilience, as well as motivational beliefs such as self-efficacy and self-regulation, innovative thinking, gaining insights are also essential for proficient CT skills.

Bloom (1956) was one of the first to study the cognitive domain, which emphasizes intellectual outcomes. This domain is further segmented into stages or subcategories by Bloom's taxonomy. He proposes that students advance through six phases of learning in order. As a result of which one stage must be completed before moving on to the next. Roy and Macchiette (2016) argue that, in Bloom taxonomy, knowledge, comprehension, and application are among the lower-level processes, while analysis, synthesis, and evaluation are among the higher-level processes. Moreover, Peter (2012) argues synthesis and evaluation are two ways of thinking that they both involve one to look at pieces and to be considered critically. Evaluation, which is similar to critical thinking, is concerned with making a decision or assessment followed by an analysis of an argument or proposition.

1.4 Cognitive presence and CT skills

At the first stage when we need to make it clear what we mean by presence: Lee (2004) defined presence as “a psychological state in which virtual objects are experienced as actual objects in either sensory or nonsensory ways”. Lee divides it into three domains as physical (interacting with simulated physical structures and worlds that have a genuine relation to their respective real-world counterparts), social (interacting with the representations of other humans linked by technology), and self-presence (within a simulated world, seeing a reflection of one's own true self-either physically embodied or mentally presumed). Similarly, presence is described by International Society of Presence Research as a part or all of an individual's actual experience which is created and mediated by human-made technologies, and part or all of the individual's understanding fails to adequately recognize the technology's position in the experience (Research, 2000). Garrison et al. (1999)'s Community of Inquiry (CoI) paradigm offers theoretical and realistic perspectives on deep and surface learning methods and outcomes are based on critical thinking. Likewise, Lee (2004), Akyol and Garrison (2011) argue that the presence paradigm has three interrelated systemic elements: social, cognitive, and teaching presence. They state that growth of the community's environment and interpersonal interactions are influenced by social presence; the concept of cognitive presence describes the stages of practical inquiry that contribute to the resolving of a problem or question and finally throughout the course of learning, teaching presence offers leadership.

Participants shift actively from understanding the problem or topic to experimentation, incorporation, and implementation through a continuum of realistic investigation known as cognitive presence (Garrison, 2007). According to Breivik (2016), this definition is consistent with Dewey's understanding of CT, and it is definitely important in the discussion of the CoI paradigm, which claims to be compatible with Dewey's account of inquiry and thinking. Dewey, who introduced social-constructivist views of thinking, offered ideas, models, and principles to foster critical thinking growth (Ültanır, 2012). The CT period, according to Dewey, begins with the understanding of a problem and progresses to the creation of concrete hypotheses and a solution through the exploration of applicable experience (Lee, 2014). Within the same line, from the basic investigation to the final CT and problem solving stage, cognitive presence identifies the learning processes and knowledge construction. The concept of cognitive presence reflects higher-order intelligence learning and implementation and is most closely linked to critical thinking (Garrison et al., 1999). Cognitive presence considers how students solve new challenges, evolve in knowledge, and communicate it to their learning environment.

Cognitive presence is explained through the model of critical thinking or practical inquiry model by Garrison et al. (1999) and it is divided by four phases: triggering events, exploration, integration and resolution (Garrison et al., 2001) all which have been illustrated respectively in Table 1 (Akyol & Garrison, 2011; Kovanović et al., 2015; Lee, 2014; Traphagan et al., 2010):

Table 1: Subcategory of Cognitive presence (Akyol & Garrison, 2011; Lee, 2014)

Category	Meaning	Indicators
Triggering event	In this step, a learning process is triggered by a challenge or dilemma, which is usually implemented by the teacher in a formal instructional environment.	Recognizing the problem
Exploration	Students collect knowledge related to the issue or mission at hand through experimentation,	Divergence and exchanging of ideas,

	brainstorming, and other exercises during this process.	
Integration	Students synthesize and merge various pieces of information in this process after collecting an adequate body of information, while remaining selective and filtering out any unnecessary information.	Connecting ideas, inferences, synthesis, creating solutions
Resolution	The final step is the resolution of the initial dilemma, which is usually accomplished by vicarious behavior and hypotheses development in formal education.	Application to real world

1.1. Research Aim

Critical thinking is important in all areas of individual and academic development, but it has also become an extremely important issue for teacher education, which has a significant share in the education of new generations. This research aims to identify the relationship between teacher candidates' cognitive competencies and critical thinking skills. In the context of this basic goal, the research seeks answers to the following sub-questions:

- Do class and gender variables have a significant and shared impact on participants' CTSs?
- Do class and gender variables have a significant and shared impact on participants' CC?
- What are the levels of cognitive competence according to the classrooms and genders of the participants?
- What effect does in-school-training activities have on the development of critical thinking skills?
- How do information sources benefit the critical thinking skills of students?
- What effect does pre-learning have on solving new problems and engaging critical thinking?
- What contributes to the development of critical thinking ability of students that allow them to create solutions which can be applied to other areas in practice?
- What is the level of cognitive competence in critical thinking?

2. Method

This research examines the relationship between cognitive competence and critical thinking skills in terms of various variables. A correlational research model was used in this research for this purpose. Correlational research models aim to determine the existence or degree of variance between two or more variables (Karasar, 2016, Lodico et al. 2010).

2.1 Population and Sample

In this study, a working group was established by a purposeful sampling method to determine the effect of cognitive competence on critical thinking ability. A purposeful sample allows you to explore the subject in depth, helping to identify the relationships that exist on the subject that is intended to be studied (Tarhan, 2015). In this context, 323 school counsellors participated in the research. The group of participants who are the subject of this study group are undergraduate students who receive psychological counselling and guidance education. This working group consists of students of the Department of Psychological Counselling and Guidance of the Faculty of Education at Mustafa Kemal University in Hatay, Turkey, taking into account four different levels of education. Detailed information about the working group is presented in Table 2.

Table 2: Study Group

	Gender		Total	
Class	Male	Female	%	Total
1 st	50	37	26,9	87
2 st	35	16	15,8	51
3 st	56	46	31,6	102
4 st	55	28	25,7	83
Total	196	127	100	323

2.3 Data Collection Instruments

In this study, two different data collection tools were used to collect data. Explanatory information about these data tools is provided:

(a) Critical Thinking Skills Scale (CTSsS); Subjects' affective attitudinal dimension of critical thinking was analyzed by Engagement, Maturity, and Innovativeness Critical Thinking Disposition Inventory (EMI critical thinking disposition inventory) developed by (Roberts, 2003). The instrument has three subscales. Cronbach's alphas for the subscales of the EMI critical thinking disposition assessment were 0.75 for Innovativeness, 0.75 for Maturity, and 0.86 for Engagement.

(b) Cognitive Competence Scale (CCS): Data on students' reports of cognitive presence was collected using a cognitive presence scale. The scale was developed by Almasi and Zhu (2020). The scale has four items.

Following permissions offered by authors, participants were asked to reply to the survey by selecting numbers on a Likert scale ranging from 1 to 5, with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The instruments were distributed via Google Forms.

2.4. Data Analysis

The data collection tools and personal information forms used in this research were delivered to the undergraduate students who received guidance and psychological counselling training included in the working group. Since there was no participant error or biased response that would cause data loss in the data collection tools delivered to the working group, the response rates were 100%. Data obtained from measurement tools were subjected to statistical processing via computer. The analysis and results obtained are presented in tables.

3. Results

Research findings and the sub-questions of the research are presented respectively.

1. Do class and gender variables have a significant and shared impact on participants' CTSs?

To analyse the levels of impact on participants' CTSs according to the classrooms and genders of the participants, Two-Way Analysis of Variance (ANOVA) was performed. The results of the analysis are presented in Table 3.

Table 3: The level impact on participants' CTSs according to the classrooms and genders of the participants

Source	Sum of Squares	df	Mean Square	F	p
Corrected Model	1,841 ^a	7	,263	1,393	,207
Intercept	3850,401	1	3850,401	20392,557	,000
Class	,239	3	,080	,421	,738
Gender	,287	1	,287	1,519	,219
Class * Gender	1,579	3	,526	2,787	,041
Error	59,476	315	,189		
Total	4518,093	323			
Corrected Total	61,318	322			

a. R Squared = ,030 (Adjusted R Squared = ,008)

According to Table 3, class and gender variables seem to have an impact on participants' CTSs. This effect is significant, if not great, on critical thinking skills ($p > .05$).

2. Do class and gender variables have a significant and shared impact on participants' CC?

To analyze the levels of impact on participants' CC according to the classrooms and genders of the participants, Two-Way Analysis of Variance (ANOVA) was performed. The results of the analysis are presented in Table 4.

Table 4: The level impact on participants' CC according to the classrooms and genders of the participants

Source	Sum of Squares	df	Mean Square	F	p.
Corrected Model	3,802 ^a	7	,543	1,111	,356
Intercept	3725,427	1	3725,427	7622,572	,000
Class	,797	3	,266	,543	,653
Gender	,310	1	,310	,635	,426
Class* Gender	1,983	3	,661	1,353	,257
Error	153,952	315	,489		
Total	4486,875	323			
Corrected Total	157,753	322			

a. R Squared = ,024 (Adjusted R Squared = ,002)

According to Table 4, the participants of the classroom and gender variables are subject to participants having no significant effect on critical thinking skills. ($p > .05$).

3. What level is the effect of training-in-school activities on the development of critical thinking skills?

Pearson Correlation Analysis was performed to detect the effect of educational-in-school activities on the development of CTSs. Pearson Correlation Analysis results are offered in Table 5.

Table 5: The level effect of trainings-in-school activities on the development of CTSs

		CTSs	Trainings-in-school activities
Critical Thinking Skills (CTSs)	Pearson Correlation	1	,314**
	Sig. (2-tailed)		,000
	N	323	323

When Table 5 is examined, it is a positive relationship between CTSs and training-in-school activities. The relationship between these two variables shows significance ($p > .05$).

4. What level is the contribution of their CTSs to benefit from different-rich information sources of students?

Pearson Correlation Analysis was performed to detect the effect of critical thinking skills to benefit from different-rich information sources of students. Pearson Correlation Analysis results are offered in Table 6.

Table 6: The level effect of trainings-in-school activities on the development of CTSs

		CTSs	Benefit from different-rich information sources
Critical Thinking Skills (CTSs)	Pearson Correlation	1	,455**
	Sig. (2-tailed)		,000
	N	323	323

When Table 6 is examined, it is a positive relationship between CTSs and benefits from different-rich information sources. The relationship between these two variables shows significance ($p > .05$).

5. What level is the effect of pre-learning to solve new problems and CTSs?

Pearson Correlation Analysis was performed to detect the effect of pre-learning to solve new problems and CTSs. Pearson Correlation Analysis results are offered in Table 7.

Table 7: The level effect of pre-learning to solve new problems and CTSs

			CTSs	Pre-learning
Critical Skills (CTSs)	Thinking	Pearson Correlation	1	,499**
		Sig. (2-tailed)		,000
		N	323	323

When Table 7 is examined, it is a positive relationship between pre-learning to solve new problems and CTSs. The relationship between these two variables shows significance ($p > .05$).

6. What level is the contribution to the development of CTSs to create solutions that can be applied to other areas in practice?

Pearson Correlation Analysis was performed to detect the contribution to the development of CTSs to create solutions that can be applied to other areas in practice. Pearson Correlation Analysis results are offered in Table 8.

Table 8: The level contribution to the development of CTSs to create solutions that can be applied to other areas in practice

			CTSs	To create solutions that can be applied to other areas in practice
Critical Skills (CTSs)	Thinking	Pearson Correlation	1	,575**
		Sig. (2-tailed)		,000
		N	323	323

When Table 8 is examined, it is a positive relationship between creating solutions that can be applied to other areas in practice and CTSs. The relationship between these two variables shows significance ($p > .05$).

7. What level is the effect of Cognitive Competence (CC) on CTSs?

Pearson Correlation Analysis was performed to detect the effect of CC on CTSs. Pearson Correlation Analysis results are offered in Table 9.

Table 9: The level effect of CC on CTSs

		CTSs	CC
CTSs	Pearson Correlation	1	,645**
	Sig. (2-tailed)		,000
	N	323	323

When Table 9 is examined, it is a positive relationship between CC and CTSs. The relationship between these two variables shows significance ($p > .05$).

4. Discussion

Research results show that cognitive competence is an important variable in terms of critical thinking ability. It has been concluded that cognitive competence is an important variable for the ability to think critically. It is a positive relationship between CTSs and training-in-school activities. The relationship between CTSs and training-in-school activities shows significance. Besides the relationship between CTSs and the benefit from various information sources. There is a positive relationship between pre-learning to solve new problems and CTSs. The relationship between these two variables shows significance. It is a positive relationship between creating solutions that can be applied to other areas in practice and CTSs. There is a positive relationship between CC and CTSs. The relationship between these two variables shows significance. The participants had no significant effect on critical thinking and cognitive competence of gender variables with the classroom.

These research findings show that cognitive competence has an effect on critical thinking. Because cognitive competence is an important variable in terms of critical thinking ability. An individual must have the ability to think critically to fully understand the scientific concepts underlying the problem he/she is facing and be able to analyse this problem correctly (Levesque, 2011). In addition, individuals with cognitive competence can use their critical thinking skills more effectively. In general, competencies such as critical thinking, problem-solving, cognitive competence, flexibility and adaptation are very important within the subject area that constitutes this field (Lee & Lee, 2020).

By using learning-teaching processes, the individual who learns can develop their critical thinking skills. In this research, there is a positive relationship between CTSs and training-in-school activities. It is already known that the ability to move and activity-based learning environments are necessary for the development of CTSs (Brookfield et al., 2005). The ability to solve problems is often associated with the processes of CTSs, analytical reasoning and designing decision-making processes. CTSs can solve problems more effectively (Snyder & Snyder, 2008). CTSs strengthens CC along with cognitive creativity (He, 2015). For this reason, CT and CC should be developed through activity-based educational processes. Higher levels of CTSs in individuals are associated with learning in the educational and learning processes (Ren et al., 2020). Therefore, a well-organized learning-teaching process can give students a high level of CTSs. It can be said this situation can be favorable for the development of cognitive competence. Because when individuals receive critical thinking training, they can increase their tendency to think critically and their critical thinking skills. This will also increase their cognitive competence (Murphy et al., 2014).

Teachers and school counsellors who support CT in their classrooms make significant contributions to the cognitive development of students and increase the positive attitude towards CT. When CTSs are regularly used in classes, students' participation in the process of critical thinking tends to increase (Seferoğlu & Akbıyık, 2006). This situation unquestionably reveals the importance of CT activities in the classroom. In addition, ensuring access to rich information resources for the individual plays a beneficial role in the development of the CTSs. The enrichment of information resources that the individual will use and have access to will contribute to the individual's ability to interpret and analyze by improving the existing critical thinking window of the individual. Besides, CTSs and CCs should be developed not only with artificial problems in the school environment, but also with the problems that individuals face in their daily lives (Sternberg, 2003).

5. Suggestions

Since CT is becoming increasingly important in life skills, it is inevitable that a person who is learning will have this skill set. It is necessary to create learning environments where the learner can share and evaluate the thoughts of the individual with others, and to organize learning and teaching activities aimed at understanding the perspectives of others. In particular, learner-centered and group-based learning environments can play a role to help develop the individual in this regard.

CT is the main educational goal of today's educational programs. In the context of this goal, it should be taken into account that individuals with cognitive competence will achieve significant development in terms of CT. In this way, significant progress can be made in the personal and professional development of other learning individuals, such as school consultations, which are the subject of this study.

Individuals who can use CT effectively in their lives are individuals with critical thinking skills and critical thinking tendencies. The cognitive competence of these individuals also differs significantly from other individuals. That is why the acquisition of CTSs and decencies should be among the goals of modern educational programs, and thinking skills should be the main position in the learning process, classroom, learning environments, and learning-teaching processes should be organized accordingly.

6. Limitations

This research is limited to participants' views on cognitive competence and critical thinking skills. The results were reached by taking into account the data collected by the data collection tools used to identify these views. Discussions and suggestions are included using these results.

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A Study on the Perception of Turkish and Syrian Children of Each Other in Preschool Period: "Tell Me About Your Friend"

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Abstract

This paper aims on revealing the perceptions of 5-6-year-old Turkish and Syrian children sharing the same classroom environment in a preschool education institution by use of metaphors. The study was designed in the phenomenology pattern, one of the qualitative research methods, and conducted with 34 Turkish and 22 Syrian children in the 5-6 age group who receive education in the same kindergarten. The study data were obtained through a semi-structured open-ended form and the content analysis method was used in the assessment of the data. The examination of the study data indicates that Turkish and Syrian children expressed several common metaphors such as 'tree, mother, sky, game, toy, playing, cat, mirror, dog'. However, children attributed different meanings to the metaphors they expressed in common. On the other hand, the study determines that Syrian children created more metaphors with positive meanings compared to Turkish children. The study has a very significant purpose in terms of understanding how the preschool-age children of Syrian families living in Turkey perceive their friends in the schools they attend, and how Turkish children perceive these immigrant children in their classes from the perspectives of both sides. Understanding the perceptions of Syrian immigrant children and Turkish children about each other is critical in terms of guiding educators, decision-makers, and policymakers in order to prevent unfavourable behaviours in schools where children study together, create a positive classroom-school climate, and support an intercultural approach for social peace.

Keywords: Immigrant Children, Multiculturalism, Respect for Differences

1. Introduction

The concept of migration is defined as crossing an international border or moving within the borders of a state (International Organization for Migration-IOM, 2009). The migration process results in changes in the homogenous structures of societies and brings the needs and problems of different groups in society such as immigrants, guests, foreign students, and refugees to the agenda. Throughout history, people have migrated or had to migrate for different reasons. These reasons include economic reasons, negative changes in the political structure of the country, security concerns, war, and better living conditions (Çiçekli, 2009; Koçak & Terzi, 2012). Immigration takes place for different reasons and such reasons change the term used to refer to immigrants. Despite the similar appearance of the words refugee, asylum seeker, and immigrant, these terms are different and might

also be confusing. Refugees are defined as people who have to leave their home country in order to escape from negative attitudes, persecution, and political and religious abuse, and are not likely to return (Dalhouse & Dalhouse, 2009; Roxas, 2010). Asylum seekers are defined as people fleeing from persecution or conflict and therefore under international protection (Convention Relating to the Status of Refugees - CRSR, 1951). Refugee applicants are recognized as asylum seekers by the United Nations and can benefit from refugee rights. The term immigrant is considered an umbrella term covering these two groups (Fennelly & Flaherty, 2017).

One of the most significant immigrant crises affecting the international community regarding immigration in the last century has been the refugee crisis in Syria. Following the conflicts that broke out in Syria as a result of the protests called "Arab Spring", Syrians have started to migrate to neighbouring countries since March 2011. The military conflicts experienced resulted in great demographic changes in neighbouring countries, especially in Syria. The statements indicated that a large part of the Syrian population has had to migrate from the country, and therefore there has been a great increase in the number of Syrian refugees in neighbouring countries (Betawi, 2019; Duruel, 2016).

Among the countries neighbouring Syria, Turkey ranks first in receiving the highest number of immigrants. The geopolitical location of Turkey has caused it to host immigrant groups from various cultures for different reasons (İçduygu et al., 2014). As of April 2021, there are 3,670,342 Syrian refugees in Turkey and approximately 47.4% of registered Syrian refugees include children in the 0-18 age group (Ministry of Internal Affairs, Directorate of Migration Management-DGMM, 2021; The United Nations High Commissioner for Refugees-UNHCR, 2021). Adult immigrants tend to be more successful than children in adapting to their new places and creating a safe environment for themselves. Şengül (2019) suggests that the perspectives of children towards the world are affected by their experience of forced migration. A possible outcome of such a situation is that children in the developing age are affected by the sociocultural differences they encounter in their new place of living, the uncertainty of the place they will settle in, and their inability to benefit from health services adequately and this effect is expected to leave traces throughout their lives (Beter, 2006; Şeker & Aslan, 2015). In terms of minimizing such consequences, the inclusion of children from disadvantaged environments into the environments of education starting from the preschool period is of utmost importance in improving their negative situations and their process of adapting to normal life.

Preschool education institutions are multicultural environments where children bring the cultural diversities of themselves and their families. Children are known to be able to notice racial differences from a very young age, they begin to observe racial prejudices in the preschool period, and certain children obtain distinct prejudices by the age of 4-5 (Young et al., 2021). Carlsson-Paige and Lantieri (2005) state that children tend to notice and comprehend differences as part of their natural development in early childhood as they begin to realize their own identities and form a common identity. Divrengi and Aktan (2010) point out that "Who am I?" and "Who are you?" are among the basic questions that children aged 3-6 seek answers to. Therefore, the preschool education environment not only facilitates the child's adaptation to society in a balanced way (Kuru, 2016; Ateş & Şahin, 2021; Haktanır, 2014) but it also offers significant opportunities for the children to get to know different cultures. In this process, they observe the differences and similarities between people and begin to form a unique perception of personal and social identity including distinctive features such as gender, ethnicity, age, and status with an increasing awareness as of birth (Robinson & Diaz, 2006; Nsamenang, 2004). This period also includes the ages when children begin to distinguish between different cultural identities. "Who am I?" and "Who are you?" seem to be among the basic questions that children aged 3-6 seek answers to (Divrengi & Aktan, 2010). Studies also indicate that children begin to distinguish differences in physical appearance (Fontanella-Nothom, 2019; Hear-Garris, 2018), language (Coelho et al., 2018; Singh et al., 2020; Wagner et al., 2014), cultural identity (Mertan, 2011) and social status (Vandebroek, 2021) from a very young age.

Schools are the most significant institutions where children socialize, develop their physical, cognitive, and social processes, and learn social rules and it is the place, especially where immigrant children have the opportunity to be included in society (Frater-Mathieson, 2004; Holloway & Valentine, 2000; Sabah, 2007). Schools play a critical role in the settlement of refugees and asylum-seeking children, the development of their sense of belonging, and their adaptation to the new country (Taylor & Sidhu, 2012). At the same time, schools act as a bridge for immigrant children to carry themselves to the future and interact with society (Rousseau & Guzder, 2008).

Despite the fact that the school environment of the new society in which immigrant children stepped offers a stable and safe environment, the children may have several problems in adapting to the school. Sudden and difficult migration processes they experienced, having different backgrounds and cultural characteristics, and not sharing a common language are various factors that may lead to these problems. The exclusion and bullying experienced by children alienate children and result in a decrease in their educational success (Hart, 2009; Rutter, 2003). The quicker the immigrant children are accepted by the children with whom they share the same class, the better will be their adaptation to the class-school, the manner of explaining themselves, and their academic success (Şeker & Sirkeci, 2015). In a study conducted in Turkey, it was determined that Syrian children who make friends with Turkish children learn Turkish well and have a high level of adaptation to the city they live in (Yalçın, 2017). Brody et al. (2006) conducted a longitudinal study with African and American children and observed an increase in perceived discrimination that resulted in an increase in behavioural problems and depressive behaviours. Another study with African and American children was conducted by Seaton et al. (2009). The relationship between children's perceptions of racial discrimination and racial identity was tested. In this study, racial discrimination is observed to be negatively related to social respect. At the same time, perceived racial discrimination is believed to be related to negative views of society.

As in all other education levels, more support from the host society is needed in preschool education institutions for immigrant children to adapt to the classroom and life. The ability of these children to forget the negativities they experienced is closely related to the attitudes of other children and teachers in their classrooms and other families they interact with (Gabielli & Impicciatore, 2021; Esen, 2020; Gökmen, 2020).

Uzun and Bütün (2016) examined the problems faced by Syrian refugee children in preschool education institutions in Turkey. Accordingly, the conclusion was reached that Turkish families are uncomfortable with the education of immigrant children and their children in the same environment, and teachers do not fully adopt.

Syrian children as their students. Szente et al. (2006) state that in-class experiences and teachers' attitudes influence the adaptation process of refugee students in the United States. Özger and Akansel (2019) observed that the process of exclusion of Syrian children started as a result of the negative perspective of Turkish parents towards immigrant children and that while there was no discrimination between Syrian and Turkish children in the first years of school, Turkish children who were under the influence of their families began to display bad behaviour after a while.

This situation shows that Turkish children and teachers, who are the peers of Syrian children in preschool education institutions, have significant duties in their cultural adaptation of them, the creation of healthy educational environments, the adaptation of children to society, and their language learning. Kuru (2016) states that the examination of developmental characteristics of the preschool period points out that the concept of prejudice has not yet developed, and children are affected by the judgments of their parents, teachers, and the society they live in. Parents consciously or unconsciously convey their own attitudes to their children and negative attitudes and discourses towards individuals from different ethnic origins may be taken as an example by children (Foundation for the Evaluation of Women's Labor (KED), 2006).

Özger et al. (2019) observed in a study with Syrian children in a preschool class that Turkish parents' negative attitudes towards Syrians harm the relationship between Turkish children with Syrian children. On the other hand, it was pointed out that the children of Turkish families who have a positive perspective on Syrian children demonstrate the opposite approach. The issue that Syrian children do not know the spoken language, do not follow the rules in the classroom and have cultural differences that affect eating habits brings along conflicts in communication and fights within the classroom after some time.

Ouyang et al. (2021) observed in a study with South Korean children aged 3-5 and their fathers in which children from different races were shown to the South Korean children that the children had positive perceptions on these children from different races, but the perceptions of their fathers were negative. This study is significant in terms of reducing the prejudices of fathers against different races and supporting the positive emotions of children.

The studies also show that the negativities experienced during the immigration process affect the social-emotional development, education, and friendship relations of children (Kolay, 2021; Elvis, 2019; Avara, 2019; Buyurgan & Asal, 2018; Ekinçi, 2008). The fact that they do not know the language of their new country may cause uneasiness, fear, and feeling of exclusion. At the same time, children who share their schools, playgrounds, and countries with refugee children, observing or hearing about the negativities experienced during the immigration process may cause them to have negative attitudes towards refugee children (Avcı, 2020; Kılınç, et al., 2018; Şentürk, et al., 2017; Ergin & Ermağan, 2011).

In the preschool period, children can perceive and interpret judgments and situations differently, and they can express this through metaphors. Kemal (2003) stated that metaphor is a clear expression of how people perceive the world and their thoughts about objects and events. Morgan (1980) states that metaphor reflects the way people understand the world. The literature review shows that there are metaphor studies conducted for understanding the perceptions of children. Kılınç et al. (2018) gathered the metaphors of Turkish and Syrian children on understanding their perspectives on the concept of migration, by using the interview form, through one-on-one interviews with the children in Turkish language. Doğan et al. (2020) obtained the perceptions of children about the concept of game through metaphors. Karademir and Demirel (2020) obtained preschooler children's perceptions of teachers through the metaphors they produced. Yazıcı et al. (2018) attempted to determine the perceptions of children attending preschool education institutions in Turkey, Bulgaria, and Cyprus regarding the concept of school through metaphors. The aim was to embody the abstract perceptions of children through several metaphor articles created with children in the literature (Yıldırım & Şimşek, 2013).

The study is significant in terms of better understanding the impact of the events experienced and encountered by refugee children in the immigration process from both sides and different perspectives and contributing to the integration of children into society by creating classroom-in-school activities, and a positive classroom-school climate. In this direction, the study aims to reveal the perceptions of 5-6-year-old Turkish and Syrian children who share the same classroom environment in a preschool education institution, by use of metaphors.

2. Method

2.1. Research Model

The study was designed in the phenomenology pattern, one of the qualitative research methods. Phenomenology is a design used to reveal individuals' experiences, perceptions, and the meanings they attach thereto regarding a phenomenon (Annells, 2006; Yıldırım & Şimşek, 2016).

In this study, the phenomenology design was used as it allows to explain in-depth the metaphors of Turkish and Syrian immigrant children's perceptions of each other in the same educational environment and the reasons for choosing these metaphors.

2.2 Population and Sampling

The study was carried out in the kindergarten of a primary school selected through impartial assignment among the schools with Syrian children attending preschool education in one of the provinces in Turkey where Syrian immigrants live the most. It was conducted with 34 Turkish and 22 Syrian children in the 5-6 age group receiving education in the same kindergarten. Turkish children are 15 boys and 19 girls and Syrian children are 10 boys and 12 girls, and all children receive preschool education for the first time.

2.3 Data Collection Process

The data were obtained through a semi-structured open-ended form. During the formation of the data collection tool, studies in which metaphors were used to reveal perceptions were examined (Doğan, 2017; Kaya, 2014; Pesen, 2015; Şentürk, et al., 2017). In order to reveal the perceptions of Turkish and Syrian children participating in the study towards each other, Turkish children were asked "Your new friend/friends from Syria resemble/resembles or is/are like... because ..." and their answers were noted and Syrian children were asked "Your friends in your

new class resemble/are like ... because ..." and their answers were noted. The interviews were performed with the children one by one in the natural environment of the classroom and in Turkish. All the Syrian children in the study understood Turkish but some of them had difficulties speaking. In the interviews with these children, support was received from an Arabic-speaking interpreter. During the data collection process, the children did not experience any difficulties in answering the questions asked in concrete terms.

2.4 Research Ethics

At the beginning of the study, necessary permissions were obtained from the institution, the teachers of the classes in which the study was conducted, and the families of the children participating in the study in order for performing the study with the children attending the school. Before the data collection process, families were interviewed one by one and informed in this regard. In the interview to be conducted with the children to be included in the study, both families' opinions about the question to be asked and their consent for allowing the children to participate in the study were obtained. Similarly, interviews were conducted with the teachers and their consent was obtained as well.

In the study, certain measures were taken during the data collection process in order to prevent the attention of children to be drawn to the issue of ethnic or racial compatibility in a negative manner. Following the direction of a few questions about their Turkish friends, Turkish children were asked about their Turkish friends. In the interviews with Syrian children, after asking them a few questions about their Syrian friends, a question was asked about their Turkish friends, and then the interview continued about their Syrian friends. In the interviews performed during this process, in order not to create racial prejudice, Syrian children were referred to as *your new friend/friends from Syria in your class* instead of *Syrian child* and Turkish children were referred to as *your friends in your new class* instead of *Turkish children*.

2.5 Data Analysis

In this study, the content analysis method was used for assessing the obtained data. The main objective of content analysis is to reach concepts and relationships that can clarify the collected data (Yıldırım & Şimşek, 2016). The analysis and interpretation of the metaphors created by the children were carried out in five stages as naming (1), classification (2), category development (3), providing validity and reliability (4), and transferring the data to the computer environment (5) (Çelikten, 2006; Saban, 2009; Taşdemir & Taşdemir, 2011; Yıldırım & Şimşek, 2016). The phase of determining the codes and themes related to metaphors was performed separately by three researchers. During the coding phase of the data, each expression was examined. Afterwards, the coding of the three researchers was reviewed and their compatibility was checked. The similarity rate was used to calculate the reliability of the coding made by the researchers. This similarity, also called internal consistency in the Miles and Huberman (1994) model and conceptualized as the consensus among encoders, was calculated using the formula $Agreement (Agreement + Disagreement) \times 100$. According to Miles and Huberman (1994), a reliability calculation of 70% or more is considered reliable for qualitative research. In this study, the concordance was calculated as .84 and the conclusion was reached that the categories determined according to the researchers' opinions were highly consistent.

3. Findings

In the study aiming to examine the views of preschooler Turkish and Syrian children on their perceptions of each other, the findings obtained from the metaphors created by the children about each other are analyzed and given in subtitles.

3.1. Turkish Preschooler Children's Perceptions of "Syrian Child"

The themes obtained from the metaphors that Turkish preschooler children have created regarding their perceptions of the "Syrian child" are presented in Table 1.

Table 1: The metaphors of Turkish preschooler children regarding their perception of "Syrian child"

Categories	Metaphors	f
School and friends at school	Ritan (4), Ahmet (2), Berat (1), School (1), Boy (1)	9
Animal	Cat (2), Lion (1) Elephant (1), Turtle (1), Dog (1), Rabbit (1)	7
Nature	Sun (2), Tree (1), Sky (1), Water (1)	5
Family	Mother (1), Cousin (1)	2
Game/Toy	Playing (4), Toy (1)	5
Other	Thief (1), Snowman (1), Robot (1), Train (1), Eye (1) Mirror (1), Turk (1), Syria (1)	8
Total		36

The metaphors created by the Turkish children participating in the study about the "Syrian children" were categorized as *school and friends at schools*, *other*, *animal*, *nature*, *game/toy*, and *family*.

Category of School and Friends at School. It is seen that the metaphors of *Ritan* and *Ahmet* are expressed the most under this category, followed by the metaphors of *Berat*, *School*, and *Boy*. Under this category, among the Turkish children, the opinion of C1 was "*Syrian children are like Ritan because Ritan is a Syrian child*", while the opinion of another child, C2, was "*Syrian children are like school because I like my school very much*". C3 expressed his/her opinion on the perception of Syrian children as "*Syrian children resemble Ahmet because he does not speak at all*".

Category of Animal. Cat metaphor was used the most under the category of animal. Cat metaphor is followed by the metaphors of *lion*, *elephant*, *turtle*, *dog*, and *rabbit*. Examples of the thoughts expressed by Turkish children about this metaphor include the opinion of C4 as "*Syrian children look like turtles because the faces of Syrian children are always the same, like turtles*", C5 as "*Syrian children look like cats because their eyes are like the eyes of cats*", C6 as "*Syrian children are like rabbits because they do not speak like us*", and C7 as "*Syrian children are like elephants because elephants are very big and they walk slowly*".

Category of Nature. In this category, the metaphor of *Sun* was used the most. Followed by the metaphors of *tree*, *sky*, and *water*. Examples of the thoughts expressed by Turkish children in the metaphors created in the category of nature include the opinion of the C8 as "*Syrian children are like trees because the leaves of trees are falling, they are like them*", C9 as "*Syrian children are like the sky, they resemble the clouds, there are too many of them*", C10 as "*Syrian children resemble water because the water flows*".

Category of Family. In this category, the metaphors of *mother* and *cousin* were created. Examples of the thoughts expressed by Turkish children in the metaphors created include the opinion of C11 as "*Syrian children are like mothers because mothers gave birth to them*".

Category of Game/Toy. In the category of game/toy, the metaphors of *playing* and *toy* were created. Examples of the thoughts expressed by the children about the metaphors created include the opinion of C12 as "*Syrian children are like toys because they have the same clothes as we have the same toys*", C13 as "*Syrian children are like playing because I get bored while playing*", and C14 as "*Syrian children are like playing because I like playing games*".

Category of Other. The metaphors in the category of other include *thief*, *snowman*, *robot*, *train*, *eye*, *mirror*, *Turk*, and *Syria*. Examples of the thoughts expressed by the children about the metaphors created include the opinion of C15 as "*Syrian children are like snowmen because snowmen are not beautiful, like Syrians*", C16 as "*Syrian children are like Turks because Turks love them very much*", C17 as "*Syrian children are like trains because the train takes them away*", C18 as "*Syrian children are like robots because we cannot understand what they say, like we cannot understand what robots say*".

3.2. Syrian Preschooler Children's Perceptions of "Turkish Child"

The themes obtained from the metaphors that Syrian preschooler children have created regarding their perceptions of the "Turkish child" are presented in Table 2.

Table 2: The metaphors of Syrian preschooler children regarding their perception of "Turkish child"

Categories	Metaphors	f
Fun and Liked Things	Playing (3), Candy (2), Cat (1), Dog (1), Game (1), Toy (1), Painting (1)	10
Home and School	Mother (2), Teacher (1), Home (1), Sibling (1), Mother-father-child (1)	6
Nature	Cloud (1), Tree (1), Sky (1)	3
Other	Mirror (1), Glass (1), Rope (1), Are you okay? (1)	4
	TOTAL	23

The metaphors created by the Syrian preschooler children participating in the research about "Turkish children" were categorized as *Fun and Liked Things*, *Home and School*, *Nature*, and *Other*.

Category of Funny and Liked Things. *Playing* and *Candy* are the most common metaphors created by Syrian children about "Turkish children". Among the metaphors created, there are the metaphors of *cat*, *dog*, *game*, *toy*, and *painting*". Examples of the thoughts expressed by the children about the metaphors created include the opinion of C19 as "Turkish children are like cats because Turkish cats are very beautiful.", C20 as "Turkish children are like games because they too many.", C21 as "Turkish children are like playing because I have fun with them.", and C22 as "Turkish children are like painting because I love them".

Category of Home and School. The most selected of the metaphors created under this category is *mother*, followed by *home*, *teacher*, *sibling*, and *mother-father-child*. Examples of the thoughts expressed by the children about the metaphors created include the opinion of C23-34 as "Turkish children are like mothers because mothers protect", C25 as "Turkish children are like teachers because teachers love", C26 as "Turkish children are like siblings because I have few siblings, they are my siblings", and C27 as "Turkish children are like mother-father-child because they are a family".

Category of Nature. Under the category of nature, the metaphors of *tree*, *cloud*, and *sky* were created. Examples of the thoughts expressed by the children about the metaphors created include the opinion of C28 as "Turkish children are like the sky because they resemble the sky", C29 as "Turkish children resemble clouds, because they are like the sky and I am like Syria", and C30 as "Turkish children are like trees because trees bloom".

Category of Other. Under the category of other, there are metaphors of *mirror*, *glass*, *rope*, *how are you*, and *are you okay*. Examples of the thoughts expressed by the children about the metaphors created include the opinion of as "Turkish children are like a rope because they are very few" and C32 as "Turkish children are like "How are you, are you okay?" because they always ask like that".

3.3. Common Metaphors Used by Turkish and Syrian Preschooler Children

Themes obtained from the common metaphors used by Turkish and Syrian preschooler children are given in Table 3.

Table 3: Common Metaphors Used by Turkish and Syrian Preschooler Children

Metaphor	f
Playing	5
Mother	3
Tree	2
Cat	3

Game	3
Mirror	2
Dog	2
Sky	2
Toy	2
Total	24

Among the metaphors created by Turkish and Syrian children, *tree, mother, mirror, cat, dog, sky, game, toy, and playing* are common metaphors. For example: Regarding the metaphor of *tree*, the opinion of the Turkish child was "*Syrian children are like trees because the leaves of the trees are falling, they are like them*", while the opinion of the Syrian child was "*Turkish children are like trees because the trees bloom*". Regarding the metaphor of *cat*, the opinion of the Turkish child was "*Syrian children are like cats because they hurt cats*" while the opinion of the Syrian child was "*Turkish children are like cats because Turkish cats are very beautiful*". Regarding the metaphor of *game*, the opinion of the Turkish child was "*Syrian children are like games because I like playing games*" while the opinion of the Syrian child was "*Turkish children are like games because I have fun with them*".

4. Discussion

The metaphors obtained as a result of the study provide us with important clues about how Turkish and Syrian children who attend the same preschool education classes perceive each other. 59 metaphors were created from a total of 56 Turkish and Syrian children participating in the study. When metaphors are categorized, the most common categories of metaphors for Turkish children are *school and friends at school, other, animal, nature, game/toy, and family*. During the categorization of the metaphors created by Syrian children, it is observed that *fun and liked things, home and school, other, and nature* were the most selected ones. It has been determined that some metaphors such as *tree, mother, sky, game, toy, playing, cat, mirror, and dog* are expressed jointly by Turkish and Syrian children (Table 3).

The examination of the results show that the metaphors created by Turkish children sometimes contain negativity. Similar results were obtained in the studies conducted on the perceptions of Turkish children towards Syrian children in schools at various educational levels. Seker and Sirkeci (2015) also support this finding of our study. Researchers state that immigrant children have difficulty in making friends at school due to their different lifestyles and limited language skills. However, they stated that Turkish children did not want to accept immigrant children at the beginning, while the immigrant children felt that they were foreigners in the new environment. Şentürk, et al. (2017) reached the conclusion that in the immigration metaphor created by 4th, 5th, 6th, and 7th-grade students, students mostly used negative metaphors and that the negative events in the region led to this. Similar results were obtained in our study. Negative metaphors such as "*Syrian children are like snowmen because snowmen are not beautiful, Syrians are like that*" were created.

In the metaphor analysis study on immigrants, conducted by Alivernini et al. (2019) with 840 eighth grade students attending Italian schools, the conclusion was reached that Italian children created metaphors that expressed negativity, such as something disturbing or annoying about immigrants. At the same time, it was stated that male students had more negative feelings than female students.

Özger et al. (2019) observed in a study with Syrian children in the preschool class that Turkish parents' negative attitudes towards Syrians harm the relationship of Turkish children with Syrian children. On the other hand, it was stated that the children of Turkish families who have a positive perspective on Syrian children demonstrate the opposite approach. The issue that Syrian children do not know the spoken language, do not follow the rules in the classroom, and cultural differences affecting eating habits brings along conflicts in communication and fights within the classroom after a while. Kara et al. (2016) examined students' perceptions of the concept of Syrian refugees in their study with university students. As a result of the study, it was determined that 12.9% of them had a positive perception and 87.1% of them had a negative perception towards Syrian refugees.

Karagözoğlu (2017) conducted a study with secondary school students and 204 students from different secondary schools participated in the refugee metaphor study. The conclusion was reached that the most created metaphors about refugees by the secondary school students participating in the study were *bird* (12.74%) and *coward* (7.35%) with negative content. Brown (2011) examined children's attitudes towards immigrants and immigration in his study with American children aged 5-11 years. As a result of the study, the conclusion was reached that American children have negative attitudes towards immigrants, especially Mexican immigrants. Hartley et al. (2021) stated in their study with children aged 10-12 living in Western Australia that they exhibit prejudiced attitudes towards asylum seekers-refugees and avoid interacting with refugee children. At the same time, it was stated that positivity towards refugees-asylum-seekers increased, and attitudes of prejudice decreased in children in the short and long term, thanks to the intervention program implemented. Brody et al., (2006) conducted a longitudinal study with African and American children and observed an increase in perceived discrimination that resulted in a rise in behavioral problems and depressive behaviors.

Another study with African and American children conducted by Seaton et al. (2009) tested the relationship between children's perceptions of racial discrimination and racial identity. In this study, it was observed that racial discrimination is negatively related to social respect. At the same time, perceived racial discrimination is thought to be related to negative views of society.

Rodriguez (2021) reached the conclusion that immigrants may be exposed to racialization in the interactions of teachers and students in schools, as a result of which youth experiences are negatively affected and they feel worthless. Violante et al. (2020) concluded in a study with American preschoolers that children consider English-speaking individuals who were born and raised in the USA as Americans rather than individuals who immigrated to their country. Becker et al. (2022) concluded in a study with children living in Switzerland and Poland that children demonstrated negative attitudes and behaviours towards immigrants living in their countries and this circumstance did not have any difference from the attitudes of their parents. Demintseva (2020) stated in her study with children in Russia that there are children of different ethnic origins in these schools, where certain schools are perceived as immigrant schools. It has been concluded that children make a distinction between immigrant children and themselves as "us and them".

Another result of this study is the creation of metaphors with more positive meanings such as *mother*, *home*, *game*, and *teacher* by Syrian children. Another study conducted with older age groups shows that similar positive metaphors emerged. Akkaya (2013) revealed the perceptions of Syrian refugees learning Turkish in Turkey about the Turkish language through metaphors. The study showed that Syrian refugees mostly used the metaphors of *mother*, *home*, and *human*. According to this result, it was stated that Syrian refugees have a positive perception of the Turkish language. Following the examination of the metaphors created in the study, it was concluded that the Syrian refugees came to an orderly environment from chaos, and they subconsciously trusted the Turks and Turkey.

Süzen (2020) stated that refugee children from other countries consider Turkey as a hand of compassion, a place of reliance and shelter. Avcı (2020) concluded that Syrian refugee children feel safe in Turkey. Archakis (2016) reached the conclusion that the immigrant students of Albanian origin who immigrated to Greece had positive attitudes and discourses towards Greeks who shared their country and schools with them. From this point of view, we can reach the conclusion that the positive metaphor used by Syrian children in our study may be related to their gratitude and embarrassment towards Turkish children with whom they share their classrooms, toys, and meals. The studies show that negative expressions against immigrants are seen in other countries of the world that accept immigrants as well.

Şengül (2019) shows that children's perspective on the world is affected by the forced migration they have experienced. The fact that children consider Syria and Turkey as equals demonstrates that they are not affected at the same rate as adult immigrants in this process. One of the remarkable results of the study is that Syrian and Turkish children attach different meanings to the same metaphors. For example, regarding the metaphor of the *tree*, the Turkish child expressed his/her as "*Syrian children are like trees because the leaves of the trees are falling, they are like them*", while the Syrian child expressed his/her as "*Turkish children are like trees because trees bloom*".

Kılınç et al. (2018) collected the metaphors they created for understanding the perspectives of Turkish and Syrian children against the concept of migration in Turkish language through one-to-one interviews with children. The results of the study indicate that Turkish children use the metaphor of 'to reach' as to go and Syrian children as to move. A significant result of the study seems to be that Turkish and Syrian children define the concept of migration in different ways, and the negative events they experience have a significant impact on their perspectives on this issue. Another finding is that the negative perceptions of Turkish children may be caused by the attitudes of the adults around them and especially their families. For example, a Turkish child said, "Syrian child is similar to Ritan because Ritan is a Syrian child, I do not play with Syrian children, my mother told me they are not your friends, do not play with them". Another Turkish child said, "Syrian child is like playing with Ritan because Ritan is a Syrian friend of mine", while another Turkish child used the expression "Syrian child is like Ritan because Ritan is my Syrian friend".

We can tell that children are under the influence of their families and close circles in terms of prejudices, as in many other issues. Studies show that preschooler children begin to become aware of racial differences under the influence of the adults around them, and they may create prejudiced attitudes and discriminatory behaviours against different races and individuals through imitation (Beneke & Cheatham, 2019; Jordan & Hernandez-Reif, 2009; Kaufman & Wiese, 2011).

5. Suggestions

1. Based on the results of this research, the following recommendations may be made:
2. Various educational activities can be organized to support Turkish and Syrian children to develop more positive relationships with each other. Educational programs may be developed in this regard.
3. The results may be compared by conducting similar studies in schools where there are fewer Syrian immigrant children.
4. The relationships between these groups may be examined by comparing the perceptions of teachers and families with the perceptions of Syrian immigrants and the perceptions of children.
5. In-service training may be given to teachers on the integration of immigrant children into the classroom and the integration of children sharing the same class.
6. Families and teachers may be trained on respect for differences and multiculturalism.

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8th Graders' Interpretation of Equal Sign in Scratch: Pan Balance Activities

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Abstract

The purpose of this study was to investigate how the 8th graders interpreted the equal sign in the pan balance activities they created on Scratch. Five eighth graders (4 girls and 1 boy) in Turkey participated in this study. Case study was employed as a qualitative research method. Data was gathered through the Scratch files created by the students and the think-aloud protocol interviews with them. The questions used in the activities were prepared in accordance with the test created by Matthews et al. (2012). For data analysis, content and descriptive analysis methods were employed. Findings showed that participants interpreted the operational questions as operational and relational questions as relational through using Scratch. Another significant finding emerged in Scratch activities was the fact that in order for the code block to provide an equation, the pan balance was supposed to balance. Employing Scratch in the class teachings may provide variety in learning environments for teaching of equal sign.

Keywords: Equal Sign, Scratch, Programming, Algebra Teaching

1. Introduction

In every stage of education of algebra and mathematics, the notion of *equation* is treated as a main concept, and the significance of *equal sign* is noted (Alibali et al., 2007). It is especially observed that pupils in early stages are unable to fully comprehend what *equal sign* means, and that they face serious difficulties in interpreting equations (Knuth et al., 2005; Knuth et al., 2006). *Equal sign* can roughly be defined as a symbol that signifies a result or a relation (Öksüz, 2007). In many studies, *equal sign* is handled as a concept which is operational and relational (Alibali et al., 2007; Knuth et al., 2005; Knuth et al., 2006; Stephens et al., 2013). For example, when asked to identify the \square in the equation $8+4=\square+5$, pupils expressed that \square can be defined with number 7 (after adding 8 to 4 as in the left side of the equation, and then extracting 5 from the result) (Yıldız & Atay, 2019). As seen in the example, *operational concept* defines that after the *equal sign* the result or the addition of the two numbers is expected (Alibali et al., 2007; Knuth et al., 2006). Relatively, Stephens et al. (2013) have proven that pupils have solved the equation $57+22=58+21$ by applying *addition* to both sides of the equation.

Relational concept is based on acquiring equivalence on both sides of the equation (Carpenter et al., 2003). Van de Walle et al. (2010) defines *relational concept* as a process that emphasizes numerical relations rather than quantitative calculations of either side of the equation. Studies, on the other hand, indicate that *equal sign* isn't assumed as a symbol that signifies a requirement as to refer to the relations between the figures on both sides of the equation (Behr et al., 1980). Pupils tend to recognize *equal sign* as symbol that signifies result rather than a symbol that reflects relational concept (Kieran, 1981).

In formal education, it is aimed that pupils perceive the *equal sign* as a relational symbol rather than an operational one (Şimşek et al., 2019). It is generally recommended that *equal sign* to be emphasized as a relational symbol that signifies equivalence (Sert Çelik & Masal, 2018). It is important that the teachers describe the *equal sign* as a symbol that signifies the equivalence on both sides of the equation, but not as a symbol that signifies the result of a mathematical operation (Akyüz & Hangül, 2014). Baratta (2011) expressed that the notion of pan balance scale – which signifies the concept of balance – can be used to notify the relational concept of the *equal sign*. Similarly, Akkaya and Durmuş (2006) noted that a pan balance – which is a concrete material – can be employed to show the scale will still balance if same numbers were subtracted from both sides of an equation, and various computer software can also be used to concretize and generalize the subject. In conclusion, for the teaching of *equal sign*, the use of the notion of balance, and concrete materials similar to the pan balance and alike software are frequently mentioned.

Nowadays, various geometry software (i.e., Cabri Geometry, Geometer's Sketchpad, Geogebra, and Cinderella) and algebra software (i.e., Mathematica, Matlab, and Maple) are employed in mathematics education. Also, software regarding programming exists in mathematics education. These include software like Logo, LogoTurk and Scratch that are based on programming. *Logo* -a software used in Computer Assisted Mathematics Education developed by Seymour Papert in Massachusetts Institute of Technology (MIT) Artificial Intelligence Laboratory- is an application that helps students to learn via programming. *Logo* uses basic programming logics and simple graphic commands in order to support analytical and visual thinking (Baki, 2000). Since it is based on constructivism, *Logo* is a very efficient tool at concretization of abstract concepts (Ar, 2012). Another software nowadays used in programming and gamification is *Scratch*. The coding program *Scratch*, is a visual programming environment developed by Lifelong Kindergarten group -a part of MIT Media Lab- designed for the use of individuals aged between 8 and 16 (Scratch, 2017). *Scratch* mainly aims to provide to the newcomers a nice and endearing introduction to the world of programming (Erol, 2015). Besides programming education, gamification can make the teaching of classes such as mathematics, science, foreign language, and social sciences more enjoyable (Çatlak et al., 2015). In this context, the purpose of this study was to investigate the eighth graders' interpretation of the equal sign in pan balance activities they created on Scratch; and the research question was: *How do eighth graders employ equal sign in their pan balance designs using Scratch?*

1.1 Theoretical Context

1.1.1 Equal sign

One of the important symbols in algebra is *equal sign* (Alibali et al., 2007). *Equal sign* is a relational symbol that signifies that both sides of an equation are equivalents and are exchangeable (Kieran, 1981). Many studies put forward that students pupils *equal sign* as an operational symbol not a relational one (Behr et al., 1980; Byrd et al., 2015; Falkner et al., 1999; Kieran, 1981; Knuth et al., 2005; Knuth et al., 2006; Yaman et al., 2003). For example, Kieran (1981) stated that elementary and high school and university students perceived *equal sign* as a symbol that divides the operation and the solution. Baiduri (2015) expressed that undergraduate students perceived *equal sign* not as a relational symbol but as operational. Behr et al. (1980) denoted that even though the ages of pupils' progress, the perception of *equal sign* remained the same. Despite that fact that pupils are expected to comprehend *equal sign* as a relational symbol signifying that expression on both side of an equation are equivalents, they perceive as an operational symbol.

The interpretation of the *equal sign* by pupils has an influence on their comprehension of mathematical equivalence and relation in early algebra education (Byrd et al., 2015). Generally, a mathematical equivalence represented by *equal sign* signifies the principle that both sides of an equation represent equivalent symbols (Rittle-Johnson et al.,

2011). Rittle-Johnson et al. (2011) expressed that the comprehension of a mathematical equivalence requires perceiving that both sides of an equation represent equivalent symbols. Similarly, Knuth et al. (2006) pointed out a meaningful relation regarding pupils' in solving equivalent equations, who perceived *equal sign* as a relational symbol. Baiduri (2015) stated that the number of pupils using *equal sign* in solving equivalent equations was low. It was observed that pupils who perceived *equal sign* as a relational symbol performed better with equivalent equations (Alibali et al., 2007; Knuth et al., 2005). Students, in defining equivalent equations, have not used the conversions that they referred to in solving equations (Steinberg et al., 1991). Temur and Sancak (2012) expressed that in order to encourage students to find out different methods and develop strategies to explore equal sign, asking questions (e.g., why, how, is there an alternative method for the solution, and is an easier method possible?) might support their learning process. To sum up, students who perceive *equal sign* as a relational symbol are observed to better comprehend mathematical equivalence expressions and to be more successful at solving equations that contain equivalent expressions.

Rittle-Johnson et al. (2011) aimed to prepare an assessment that will define systematically changes in the knowledge of equivalence. Mathematical equivalence signifies the principle that both sides of an equation represent equivalent values. They stated that equivalence assessments - in order to meet their individual needs - may help the educators with evaluating and diversifying education. Four different levels were referred to for the coding of the test. These levels have been also referred to in determining the students to take part in this study. Similarly, Matthews et al. (2012) conducted a study to define how much the perception of *equal sign* by children contributes to algebraic thinking. During the research, to assess the knowledge of equal sign, evaluation scales (Rittle-Johnson et al., 2011) -examined and rearranged by four different mathematic educators experienced in researching the algebraic thinking in children- was used. Evaluation clauses were mostly based upon previously published studies or queries included in previously published studies. Queries were handled in three different categories: (Equation-solving items), deciding if it right or wrong (Equation-structure items), and definition of *equal sign* (Equal-sign items). Study included advanced reasoning items such as conversions regarding the preservation of equivalence ($76 + 45 = 121$, $76 + 45 - 9 = 121 - 9$) and equation items that embodied variable letter ($n+n+n+2=17$). It is stated that students with advanced knowledge of *equal sign* were more likely to solve the algebraic items included in the test. This study was conducted with participant who had no former experience with variables or letters in equations. It was observed that participants faced more difficulties in solving equations that included variables (letters) than maintenance of equivalence that included only numeric. It was also concluded that the use of pen and paper test technique for this study has been a restricting factor and that students had abilities and knowledge that they were unable to put forward due to use of pen and paper test technique. It was also noted that the unification of interviews with the participants and the written evaluations would help build a better understanding of the performance of the participants.

Studies regarding *equal sign* are usually conducted with the participation of students from different classes (i.e., Knuth et al., 2005; Stephens et al., 2013; Yaman et al., 2003). Studies conducted with the participation of single class students also exist (Falkner et al., 1999; Yıldız & Atay, 2019). In addition, during the data collection stage of these studies, participants were given questions on paper (i.e., Alibali et al., 2007; Knuth et al., 2006; Matthews et al., 2012) and they were also interviewed (i.e., Yaman et al., 2003; Yıldız & Atay, 2019). Stephens et al. (2013) recorded that it is possible to collect data via individual interviews with the participants. Furthermore, the age 13 has been noted as critical for the relational comprehension of *equal sign* (Yaman et al., 2003). Therefore, it is considered to be fair to conclude if and when a research about *equal sign* will be conducted, the participants of the study may be of a single grade, and the ages of participants must be 7th grade minimum. Various studies have concluded the fact that pupils perceive *equal sign* as a figure that signifies result rather than, in fact, a figure that signifies equivalence, and that they face difficulties in comprehending the use of *variables* (Akkaya & Durmuş, 2006; Knuth et al., 2005). Providing a relational perception of equal sign helps pupils to be more successful in solving equivalent equations (Knuth et al., 2005). Studies have shown that even though *equal sign* is presented as a symbol that signifies a relational concept, it is perceived by the pupils as an operational symbol.

1.1.2 Scratch

Scratch is a simple programming software that enables users to code by using code blocks. It is a free programming language with which it is possible to create interactive stories, games, and animations (Saez-Lopez et al., 2016).

Scratch programming language offers programming blocks grouped in eight different categories: motion, looks, sound, events, control, sensing, operators, and variables. Pupils can freely choose code blocks required to make real life objects move like they would in the real world (Kakavas & Zacharos, 2019). It is possible to use Scratch software in teaching of many classes since, with the help of diverse multimedia items, it enables putting forward various projects (Çatlak et al., 2015).

Saez-Lopez et al. (2016) recorded that it is possible to make use of visual programming language software in order to understand logic, mathematics and content creation items. Scratch helps students develop and utilize their mathematical thinking abilities (Taylor et al., 2010). Calder (2010) noted that Scratch functions as an incentive for the students' learning mathematical concepts, and that it could be used during the problem solving process and developing mathematical thinking. Gökdağ et al. (2022) emphasized students developed aesthetic experiences through exploring tessellations with Scratch. Kilhamn and Brating (2019) stated that during the programming educations given at schools, students will encounter algebraic variables, structures, and patterns. Calao et al. (2015) emphasized that the use of Scratch in Mathematic classes creates a motivational teaching environment where students develop their problem solving, reasoning, and mathematical exercise performances. Lai and Yang (2011), after interviews with the students, reflected that they with low academic achievement are less interested in classes, and that employment of Scratch in lessons may provide an individual learning opportunity. Lewis and Shah (2012) expressed that Scratch supports the mathematical understanding, and that is especially efficient in comprehension of geometrical relations, and that the teaching of programming curriculum is highly dependent on knowledge of mathematical content. Programming applications provide the students the opportunity to consolidate and enrich mathematical content. To sum up, it is observed that middle school students enjoy coding activities using Scratch and they find the application to be easy to use and entertaining. It is also observed that the use of Scratch in Mathematics classes helped students to motivate to the lessons better. While programming with Scratch, students were observed to be efficient in presenting and utilizing their mathematical skills. Students with low mathematical skills were observed to get bored when using Scratch, and they mostly tend to dislike the application.

2. Method

Single case-holistic design -one of the qualitative research designs- was employed in this study to understand the question *why* to perform an in-depth examination of event that the researcher cannot control (Yıldırım & Şimşek, 2013). In this context, the process of 8th graders' creating pan balance activities using Scratch were thoroughly examined by researchers asking *why questions* to the participants.

Five 8th graders (4 girls and 1 boy) in Konya participated in this study. Participants were selected according to criterion sampling. The *criterion* was the participant to be familiar with Scratch and to score Level 4 in the test developed by Matthews et al. (2012). Participants, who scored Level 4 in the test, successfully solved and evaluated the equation by comparing the expressions on both sides of the equation through various strategies. While participants were creating pan balance activities on Scratch, they were asked to evaluate equations. Real names of the participants were kept hidden; instead, they were referred to with pseudonyms: Sude, Furkan, Rümeyza, Helin and Ayşe.

2.1 Data Collection

The data source of this study consisted of think-aloud protocol interviews with students and Scratch files created by the participants. The activities of participants using Scratch were screen recorded; and these code blocks and outputs were examined thoroughly.

2.1.1 Think-Aloud Protocol Interviews

Patton (2018) defines the strategy of *think-aloud protocol interviews* as participants expressing their emotions and thoughts into words while they are engaged in an activity. Participants were asked *why questions* to reveal their thoughts while they were working on activity worksheets. Questions included in the activity worksheets were

prepared by the researchers and an expert with a PhD in mathematics education. Among 31 questions prepared by Matthews et al. (2012) four questions were selected and revised to be used in Scratch. The questions are as follows:

Question (Q1) of the first activity: Do you think the expression $7=3+4$ is right or wrong? Open the 3rd file in Scratch and design your activity.

Question (Q2) of the second activity: Do you think the expression $31+16=16+31$ is right or wrong? Open the 5th file in Scratch and design your activity.

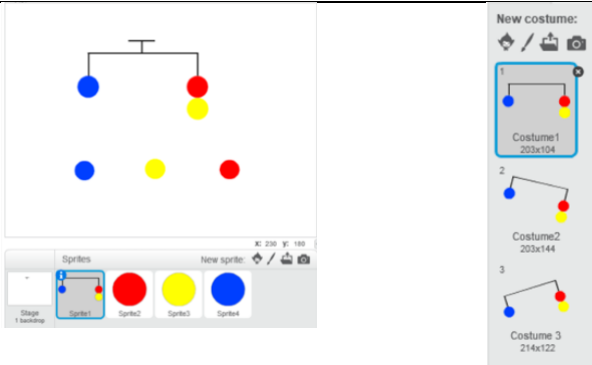
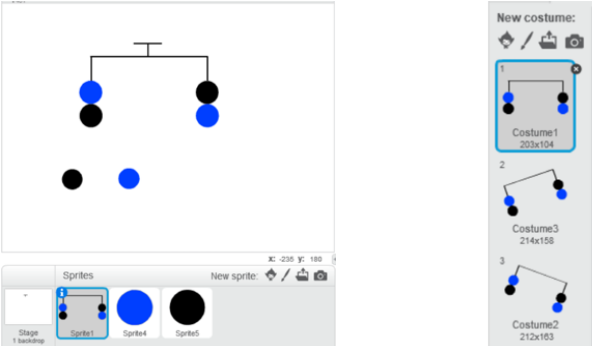
Question (Q3) of the third activity: Do you think the expression $56+85=141$ is right or wrong? Can you tell if the expression $56+85-7=141-7$ is right or wrong without extracting 7 from either side of the expression? Open the 8th file in Scratch and design your activity.

Question (Q4) of the fourth activity: Can you tell if the expression $67 + 86 = 68 + 85$ is right or wrong without performing the addition $67+86$. Open the 9th file in Scratch and design your activity.

These questions contained the different levels of mathematical equivalence knowledge developed by Rittle-Johnson et al. (2011). Q1 was aimed to assess the students' solving, evaluating, and encoding atypical equation structures coherent with the operational aspect of equal sign (Level 2), whereas Q2 tested their solving, evaluating, and encoding the equivalence structures on both sides of the equation (Level 3) by using Scratch. Q3 and Q4 assessed the students' knowledge of solving and evaluating the equations by comparing the expressions on both sides of the equation including the employment of compensatory strategies and conversions providing the equivalence (Level 4) by using Scratch.

2.1.2 Student Scratch Files

Files and outputs that include Scratch code blocks used in the activities created by the students were used in the data analysis. Since the students were expected to create pan balance activities, they were given the scene and characters that they could use with Scratch. They were expected to write codes for these characters. Code blocks were analysed to determine what kind of strategies the students referred to while creating the activities. Scratch files given to the students are as in Figure 1.

Question #	Code Blocks
1.	
2.	

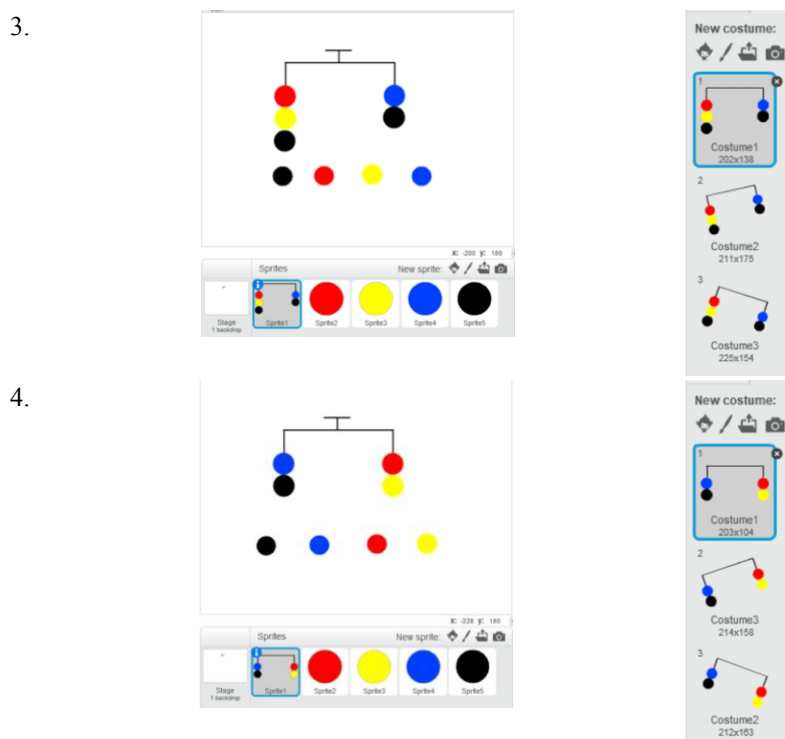


Figure 1: Scratch files given to students

Images seen in Figure 1 were given to participants were instructed to create the required activities. For each activity, students were given *costumes* that provided the shapes to exhibit different movements. A *Costume* was the various animations of the characters included in the Scratch files. Costumes were created because in the Scratch file only Character-1 represented the movement of the scale. These costumes provided the shape to be able to lean to left and right. The images administered to the students were selected to be similar to those included in the activity worksheets. Students were instructed to create the activities making use of the images and the code blocks. Coloured characters represented the variables.

2.2 Data Collection

Individual interviews with the students were performed. It was observed that students spent the most time in their first activity, and that they spent less and less time as the students performed more activities. The reason why the students spent the most time for the first activity was considered to be the fact that it was not very easy for the students to develop strategies for a pan balance activity using Scratch.

The students were asked to read the questions on the activity papers, and their answers were recorded. Then, they opened the Scratch files given to them. While they were in the process of creating the activities on Scratch, they were asked questions aiming to explore the reasons why they created their activities the way they did. Participants were allowed to have breaks between the activities.

2.3 Data Analysis

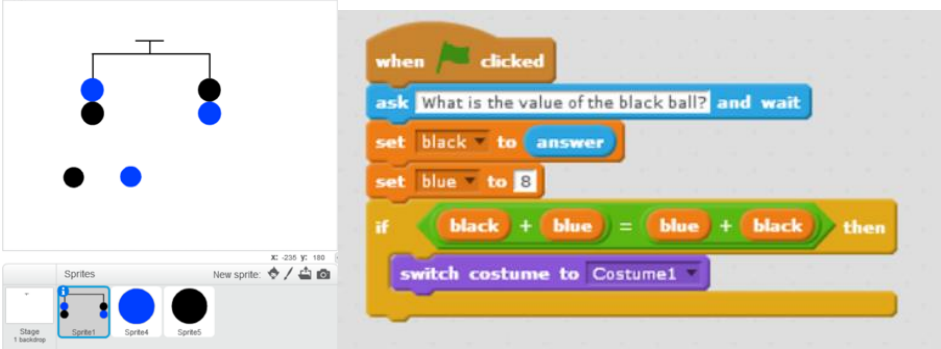
The data consisted of the recordings of think-aloud protocol interviews and the Scratch code blocks created by the participants for the four different activities. *Content analysis* and *descriptive analysis* methods were employed. Firstly, the recordings of think-aloud protocol interviews were transcribed to Microsoft Word files for each student. The transcripts were analysed based on the interpretation of equal sign as *operational* and *relational* (Knuth et al., 2005). The way how the participants interpreted the equal sign was examined. For instance, we interpreted the equal sign as *operational* when the participants checked if expressions on both sides were equal or not by making addition; and as *relational* when they performed comparisons of the expressions on both sides of the equation. Examples of the participants' interpretations were given in Table 1.

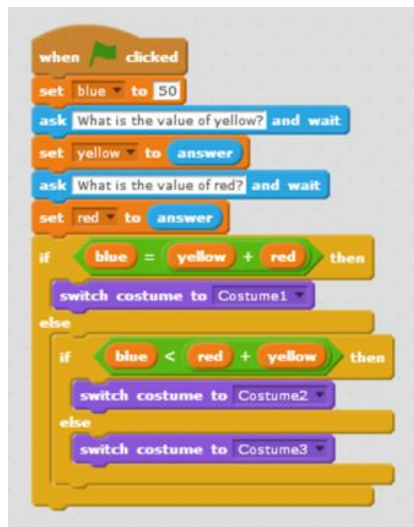
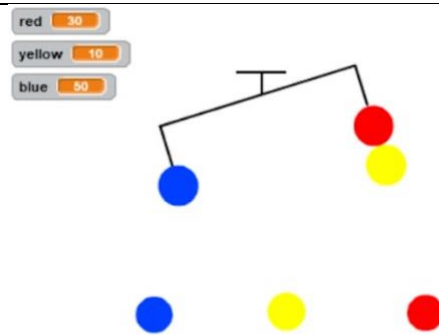
Table 1: Samples of participants' interpretations of equal sign

	Relational	Operational
1. Activity	We can express with different numbers. That is, instead of $7=3+4$, here we can write $7=1+6$. (Helin)	Yes. $7=3+4$. When add 3 and 4, we get 7 that is 7 equals to 7. (Sude)
2. Activity	Replacing the numbers with each other doesn't change the sum. (Rümeysa)	
3. Activity	Figures on both sides of the equation were already equal to each other. When the same number is subtracted from both sides, the result will equal to each other on both sides. (Sude)	
4. Activity	Added 1 to one side and got 68, subtracted 1 and got 85. It is the same on both sides (Sude)	

Scratch code blocks were used to provide information about how the participants created code blocks providing balance or imbalance for the scale. Table 2 shows how they used the code blocks in their activities.

Table 2: Samples of participants' code blocks

Scratch code blocks	
---------------------	-------------------------------------------------------------------------------------



Student's
interpretation
(Balance)

Both sides of the equation contain the same things. This time we do not have three options. Because, no matter what numbers are appointed, the sum of blue and black will always be equal to each other. Numbers appointed to blue and black can be changed, but it will not affect the equation (Rümeysa)

Student's
interpretation
(Imbalance)

If blue equals to red plus yellow, switch to Costume 1. If not, a different costume is needed. Red + yellow can be greater or smaller than blue. Therefore, I added two more costumes. If blue is smaller than red + yellow, switch to Costume 2; if greater switch to Costume 3. (Helin)

The first author carefully followed the activities during data collection, and aimed to obtain in depth knowledge by asking the students *why* and *how* questions. Activity worksheets and Scratch files administered to the participants were analysed by the second author, who had PhD degree in mathematics education and by the third author, who had PhD degree in computer and education technology. Moreover, all transcripts and code blocks were independently coded by three researchers. All disagreements were resolved through discussion. Coding continued until the researchers came to an agreement.

3. Results

Findings were analysed as *relational* and *operational* strategies used in the interpretation of equal sign. Findings were evaluated according the activities they were instructed to create. Table 3 contains the interpretations of the participants classified as relational and operational.

Table 3: The interpretations of the participants classified as relational and operational

1 st Activity		2 nd Activity		3 rd Activity		4 th Activity	
R	O	R	O	R	O	R	O

Sude	X	X	X	X
Furkan	X	X	X	X
Rümeysa	X	X	X	X
Helin	X	X	X	X
Ayşe	X	X	X	X

*Note: R: Relational, O: Operational

While the first activity contained an operational question, the other three activities consisted of relational questions. As seen in Table 3, all students perceived the second, third and fourth activities as relational. It is also noted that Helin also interpreted the first activity as relational.

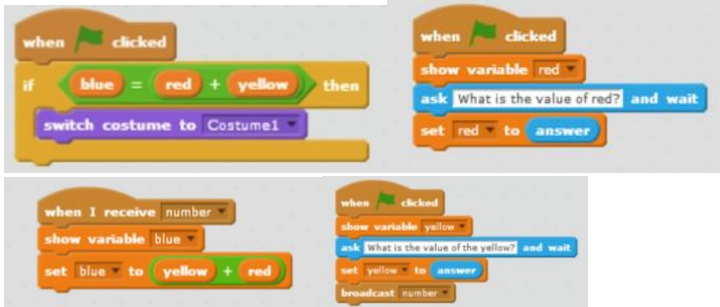
3.1 First Activity

In the first activity students were asked “Do you think the expression $7=3+4$ is correct or not?” and were instructed to open the first file on Scratch and create the activity. All students have replied as *correct*. Table 4 contains the answers of the students.

Table 4: Students’ interpretations of equation

Student	Statements
Sude	Yes, $7=3+4$. When you add 3 to 4 you get 7, that is 7 is equal to 7.
Furkan	Seven is equal to three plus four. When we add three to four, we get seven. This proves that seven is equal to seven.
Rümeysa	When I add three to four, I get seven. That is, they are equals.
Helin	We can increase the expressions. That is, instead of $7=3+4$, we can also write $7=1+6$
Ayşe	Let’s assume that you have four pencils. Someone comes and gives you three more pencils. Now, you can count and see you have seven pencils. Let’s also assume another person who also has seven pencils. You ask him/her “is the number of pencils you and I have equal to each other?” Upon counting the pencils both you and the other person you get the number seven, so yes, equal.

Only Helin interpreted the equation as relational by comparing the figures without making an addition. The rest of the participants (Sude, Furkan, Rümeysa, and Ayşe) interpreted the equation as operational, by making addition. Figure 2 contains the code blocks created by the students.

Student	Code blocks
Sude	

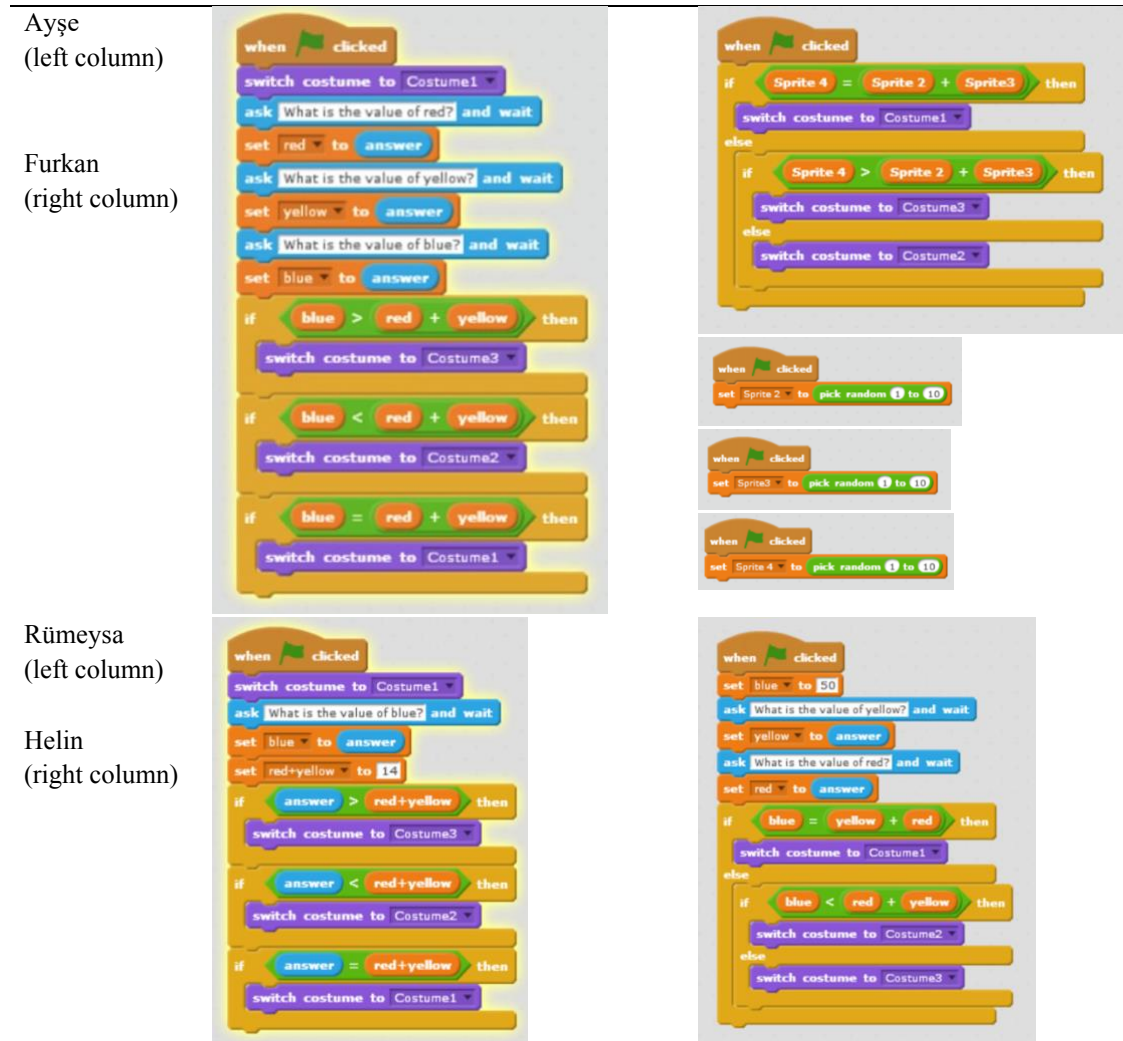


Figure 2: Code block samples created by the students in the first activity

Sude created an activity signifying the shape will never change. All other four students (Furkan, Rûmeysa, Helin, and Ayşe) created additional activities where the shape unbalances and leans to right or left despite defining the equation as *correct*. Students, by assigning numbers to the round shaped sprites, made the shapes move. They thought the shape must unbalance and lean right or left when the numbers assigned to sprites were changed. Conversation with Sude: (P is Participant, R is Researcher)

P: I will see if the equation is correct or not by creating the codes

R: hmmm

P: I will check this

R: Let's think

P: Now blue = yellow + red

P: Then, it should also be replaced here

R: Ok. Does it always shift?

P: But, there is an equation here. No, it doesn't shift.

P: When we add yellow, yellow and red....

R: Yes?

P: We should show they equal to blue

P: If they are equal, the scale must balance.

R: Right. Why did you place the sum to the right instead of left?

P: It matters not. I can place the sum on the left as well.

R: Why did you prefer to place the 3+4 to the right instead of left?

P: Well, because $7=3+4$, that is red + yellow, on the right side

R: Which side?

P: Right side
 R: So that's why you placed red + yellow on the right.
 P: Yes. If it is equal, it is ok.
 R: How will the scale behave if it is equal?
 P: What does it add to? Which costume is this? It must be equal, ok, costume 1 it is. Is it always equal? Switch to costume 1 constantly.
 R: Ok. It will remain in costume 1 constantly. How should the scale behave if yellow plus red is greater than blue? But, when I assign random numbers, I now notice that blue has a smaller number. How should the scale act in this case?
 P: It should switch to another costume.
 R: Switch? How?
 P: If blue is smaller?
 R: Yes.
 P: Then the right side will be greater
 R: What happens when the right side is greater? Does the scale lean towards right?
 P: Yes.
 R: What are you expected to provide?
 P: Equality
 P: That is blue = red + yellow

While designing the activity, the student codes as instructed blue = red + yellow; however, she referred the expression as $3+4=7$ when defining it as *correct*. The same pattern was observed in other participants (i.e. Rümeyisa, Ayşe, and Furkan) as well. Additionally, the students recorded that blue could be either greater or smaller than the sum of red and yellow, but since she was instructed to provide an equation, she coded accordingly. Similarly, Helin noted *Yellow plus red must be equal to blue*, but the rest of the participants (i.e. Rümeyisa, Ayşe, and Furkan) expressed that there could occur three different results. There were some statements of students in the following.

If blue equals to red plus yellow, switch to Costume 1. If not, a different costume is needed. Red + yellow can be greater or smaller than blue. Therefore, I added two more costumes. If blue is smaller than red + yellow, switch to Costume 2; if greater switch to Costume 3. (Helin)

Well, let's see. If both sides are equal, the scale will balance. Red plus yellow equals to fourteen, then if blue is greater or red plus yellow is greater, the scale will lean towards the greater side. (Rümeyisa)

If blue is greater (than red + yellow), the scale should lean this way, which is Costume 3. If red plus yellow is greater (than blue), switch to Costume 2. I need one more costume for balance. There are only 3 possible results. Either left side of the equation is greater, or the right side, or both sides are equal to each other. (Ayşe)

What happens if Sprite 2 plus Sprite 3 is greater? The scale should lean towards right, so switch to Costume 2. If Sprite 4 is greater, switch to Costume 3, if not to Costume 2. What happens if I use *if not*? Let me try. It didn't switch to Costume 1. (Furkan)

Participants coded the double pan scale to act according to the figures appointed to each colour. They ignored the fact that they were expected to pay attention to the point that blue must equal to the sum of red and yellow as instructed in the question.

3.2 Second Activity

In the second activity, the students were asked to identify the expression $31+16=16+31$ as correct or wrong, and create an activity on Scratch using the second file. All participants identified the expression as *correct*. Sude claimed about her solution: "When making an addition, placement of the addends doesn't affect the sum. In other words, when making an addition, we can replace the addends with each other and still get the same sum". Furkan interpreted the equal sign in the same way: "This signifies to the fact that when making an addition, the placement of the addends does not affect the result. When making an addition, if we replace the addends with each other and the sum is equal to each other, it means that the expression is correct." Ayşe' explanation was also similar: "Both sides of the equation are the same. The left side is $31+16$, and the right side is $16+31$. Both sides consist of same

addends and placement of the figures does not affect the sum when making an addition.” All students signified the aspect that even when addends are replaced with each other, both sides of the equation will remain equal to each other. It could be stated that they interpreted the question as *relational*. Figure 3 contains the activities created by the students.






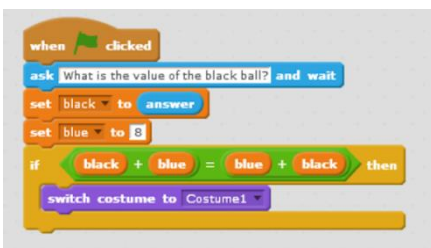
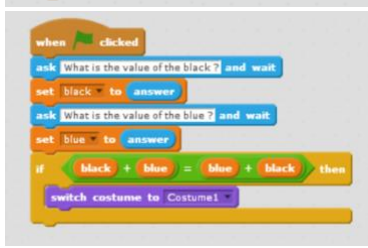
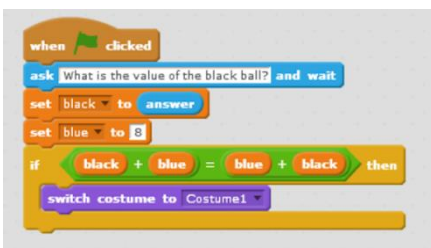
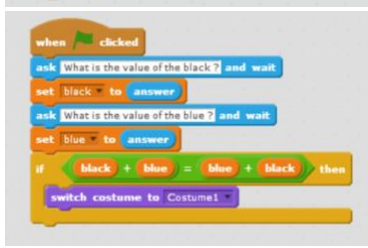

Student	Code Blocks	
Sude (left column)		
Furkan (right column)	 	
Rümeysa (left column)		
Helin (right column)		
Ayşe		

Figure 3: Code block samples created by the students

Sude, Helin, and Rümeysa used only *equal* costume, Furkan provided two additional costumes where the scale will lean to right or left, and Ayşe used an explanatory code block. They created codes that only will provide balance for the scale. Two additional costumes provided by Furkan would not function. Even though all students pointed to the aspect that the placement of addends did not affect the sum, only Sude, Rümeysa, and Helin referred this feature in their codes. Interview with Ayşe:

P: How can I conclude that blue plus black will be equal to black plus blue? Well, if it is equal, will switch to Costume 1 which is balance. Eight and one. The scale will go off balance.

R: If eight and one are appointed, will it go off balance?

P: Yes.

R: Let's try. What number did we appoint to black?

P: Wait a second. It will not go off balance.

R: Why not?

P: Because they are the same. Even though they placed differently, both addends contain the same numbers.

R: So?

P: So, if I appoint 1 for blue, and eight for black, both sides of the equation will sum to 9, and will not go off balance.

R: Why did you switch to *if* from *if not*?

P: There is no *if not*. The sum will always be the same. Because both sides of the equation consist of only blue and black. The places of blue and black are different, but the sum will always be equal to each other.

Ayşe, at first, mistook that the scale would balance only if blue was equal to black; then realized that even if she appoints different numbers to the colours both sides would remain equal to each other. Rûmeysa similarly recorded:

Both sides of the equation contain the same things. This time we do not have three options. Because, no matter what numbers are appointed, the sum of blue and black will always be equal to each other. Numbers appointed to blue and black can be changed, but it will not affect the equation” She also stated the reason for using *if* as *if not* command is not applicable.

Rûmeysa, Helin, and Sude all used a single *if*. Furkan explained why he used two intertwined *if not* codes:

How should it function if equal? It should switch to Costume 1. If not equal, we will need another button. I will code if Sprite 4 plus Sprite 5 is greater than Sprite 5 plus Sprite 4. What will happen if Sprite 4 plus Sprite 5 is greater than Sprite 5 plus Sprite 4? Since the sum is greater, left pan will go down and right pan will go up, which is Costume 2.

He also noted “I need to provide sprite 4 plus Sprite 5 equals to Sprite 5 plus Sprite 4.” and provided the equation by the numbers he appointed to the sprites. During this activity, participants realized that when both sides of the equation contain same addends, the scale must balance. Accordingly, students created code blocks that will provide balance for the scale. Especially, Sude, Helin, and Rûmeysa have shown in their codes that the placement of addends will not change the sum.

3.3 Third Activity



In this activity, participants were asked if the expression $56+85=141$ is correct or not, and if they could tell if the expression $56+85-7=141-7$ is correct or not without making a subtraction; then they were instructed to create code blocks Scratch using the third file. All students identified the expressions as *correct*. There were some examples of students’ statements regarding their equal sign strategies:

It is correct. 56 plus 85 sums to 141. Both sides were already equal to each other before adding minus 7 to both sides. Subtracting same number from both sides will not affect the equation. The result will remain equal to each other. (Sude)

Correct. Erm, without making a subtraction. Well, subtracting seven from both sides does not affect the equation. Because we are doing the same operation on both sides, subtracting seven. Let’s assume that we added seven to both sides, this wouldn’t affect the equation either. Both sides would remain equal to each other. (Rûmeysa)

Yes, correct. There already is an equation. This means the scale will balance. If we put 5 kg apples to both pans, the scale will not go off balance. Because we added equal amounts to both sides. Same applies to the equation. Adding to or subtracting from the same numbers will not affect the equation, the result on both sides will remain equal to each other. Since the sum of $56+85$ was already equal to 141, adding or subtracting any number will not affect the equation. The result will remain equal, and the scale will remain balanced. (Helin)

All participants pointed to the fact that subtracting same number from both sides would not affect the equation and that the scale would remain balanced. Figure 4 contains the activities created by the students.

Student	Code blocks
Sude (left column)	
Furkan (right column)	

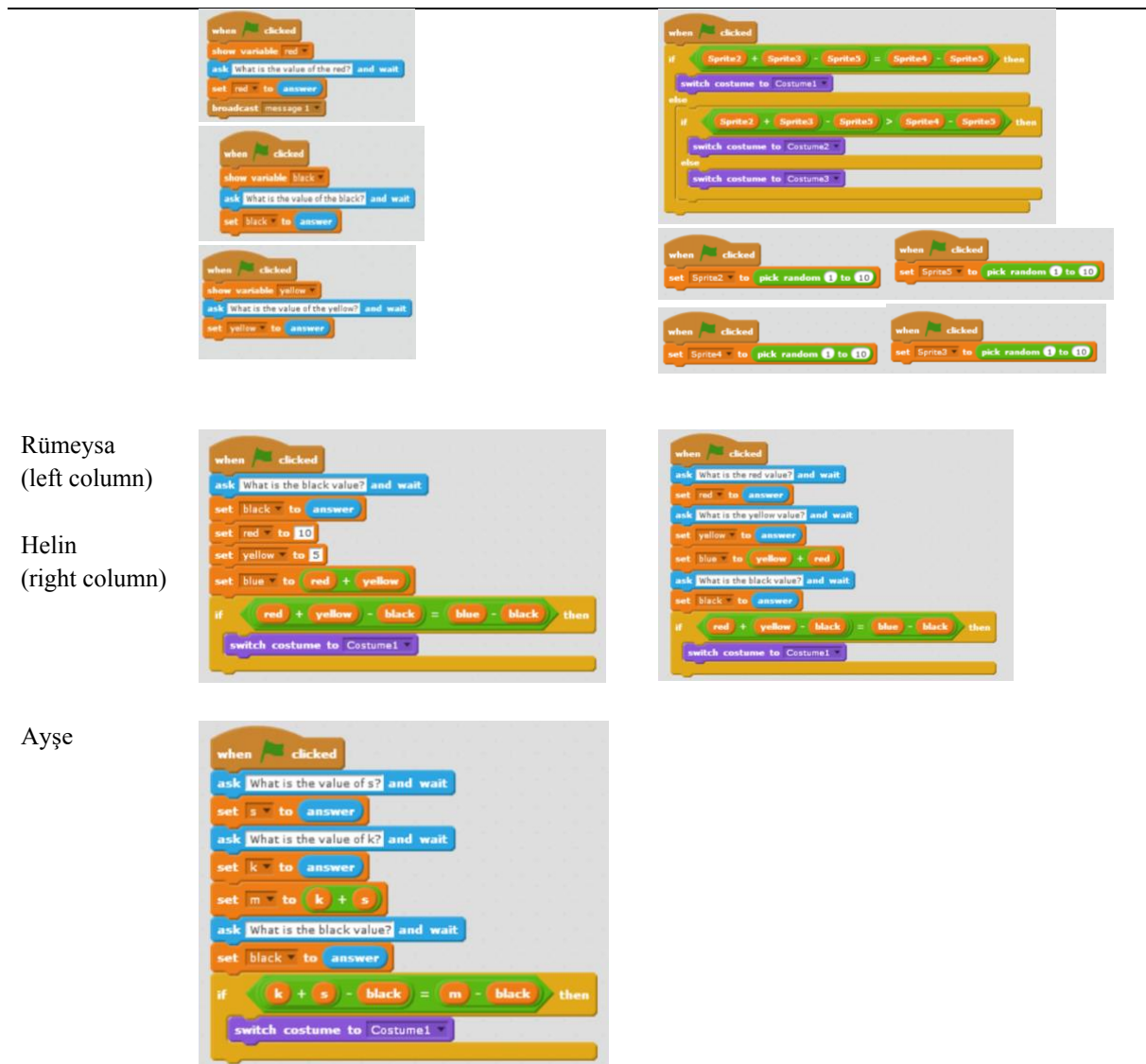


Figure 4: Code block samples created by the students

All students except Furkan used a single *if* in their activities. While Sude, Rumeysa, Helin, and Ayşe created activities signifying the balance, the code created by Furkan included options that signified imbalance. Even though Furkan noted:

If we subtract the same number from both sides of an equation, the result would remain equal after the subtraction. The scale would remain balanced. In order for the scale to remain balanced, the result on both sides of the equation must remain equal. In order for the scale to balance, we need to subtract same number from both sides.

He could not provide this in his code block he created for Sprite 1. Code blocks he created for Sprite 2, Sprite 3, Sprite 4, and Sprite 5 all result in imbalance; because all codes include random numbers, resulting in scale leaning right or left. Rumeysa stated that

If equal it is balanced, if smaller leans to right, if greater leans to left. Let's appoint a number to blue. One second, if blue is red plus yellow, it is not possible to appoint a number to blue. Let me appoint red and yellow. Black will be appointed. Where is blue? Hold on. Blue doesn't exist. Well, blue will be calculated automatically. So, it (blue) cannot be smaller or greater.

Rumeysa at first considered she needed to create code blocks for imbalance, but upon realizing that the sprite (blue) is equal to the sum of two sprites (red and yellow), she created a code that result in balance only. Similarly, Sude said that "We need to provide that blue equals to yellow plus red. The sum of red and yellow equals to blue, and we subtract black from both sides, so both sides remain equal." Helin also stated that "We need to show yellow

plus red equals to blue. So, in this equation, we need to show that the result will remain equal if we subtracted or added the same number to both sides". Ayşe claimed that

Blue equals to the sum of red and yellow. What need to do is to show that both sides are equal, and subtract the same number from both sides. That's why it will switch to costume1 (balance) when the same number (black) is subtracted from both sides in the *if* block.


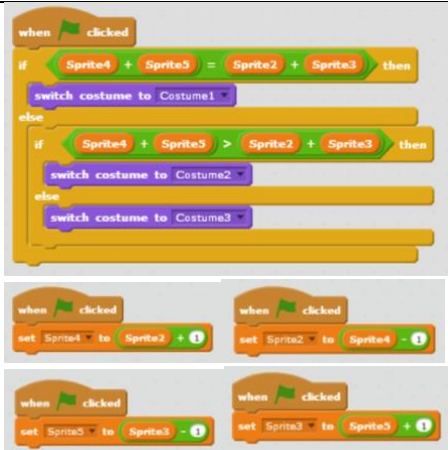

All students, except Furkan, created activities that signified balance.

3.4 Fourth Activity

In the fourth activity, the students were asked to identify the expression $67 + 86 = 68 + 85$ as correct or wrong without performing the addition $67+86$; and create an activity on Scratch using the fourth file. All participants identified the expression as *correct*. For instance, Sude stated that "Correct. Because, plus one is added resulting 68, and minus one subtracted resulting 85. So minus one and plus one equals to zero, and equation remains the same." Furkan explained it by exemplifying the sprites:

I will have two sprites, and by performing addition with these sprites..... Actually, I need four sprites. By performing addition of the first two sprites..... If the sum of first two sprites is equal to the sum of other two sprites, the scale will balance; if the sums are not equal the scale may lean to right or left. $67 + 86 = 68 + 85$, first cluster includes 67, and the second cluster 68, so second cluster is plus one. Also, first cluster contains 86, and the second 85, so the second cluster is minus one. Now it is always balanced. Where did I go wrong? Sprite2 (67) is one less than (68)... and (86) is one greater than (85); this will provide balance. (Furkan)

All students interpreted the equations as relational. They realized that one addend is added and the other is subtracted. Figure 5 contains the activities created by the students.

Student	Code Blocks
Sude (left column)	
Furkan (right column)	
	

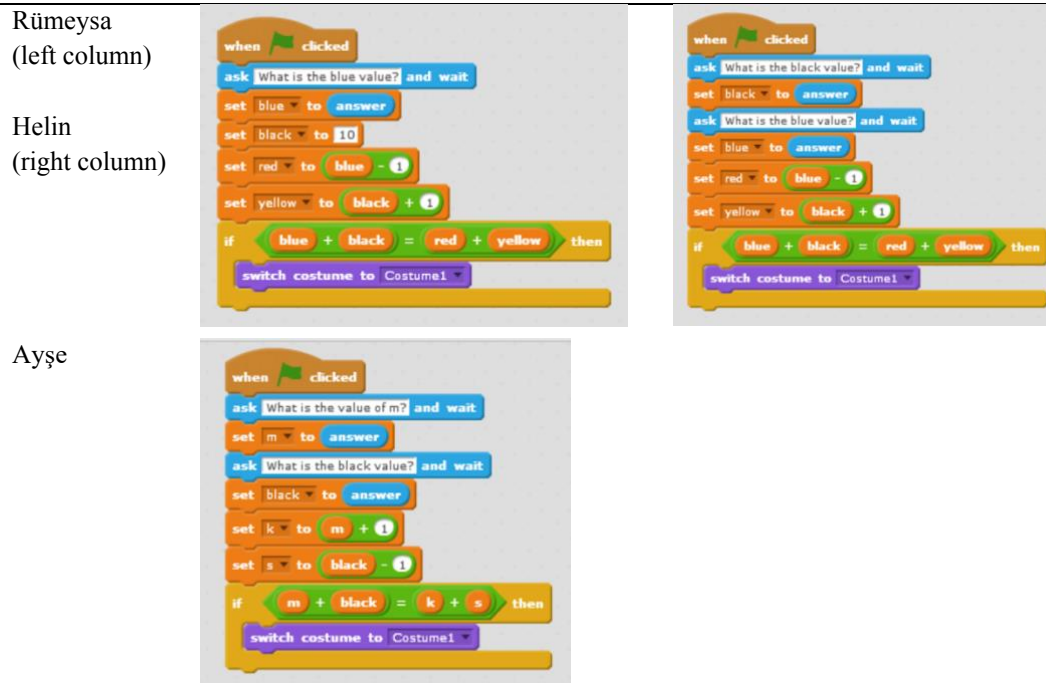


Figure 5: Code Block Samples

All students employed a single *if*, except Furkan. While all four students created activities signifying balance, Furkan created an activity signifying imbalance. Furkan simply managed to provide balance, by appointing numbers to the variables in his code block. All students identified the question as correct, and reflected this on their activities. Furkan explained how they managed the balance: “The scale will balance only if the sum of Sprite 2 and Sprite 3 is equal to the sum of Sprite 4. If not the scale may lean towards right or left”. Furkan created code blocks accordingly. However, he was able to provide balance by appointing certain numbers to Sprite 2, Sprite 2, Sprite 4 and Sprite 5. He stated “Where did I go wrong? Sprite 2 (67) is one less than (68)... and (86) is one greater than (85); this will provide balance. Similarly, Helin signified the balance in this way:

The scale will balance. If I appoint 67 for blue, and 86 for black, erm, and then I suppose red should be 67 plus one that is 68, and yellow should be 86 minus one that is 85. There are three costumes, but it will always switch to Costume 1. Because, both sides will always be equal to each other.

Rümeysa also said that “Black plus one equals to yellow. Blue minus one equals to red. Red and yellow will be appointed automatically. That is, the scale will always balance, which means Costume 1”. It could be argued that while the students were designing the activities, they paid attention to the balance of the scales. For this purpose, that they wrote code blocks that would keep the scales in Costume 1 constantly. When the students wrote the code blocks in which the scales lean towards right or left, they kept the scales in balance with the code blocks they wrote to the variables they created.

4. Discussion

Of the four questions administered to participants, Q1 is operational and Q2, Q3, and Q4 are relational. In Q1, participants were asked ‘Do you think the expression $7=3+4$ is correct or wrong?’ and almost all students made the statement ‘three plus four equals to seven’. Behr et al. (1980) noted that when the left side of an equation consists of a single figure, students tend to rearrange the equation by replacing the figures on the right with the one on the left. Similarly, all participants were observed to replace the figure on the left with the figures on the right. Despite verbally describing the equation as ‘three plus four equals to seven’ ($3+4=7$), when coding the students were observed to refer to the equation in its original state ($7=3+4$). Helin, who provided a relational response, recorded ‘We can increase the expressions. That is, instead of $7=3+4$, we can also write $7=1+6$ ’. Despite stating that both sides of the equation are equal to each other, only Sude was observed to take this fact into account in her Scratch coding. Sude was observed to employ a single *if* in her coding, aiming for the scale to balance.

The second question administered to students was ‘Do you think the expression $31+16=16+31$ is correct or wrong?’ which is a relational question. All students pointed to the fact that when performing an addition if the addends were replaced with each other, the sum would remain the same. The fact that all students interpreted this question as relational coheres with the findings of Behr et al. (1980). In a research conducted by Behr et al. (1980) with participants aged six and seven, it was recorded that the participants were unable to interpret the equation $3+2=2+3$, that both sides of the equation are equal to each other. It was also noted that in an operation that contains two different figures and addition, the participants stated that there should be a result. The inspection of the Scratch code blocks shows that while four of the participants created code blocks that provide balance, Furkan additionally employed greater than and less than symbols. Furkan managed to provide balance, by appointing numbers to the variables in his code block.

The third question administered to students was ‘Do you think the expression $56+85=141$ is correct or wrong? Can you tell if the equation $56+85-7=141-7$ is correct without performing a subtraction?’, which is a relational question. All participants stated that the results on both sides of the equation will remain equal to each other if the same number was subtracted from either side. Stephens et al. (2013) notes a higher level of reasoning is required for this kind of questions regarding the relations between both sides of an equation. In their research, 3rd, 4th and 5th graders were asked ‘It is known that $15+8=23$. Do you think the expression $15+8+12=23+12$ is correct?’ The participants were unable to interpret that to comprehend the equation they were expected to take into consideration the first expression ($15+8=23$). However, participants capable of relational interpretation of an equation stated that adding the same number to both sides of an equation will not break the equation. Very few of the 5th graders were observed to have this interpretation. That all participants displayed a relational interpretation of equations differs from the research conducted by Stephens et al. (2013); the reason for this may be that the participants of our research were all 8th graders. While, Sude, Rümeyisa, Helin, and Ayşe created Scratch activities providing balance, the code created by Furkan included options that provided imbalance.

The fourth question administered to students was ‘Can you tell if the equation $67 + 86 = 68 + 85$ is correct without performing an addition?’ which is a level4 and relational question. Stephens et al. (2013) in his research conducted with the participation of 3rd, 4th and 5th graders concluded that very few of the students provided answers by focusing on the *structure* of the equation. The other participants recorded that they reached to the result by performing operations not by focusing on the structure of the equation. The inspection of the Scratch code blocks shows that while four of the participants (Sude, Ayşe, Rümeyisa & Helin) created code blocks that provide balance, Furkan created code blocks that make the scale lean to right or left. Furkan managed to provide balance, by appointing numbers to the variables in his code block. All four students who created code blocks that provide balance were observed to employ a single *if* in their code blocks.

The inspection of the findings shows that participants mostly provided operational interpretations to operational questions, and relational interpretations to relational questions. Researches show that students tend to interpret equal sign as a symbol that signifies operation and result (Behr et al., 1980; Byrd et al., 2015; Kieran, 1981; Knuth et al., 2005; Knuth et al., 2006). Interpretations of the participants were observed to differ according to the type of the question they were given. Knuth et al. (2005), after conducting a research with the participation of 6th, 7th and 8th graders, states that 8th graders were more likely to provide a relational interpretation of equations compared to 6th and 7th graders. Similarly, Alibali et al. (2007) recorded that the relational interpretation of equations increases as the age of the participant increases, in a lengthwise research on 6th, 7th and 8th graders.

Another finding regarding the interpretation of equal sign is that the participants paid attention to providing balance in their Scratch activities. In the first question, only Sude, and in the second question all participants created code blocks that provided balance. Regarding third and fourth questions, all participants but Furkan created code blocks that provided balance. Even though creating similar code blocks for all questions, Furkan provided balance by creating extra codes for two questions (2nd and 4th). In this context, in accordance with the researches in the field, participants were observed to focus on balance in their double pan scale activities. For example, according to Akkan (2009), in Algebra the equal sign signifies balance. In conclusion, the participants created code blocks using the equal sign to provide the scale to balance.

All participants were Level 4 students, in accordance with the four different levels defined by Matthews et al. (2012). All participants were 8th graders. Further research may be conducted with participants from other grades. Students can be encouraged to use Scratch for various subjects (first-degree equations in one unknown, factorization, first degree inequalities in one variable).

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A General Evaluation on the Piano Works of the Soviet Composer Dmitry Kabalevsky for Children and the Sample of the Piano Album “Thirty Pieces for Kids Op.27”

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Abstract

While it is aimed to form basic behaviors for students in piano education, it is important to develop piano playing skills in a way that will attract the attention of children, with materials suitable for the individual characteristics, age group, perception level, and level of the students. Therefore, it is necessary to choose a balanced and correct repertoire suitable for the level of the student. Choosing the appropriate repertoire is about a careful balancing of skills, physical competence, musical interest, pedagogical value, and the student's emotional maturity. There are many works written for this purpose in our country and the world. In this context, this study aims to examine the place of the piano album "30 pieces for children Op.27" in piano education by making a general evaluation on the piano works for children by Kabalevsky, who has made great contributions to piano education as a composer and educator. The research is a qualitative study and the relevant literature was examined through document analysis and Kabalevsky's piano albums for children, which are used in piano education, were reached. In addition, the composer's piano album “30 pieces for children Op.27” was examined and interpreted in terms of content and technical studies. As a result of the study, Kabalevsky's piano works for children in terms of gaining the behaviors that form the basis of piano education were evaluated and suggestions that could guide piano educators were tried to be developed. Furthermore, it is thought that these works will contribute to the use of piano education, to the introduction of the works, and to diversify the educational repertoire.

Keywords: Piano Education, Piano Works for Children, Piano Repertoire, Kabalevsky

1. Introduction

Piano education is one of the most basic dimensions in all types of music education. This education can be characterized as all the stages applied in order to help the students to acquire new musical, technical and aesthetic behaviors in the behaviors of the individual in an attempt to perform the instrument.

While it is aimed to help the students to acquire the basic behaviors in piano education, it is crucially significant to develop piano playing skills in such a way that will draw the attention of children, with the materials appropriate for the individual characteristics, age group, perception level and level of the students. Therefore, it is essential to select a well-balanced and correct repertoire suitable for the level of the student (Ertem, 2011).

With each new musical piece, the aim should be not only to develop basic behaviors and skills, but also to acquire new and higher-level behaviors, to learn techniques, and as a result of this, to play, recognize and develop works in different sizes and styles (Özer, 2021).

It is vitally significant for the students to use a comprehensive musical vocabulary in order to make the piano education more effective. Therefore, the students should develop themselves technically and musically, be able to play and recognize more comprehensive and different works of piano literature. In the creation of such a musical repertoire, the works of Russian/Soviet composers composed for piano should also be included (Özer, 2021).

The historical development of Russian music changed direction with the occurrence of the Russian revolution in October 1917. With the establishment of the Soviet Union administration, a radical and rapid change process commenced in art and thereby in music as it was the case in every field (Suvat, 2009). Kabalevsky's philosophy of music education stamped its influence on this period.

Dmitry Kabalevsky, as one of the most significant and brilliant composers in the sense of the cultural heritage of the Soviet period, played a part as a composer, pianist, professor, conductor, doctor of art history and teacher in the music history of the twentieth century.

Kabalevsky essentially composed music on patriotic themes. His compositions include many piano works, seven concertos for different instruments, five operas, four symphonies, vocal and chamber music works, and music for theater and cinema (Muzikallnaya Entsyklopedia, 1978).

Dmitry Borisovich Kabalevsky contributed comprehensively to the musical education of the younger generation. He composed many musical plays and songs for children and wrote books. All of the works were works on friendship, love, school, kindness, mutual aid, the Motherland.

The composer devoted a great part of his life to developing projects in an attempt to enable everyone to access the non-formal music education. Kabalevsky wrote compositions that could be easily understood and played by children. As far as Kabalevsky was concerned, song, dance and march were essential forms of music. These three types of music are the simplest forms that children can easily understand and practice because people reveal their feelings, thoughts, movements and actions with songs, dances and marches (Forrest, 1996: 139).

In this study, it was aimed to examine the significance of the piano album "Thirty Pieces for Children Op.27" in piano education by making a general evaluation on the piano works for children by Kabalevsky, who contributed comprehensively to piano education as a composer and educator.

2. Method

In this study, which is qualitative in nature, the descriptive research methods and techniques were utilized. The relevant literature was reviewed through document analysis and Kabalevsky's albums composed for children were accessed. Furthermore, the composer's piano album "Thirty Pieces for Children Op.27" was analyzed and interpreted in terms of content and technical studies.

2.1 Universe and Sample

The universe of the study consisted of piano works composed by Kabalevsky for children. Three albums were selected using the random method from the works accessed through the literature review. A general evaluation of the works in the albums titled "Thirty-five Easy Pieces Op. 89" and "Twenty-Four Easy Pieces Op. 39" was made; The works in the album "Thirty Pieces for Children Op.27" were also analyzed and reported from a technical and musical point of view.

2.2 Data Analysis

A general evaluation of the data obtained from the piano albums that constitute the scope of the research was made. In addition, the information in the piano album “Thirty Pieces for Children Op.27” was included, and the content analysis method was used for the analysis of the work. Then, the musical, technical and theoretical information in the content of this album is presented.

3. Results

When Kabalevsky's piano albums for children were investigated, it was clear that three main music genres (song, dance and march) consisting of small characteristic pieces were utilized.

Furthermore, learning the musical terms for playing the piano in the composer works, knowing, comprehending and remembering the musical components such as rhythm, melody, loudness, time aimed to acquire the cognitive skills related to piano learning. With each new musical piece, Kabalevsky aimed to develop the basic behaviors and skills of the students, as well as to acquire new and higher-level behaviors, to learn the techniques, and as a result, to play, recognize and develop works in different sizes and styles.

Table 1: Kabalevsky “Thirty Pieces for Children Op.27” Piano Album Information Tag

<i>Title</i>	<i>Thirty Pieces for Children Op.27</i>
Available in	Piano Music Series for Children and Teens Volume 3
Date of Composition	1937-1938
Date of First Print	1951
Printing House	Sovetsky Compositor (Soviet Composers)
Place of Publication	Moscow

Table 2: Distribution of the “30 Pieces for Children Op.27” Works by Styles and Tempo

<i>No</i>	<i>Title of the Work</i>	<i>Tempo</i>	<i>Style</i>
1	Waltz Time	Allegretto cantabile	Dance
2	Ditty	Andantino	Song
3	Etude	Allegro Vivace	March
4	A Night on the River	Andantino	Song
5	Playing Football	Vivace leggero	Dance
6	Sad Story	Cantabile	Song
7	An Ancient Dance	Tempo di Menuetto	Dance
8	Lullaby	Moderato cantabile	Song
9	A Little Tale	Allegro moderato	Song
10	Clowning	Vivace	Dance
11	Rondo	Moderato	Song
12	Toccata	Allegretto	Song
13	A Little Joke	Vivace leggero	March
14	Scherzo	Allegro scherzando	Dance
15	March	Allegro	March
16	A Lyrical Piece	Andantino con moto	Song
17	Dancing in the Meadow	Andantino	Dance

18	Sonatina	Allegretto	March
19	War dance	Allegro energico	Dance
20	Fairytale	Andantino cantabile	Song
21	Chase	Allegro moderato	Dance
22	Tale	Andantino	Song
23	Snowstorm	Presto	Dance
24	Etude	Allegro marcato	Dance
25	Novel	Molto sostenuto	Dance
26	Etude	Allegro	March
27	Dance	Moderato scherzando	Dance
28	Capris	Andantino	Song
29	Horseman Songs	Allegro molto	Dance
30	A Dramatic Event	Grave	March

3.1 *“Work Analysis of the Piano Album “Thirty Pieces for Children Op.27”*

The piano album “30 Pieces for Kids Op.27” is one of Kabalevsky's most popular children's albums. The songs in the album are ordered from easy to difficult. The last two works comprise the elements and technical behaviors of all the works in the album. In the seventeen of thirty works in the album, the melody continues in the same hand from beginning to the end. In two works (Nos: 19 and 28), the configuration was expanded into four beats. The six tracks (Nos: 1, 5, 10, 13, 22 and 23) were composed in melodic and rhythmic continuity between two hands. The length and difficulty of the tracks in the album progress gradually. The longest tracks for children are included in this album. Coordination between the two hands and independent hands are the main psychomotor achievements in the works. Furthermore, the wide range of nuances in the tracks draws attention. Other technical elements in the works are the double-point rhythmic patterns and a continuous pedal. The last two tracks (Nos: 29 and 30) are among the most frequently used tracks in concerts.

3.1.1 No:1 Waltz Time - Allegretto cantabile

This track is in G Major tone and consists of 36 measures. It is in dance form and has three beats. The piece should be played fast-paced, just like singing a song. The song is on the right hand and starts with a missing measure. The rhythm in the left hand consists of two eighth notes and one eighth suspense. It is in the form of accompaniment. The first beats should be played a little strongly, as it starts with a missing measure and is three-stroke. Therefore, the rhythm is transmitted correctly. Coordination between hands is important. Attention should be paid to the nuance changes and altered sounds.

3.1.2 No:2 Ditty – Andantino

The piece is in E minor tone and consists of 17 measures. It is in song form and has four beats. It should be played at a slow tempo. It should be vocalized with the legato technique with both hands. It consists of one phrase and two measures. The melody on the right hand is accompanied by chords consisting of two beats. From the fifth to the eighth measure, the melody and accompaniment are switched in the hands. This track can be a march piece for playing the chords on the piano. At the same time, it is a piece that develops finger movements so that the student can play chords consisting of two beats on the piano and switch between two chords. Attention should be paid to the nuances and altered sounds.

3.1.3 No:3 Etude - Allegro Vivace

The piece is in A minor tone and consists of 18 measures. It is in march form and has four beats. It should be played very fast-paced and vivaciously. Hexadecimal notes on the right hand should be regular, even and clear. Finger crossings should be done carefully. In the left hand, there are usually double and monophonic doublet notes. The syncope at measure 6 should be performed correctly. The dynamics play an important role in this track. In each phrase, crescendo and decrescendos continue throughout The piece. A pedal will be used for the first time in this album. The piece starts with p and ends with ff chords with two vocalic sforzando.

3.1.4 No:4 A Night on the River – Andantino

The piece is in B minor tone and consists of 18 measures. It is in song form and has three beats. It should be played at a slow tempo. This track, like the second song in the album, should be performed with both hands using the legato technique. The melody on the right hand is accompanied by the chords consisting of two beats in the left hand. The nuances should be paid attention to.

3.1.5 No:5 Playing Football - Vivace leggero

The piece is in D Major tone and consists of 51 measures. It is in dance form and has three beats. It should be played fast, vivaciously and lightly as a feather. In this track, even though the notes are on different staff, the stems of all the notes were written in conjunction with each other. This type of composition appeared for the first time in this album. The rhythm figure, consisting of two hexes and two eights, is repeated throughout the track. Finger switching technique is applied on a key. This technique is reminiscent of bouncing of a ball. The piece starts with p and ends with an accentuated ff.

3.1.6 No:6 Sad Story – Cantabile

The piece is in F minor tone and consists of 34 measures. It is in song form and has two beats. It should be played just like singing a song. This track is similar in character to the previous two songs. The Legato technique is applied. The song is on the right hand. On the left hand, two- and three-vocal chords provide harmonic support to the melody. Motifs are usually two-measure length. The tenuto (restrain the note) sign is commonly used in this track. From the 25. measure to the last measure, there are jumping chords on the left hand and should be connected with the pedal. The nuances should be paid attention to.

3.1.7 No:7 An Ancient Dance - Tempo di Menuetto

The piece is in A minor tone and consists of 22 measures. It is in the form of menuet, which is an ancient dance form. It is three-stroked. A purple embellishment mark was used for the first time to reveal the baroque period effect of the track. The melody was on the right hand and was written in staccato and non legato techniques. Dual vocals are common. Left hand staccato chords support the harmony in the melody.

3.1.8 No:8 Lullaby - Moderato cantabile

The piece is in C major tone and consists of 37 measures. It is in song form and has two beats. It should be played at medium speed, just like singing a song. Throughout the tract, there is an accompaniment type consisting of four notes on the left hand, reminiscent of a broken chord. The melody is on the right hand and begins after the accompaniment in two measures. Between the 15th measure and the 31st measure, the melody and accompaniment changed places in the hands. As in other songs, phrases are short here. The last 6 bars of the tract consist of quaternary hexadecimal notes and are reminiscent of Coda. Mainly p, dim. and pp nuances are available.

3.1.9 No:9 A Little Tale - Allegro moderato

The piece is in E minor tone and consists of 18 measures. It is in song form and has four beats. It should be played vivaciously, at a moderate pace. The piece is based entirely on the staccato technique. It should be played unison

with an octave difference between the two hands. The chromatic movements and modifiers in the song should be paid attention to.

3.1.10 No:10 Clowning – Vivace

The piece is in F Major tone and consists of 46 measures. It is in dance/toccata form and has two beats. It should be played vivaciously and fast. As the name of the track suggests, it is a fun piece. It is similar in structure to the track number 5. The structure of the track consists of an octal staccato on the left hand and two connected eight beats on the right hand. In this track, even though the connected and cut notes were on different staff, the stems of all notes were written in conjunction with each other. This type of composition was observed previously in part 5. It is necessary to emphasize the strong times in the track with staccato notes on the left hand. There are a wide range of nuances from pp to f in the track.

3.1.11 No:11 Rondo- Moderato

The piece is in C minor tone and consists of 34 measures. It is in march form and has four beats. It should be played at medium speed. This track introduces the rondo form. The work consists of the ABA form. Both hands are rhythmically the same. Attention should be paid to the keys at the beginning. Non legato playing technique is dominant. Left hand decimal range starts from below. Measures 5-8 and 17-24 differ from the first 4 measures in terms of character and rhythmic structure. The right hand plays sequential double tones with triple intervals. The left hand complements the right hand harmonically.

3.1.12 No:12 Toccata- Allegretto

The piece is in A minor tone and consists of 49 measures. It is in the form of a two-part song and has two beats. It should be played at a quick tempo. It has an upbeat and cheerful character. The song is on the left hand. It should be played connected just like singing. The right hand accompanies the left hand in a staccato technique with triphonic chords. Since the chords are played at weak times in some measure, syncope occurs. Attention should particularly be paid to the altered sounds in the B part of the track. The piece, which has a wide range of nuances, is one of Kabalevsky's most played one.

3.1.13 No:13 A Little Joke - Vivace leggero

The piece is in C Major tone and consists of 53 measures. It is in march form and has two beats. It should be played vivaciously and fast. The focus of this track is a group of thirty-two notes consisting of four rows of vocals on the right hand. These notes should be played fast and connected, evenly and lightly. This melodic pattern should be consistent throughout and attention should be paid to continuity. The octal staccatos on the left hand should be the highlight of The piece. In the middle part of the track, the melodic pattern is transferred to the left hand. The nuances are generally light.

3.1.14 No:14 Scherzo- Allegro scherzando

The piece is in B minor tone and consists of 29 measures. It is in dance form and has three beats. It should be played vivaciously, fast-paced and playfully. The feature of this piece has the threefold intervals unison chromatic small sections in the form of staccato. The legato technique that comes after this chromatic staccato reveals the difficulty of the piece. Furthermore, attention should be paid to the changing finger numbers and altered sounds. In the piece, light nuances (p, pp) were used in general.

3.1.15 No:15 March- Allegro (Tempo di Marcia)

The piece is in B flat Major tone and consists of 43 measures. It is in march form and march tempo. It is a two-beat part. Like the previous piece (Scherzo), this piece also includes the staccato technique. Intro and Coda are different and emphatic notes are dominant. In some measures, the emphatic staccato gives the impression of a regular rhythm and pace. The double sounds on the right hand are complemented by the harmonic structure on the

left hand. Two-handed unison six-piece staccatos are spectacular. The composer's work ends with an emphatic *ff*, revealing the character of the piece.

3.1.16 No:16 A Lyrical Piece - Andantino con moto

The piece is in C sharp minor tone and consists of 35 measures. It is in song form and has four beats. It should be played at a slow tempo. The piece begins in the unison legato technique of two hands one octave. The track continues on the right hand. Double-beat and single-beat leaps on the left hand serve as accompaniment. The composer connects these leaps with the pedal. The melody and accompaniment are switched between 12 and 17 measures. Therefore, attention should be paid to the changes in nuances.

3.1.17 No:17 Dancing in the Meadow – Andantino

The piece is in C Major tone and consists of 26 measures. It is in dance form and has four beats. It should be played at a slow tempo. The piece includes two-handed opposing techniques. Another characteristic feature of the piece is the three-beat chords on the left hand with an octave jump. These chords should be played staccato and the leaps should be supported by the pedal. The melody is on the right hand and consists of high notes. It should be played with an expressive legato technique. The piece has a wide touch, covering a four-octave vocal range. As a nuance, light nuances are dominant.

3.1.18 No:18 Sonatina- Allegretto

The piece is in A minor tone and consists of 43 measures. It is in march form and has four beats. It should be played at a quick tempo. It has an upbeat and cheerful character. It is a work in the form of a sonatina, the only one in the four albums written for children. The right hand is dominated by a march-like melody from beginning to end. The composer gives this impression with quatrains and hexadecimals. The students encounter the double dotted notes for the first time. In order to do this, dotted octal-hexadecimals and the double-dotted four-hexadecimals rhythmic patterns should be distinguished and applied carefully. The left hand accompaniment consists of three-beat staccato chords in weak intervals. In accordance with its general structure, the piece should be played sharply and angularly, giving the impression of an anthem. The *p subito* nuance in the middle section adds a softness to the piece. Attention should be paid to the following chromatic triphonic chords. The piece that continues with the A section returns to the beginning character and ends with dotted notes on the left hand and in the *pp* nuance.

3.1.19 No:19 War dance - Allegro energico

The piece is in F minor tone and consists of 26 measures. It is in dance form and has four beats. It should be played fast-paced and energetically. The rhythmic pattern consists of eighth, two hexadecimals, and six eighth staccato notes. The phrases ending with two strong chords resemble a trumpet call. The melody between the hands in the 5th and 7th measures resembles the canon. In the piece, the melody continues with hexadecimals and triple unison intervals. Towards the end of the piece, four-vocal textures emerge. Attention should be paid to the vocals holding in both hands. The piece starts at *f* and ends with the nuance *pp*.

3.1.20 No:20 Fairytale - Andantino cantabile

The piece is in E flat Major tone and consists of 37 measures. It is in song form and has four beats. It should be played slowly, just like singing a song. The tune is on the right hand and begins as a tenuto with a repeated note. The left hand accompanies with the arpeggio chords. Arpeggios consisting of these four vocals are connected with the pedal and complete the harmony. The pedal in the piece is used in the same way throughout. There is a wide range of nuances in the work, from *pp* to *f*.

3.1.21 No:21 Chase - Allegro moderato

The piece is in G minor tone and consists of 44 measures. It is in dance form and has four beats. The piece should be played vivaciously at a moderate pace. The feature of this work is the rhythmic patterns. In the piece where the triads are used comprehensively, the two hand unison is played with an octave interval. Attention should be paid to the altered sounds. The track starts with *mf* and ends with crescendo and emphatic *ff*.

3.1.22 No:22 Tale – Andantino

The piece is in F sharp minor tone and consists of 49 measures. It is in song form and has two beats. The piece should be played at a slow tempo. It is a long piece with various nuances and different harmonic transitions. A wide keyboard is used in the piece. The rhythmic pattern is in two hexadecimal and octal form. The piece is in the right hand. The accompaniment is played on the left hand with the main pattern. The key changes should be noted. In the middle of the piece, there are two hand unison six intermittent melodies.

3.1.23 No:23 Snowstorm – Presto

The piece is in G minor tone and consists of 88 measures. It is in dance form and has two beats. It should be played fast-paced. It is a long piece with wide and contrasting (*subito*) nuances. The piece is on the left hand. The rhythmic pattern consists of three rows of octal and octal figures. The left hand accompanies the quatrain with two eighth notes. The rhythm in both hands does not change from beginning to end until three measures. The piece is dominated by the legato technique.

3.1.24 No:24 Etude - Allegro marcato

The piece is in F Major tone and consists of 46 measures. It is in dance form and has four beats. It should be played vivaciously at an emphatic tempo. The rhythmic mold consists of two triads and two quatrains. Both hands have the same rhythmic mold. At the beginning of the piece, the right hand continues with a line of broken chords, while the left hand plays rows of vocals. In the middle part, two hands unison play the arpeggios in the legato technique with an octave interval. The piece ends with two chords at *sff*.

3.1.25 No:25 Novel - Molto sostenuto

The piece is in D minor tone and consists of 58 measures. It is in dance form and has two beats. It should be played slowly and solemnly. The melody is on the right hand and generally consists of triple-intermittent double vocals. Motifs and phrases begin with an incomplete measure. For this, strong periods should be played emphatically. The left hand is accompanied by the double-voice chords with an octave leap. These leaps must be connected with the pedal. The piece is a development of the left hand leaps in piece 16. It is a piece with a wide range of nuances from *ppp* to *ff*. It resembles a barcarolle in terms of rhythm and melody.

3.1.26 No:26 Etude – Allegro

The piece is in A Major tone and consists of 105 measures. It is in starter form and has two beats. It should be played fast-paced. This is the longest track on the album. It is similar to the piece no. 24 (Etude) as a rhythmic mold. This pattern consists of triplets and dotted octal hexadecimal. Left hand is in the form of broken arpeggio of chords. The middle part of the piece includes right-handed trilogies, sometimes parallel lines, and sometimes left-handed quatrains. In this work, the composer used pedals and a wide range of nuances.

3.1.27 No:27 Dance- Moderato scherzando

The piece is in D minor tone and consists of 56 measures. It is in dance form and has two beats. It should be played at an upbeat, medium tempo. The piece consists of octal staccato notes. It starts with a missing measure and needs to be played a little louder to emphasize the first beat. The melody is on the right hand and is played as a double-voice parallel trio. Accompaniment on the left hand begins with a single vocal staccato. From time to time it is responded with a parallel trio like the right hand. There is a tempo change in the middle part of the piece. This part

is played vivaciously and fast-paced. It then returns to a tempo. The track starts at mf. It goes through different nuances and ends in pp.

3.1.28 No:28 Capris- Andantino

The piece is in E Major tone and consists of 71 measures. It is in song form and has two beats. The piece should be played at a slow tempo. The feature of the piece is that it is the only vocal that lasts long in both hands, while the other vocals should be played staccato. Single vocals with tenuto sign usually move along the 1st and 5th fingers. All vocals were composed with a unison octave interval from beginning to end.

3.1.29 No:29 Horseman Songs - Allegro molto

The piece is in B flat minor tone and consists of 63 measures. It is in dance form and has two beats. It should be played vivaciously and fast-paced. This and the next track can be called a technical summary of all the tracks on the album. The work has a toccata-like character. The piece is predominantly on the left hand. The track starts with f. Two measures later, it is performed as p sub. with accompanying syncope. In the middle part of the piece, a third vocal texture is added with the legato technique. The tune moves to the upper vocal. The lower two vocals are in the form of accompaniment. There is also a wide range of nuances in this work.

3.1.30 No:30 A Dramatic Event – Grave

The piece is in F minor tone and consists of 73 measures. It is in starter form and has two beats. It should be played slowly and comprehensively. It is the last and slowest track on the album. The piece starts with the missing measure and is played with the legato technique. A large keyboard is used. There are double-point octal and thirty-two as the rhythmic pattern. The piece sounds like an echo between two hands at first. Sometimes the melody continues in the form of two hands unison six, octave and triple intervals. There are chords on both hands in the middle part of the piece. The composer gave a dramatic effect to the piece by using pedals. There is also a wide range of nuances in this work. The track starts with mf. f goes through pp and p and ends with ff. This and the preceding track contain many of the elements and technical challenges introduced in the album.

4. Discussion

In the present study, the general characteristics of the piano music composed by Kabalevsky for children were presented and the work "Thirty Pieces for Children Op.27" was investigated from an educational point of view. The works were determined according to the genre and style of the song, dance or march, classified, and analyzed musically and technically.

As a result of the analyses, it was revealed that Kabalevsky's piano music composed for children and young people included a wide variety of technical and musical elements. The technical behaviors acquired in the pieces can be summarized as follows: The independent coordination between the two hands, intervals, playing chords and arpeggio, hand positions and pedaling. The musically acquired behaviors, on the other hand, were the rhythm, expression, tempo, dynamics, innovations etc. Each piece contained at least one new technical or musical element. In some works, the student encountered both technical and musical innovations. Another feature of the parts was that each part evolved over the previous parts.

When the piano album "Thirty Pieces for Children Op.27" was examined, the following conclusions were obtained:

1. The subjects learned and wished to be implemented progressed systematically from simple to complex.
2. New knowledge and implementations were combined with what they had learned previously in an attempt to facilitate students' comprehension.
3. It was thought that the incorporation of basic music knowledge subjects on the pieces both supported systematic progress and would enable the students to learn more easily through practice.

4. In order to enable effective and permanent learning in the students, new knowledge is incorporated in the new piece together with the behaviors acquired in the previous pieces. Therefore, in addition to more practice, the students managed to able to internalize the new learned subject better.

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The Kolb Learning Styles of History Undergraduates in Türkiye

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Abstract

This study investigated the learning styles of history students depending on some demographic variables. The sample consisted of 1849 students from seven history-teaching (n=875) and eight history departments (n=974) of ten universities in different regions of Türkiye. Data were collected using a personal information form and the Kolb Learning Styles Inventory (KLSI-3). According to Kolb's classification of four learning styles, participants had assimilating, converging, diverging, and accommodating learning styles, respectively. According to Kolb's classification of nine learning styles, seven in ten participants had balancing, reflecting, thinking, and analyzing learning styles. The study investigated whether the variables of "university," "major," "gender," "age," and "grade level" affected participants' "learning modes" [concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), active experimentation (AE)], "perceiving information" (CE-AC), and "processing information" (RO-AE) scores. The results showed that the variable of "university" affected what learning styles participants adopted. Participants from seven universities adopted balancing learning styles, while those from the other universities adopted reflecting learning styles. The variable "major" affected participants' CE, RO, and AC scores. The variable "gender" affected their RO, AE, and "processing information" scores. The variable "age" affected their CE, AC, AE, and "perceiving information" scores. The variable "grade level" affected all their scores except for nine learning styles and CE.

Keywords: Educational Specialization, Experiential Learning Model, History Undergraduates, Kolb's Learning Style Inventory (KLSI), Learning Styles

1. Introduction

Learning is affected by numerous factors. Everybody learns differently depending on developmental characteristics, environmental variables, prior knowledge, learning motivation, past experiences, sociocultural background, etc. (Erden, & Altun, 2006). Educators should be aware of those factors to facilitate learning for life-long learners (Kolb, & Kolb, 2005). Educators should recognize the importance of individual differences and learning styles and integrate appropriate activities into curricula (Cassidy, 2004).

Since the second half of the 1900s, researchers have focused more and more on individual differences because there has been a growing body of research on the psychological and educational aspects of learning (Veznedaroğlu, & Özgür, 2005). For example, Coffield et al. (2004) advocate that we should consider individual differences to promote students' learning. Moreover, new concepts were born out of individual differences, such as mental performance, learning orientations, and learning styles (Ekici, & Kurt, 2013; Felder, & Brent, 2005). Learning styles have been studied since the 1920s when Carl Jung proposed his theory of personality types (Sternberg, & Grigorenko, 1997). However, the field witnessed a continual accumulation of a body of knowledge around learning styles between the late 1950s and early 1970s (Yeşilyurt, 2014).

Rita Dunn was the first to use the term "learning styles." She defines them as ways of using different and idiosyncratic tactics when learning or preparing to learn a piece of new and challenging information (Boydak, 2015; Dunn, & Dunn, 1975). In the following years, scholars defined learning styles differently. For example, Kefee and Dunn define them as personal and distinctive characteristics that indicate how to act in learning settings. According to Keefe (1979), learning styles are "the composite of characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment" (Sandhu, Fong, & Rigney, 1996). Reinert (1976) defines learning styles as some kind of internal programs that regulate our behavior. For Entwistle, Kolb, and Schmeck, learning styles are psychological constructs that emerge in learners' behaviors that overlap with their dispositions. Kolb argues that people learn from their experiences. Ideas are not fixed elements of thoughts as they are reshaped by experiences (Kolb, 2014). Kolb's experiential learning theory is based on learning processes. He defines learning styles as the ways in which learners prefer to use their abilities in experiential learning (Gencel, 2007; Kolb, 1984). It is noteworthy that Felder and Silverman (1988) also emphasize "preferences" when they define learning styles as the characteristic strengths and preferences in the ways individuals take in and process information.

Researchers have focused more and more on learning styles as they have come up with the idea that individual differences are the wealth of learning settings. Therefore, Gencel (2007) maintains that we should identify students' learning styles and provide them with education accordingly to help them achieve permanent learning. Moreover, if one knows how one learns, one is more likely to adopt that learning style to learn more easily and quickly (Metin, Yılmaz, Birişçi, & Coşkun, 2011). In other words, learners who know how they learn are more likely to build up confidence in their learning (Kazu, 2009: 90). Therefore, learning styles are instrumental in helping learners discover how they learn (Carol, 2015). Learning styles are not the only factors affecting learning at different levels but are critical components of learning/teaching processes. Everybody adopts the best learning style to learn something because they have some idea of how they learn best. If there is a mismatch between the learning style and the learning environment, one is likely to reject or oppose that style (Kolb, 2014).

Teachers need to know what learning styles their students adopt because they need to plan lessons accordingly to provide equal and effective teaching (Sandhu, 1996). Nulty and Barrett (1996) argue that learning styles are not only the epistemology of a discipline, but they also affect the related educational processes. Therefore, they state that learning styles are not necessarily a result of the discipline per se but also of the way they are taught. Instructional plans suited to learning styles have different benefits: they (1) help students learn better, (2) allow teachers to answer questions about how to plan their lessons, and (3) encourage educators to prepare curricula by taking into account general learning approaches (Başibüyük, Sülün, Bahar, & Kışoğlu, 2011). Clark and Latshaw (2012) emphasize that research on educational programs and learners' performance should not ignore what teaching styles teachers prefer. Teachers who know what teaching styles they adopt and what advantages and disadvantages they have can undertake more efficient learning-teaching processes (Gencel, 2013). If teachers match students' learning styles with topics, students can use different learning styles to complete learning tasks and improve themselves (Kazu, 2009). Activities that are appropriate for learning styles both give clues to teachers and help students perform better (Başibüyük et al., 2011) because the latter choose study behaviors according to environmental and personal factors and forms of discourse. In other words, activities that are appropriate for learning styles allow students to choose study behaviors more comfortably (Nulty, & Barrett, 1996). In addition, learning styles explain why everyone learns differently, enabling them to take learning processes under control.

This is because one's ability to take responsibility for one's learning is an essential indicator of learning to learn. This is the only way to acquire ever-changing knowledge by oneself (Güven, & Kürüm, 2006).

1.1. Experiential Learning Model and Kolb's Learning Styles

Many measurement tools focus on different dimensions of learning styles (Cassidy, 2004; Dierking, 1991; Romanelli, Bird, & Ryan, 2009; Veznedaroğlu, & Özgür, 2005; Yadav, & Shukla, 2021). For example, the classification of learning styles in the Experiential Learning Theory developed by David Kolb has an important place in the educational sciences literature (Gencel, 2007). Kolb's Learning Style Inventory (KLSI) is different from other learning-style and personality tests because it is based on a comprehensive theory of learning and development. Kolb bases his model on how human experiences are transformed into concepts and how transformations help people select new experiences (De Bello, 1990).

An essential principle of Experiential Learning Theory is that everybody learns differently (Gencel, 2008). Some turn concrete representations into abstract concepts, some reflect on concepts, some work on concrete objects, and some involve their emotions in the process (McCarthy, 1997). Kolb's theory stipulates that learning consists of four interconnected structures:

“Concrete experience (CE) involves using direct experience, feelings, and emotions to engage with the world. Reflective observation (RO) involves looking back on the extant experience, recollecting details of the experience, and gathering new information about the experience; (3) Abstract conceptualization (AC) involves creating meaning out of the experience and creating plans to guide future actions; (4) Active experimentation (AE) involves testing the plan by putting it into action (Kayes, 2005).”

The vertical axis in Kolb's model represents a continuum of preferences for how information is perceived, ranging from grasping "concrete experiences" to "abstract concepts" (a combination of CE-AC). The horizontal axis represents how once-perceived information is turned into meaning. At one end is "reflective observation," and at the other end is "active experience" (a combination of RO-AE). The intersection of those two continuums creates Kolb's four main learning styles (Given, 1996). These two independent dimensions support each other. Learning styles are determined by combining scores from the CE/AC and AE/RO modes. These four styles are called diverging (CE/RO), assimilating (RO/AC), converging (AC/AE), and accommodating (AE/CE). In this way, we can identify one's learning style. These four styles follow each other in a cycle (Figure 1).

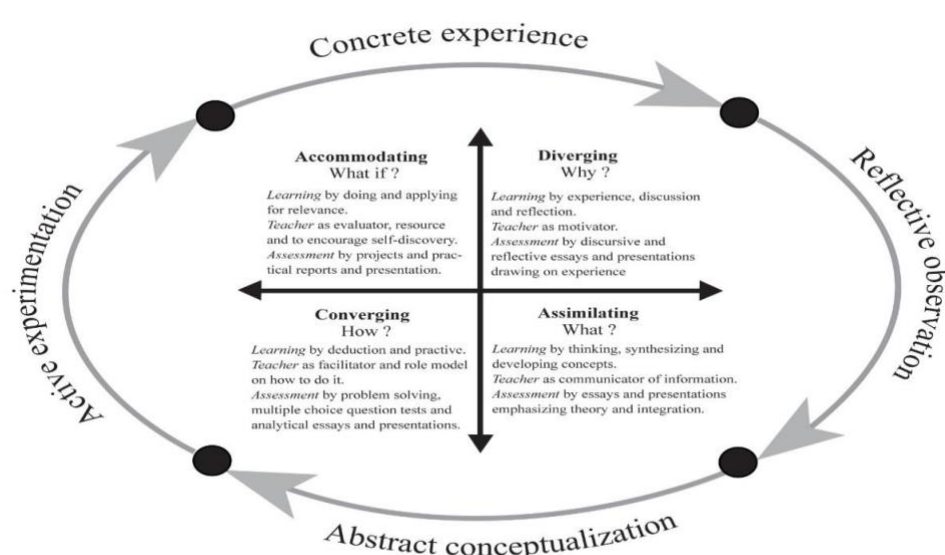


Figure 1: Teaching, Learning, and Assessment Activities Suitable for Kolb's Learning Styles (Özdemir, 2015: 84)

When the cycle starts, learners have a concrete experience that involves them emotionally, and then they begin reflecting on the experience from different perspectives (Mansfield, & Murrell, 1991). The learning cycle should first be structured from concrete experience to reflective observation and then from abstract conceptualization to active experience (Kolb, 1984). If teachers think of the learning cycle as a conical structure rather than as simple stages to be followed in sequence, the experiential learning model serves students' best interests and thus helps them develop higher-order thinking skills (Kolb, & Kolb, 2005). One can enter the cycle at any point, but one must follow the stages in sequence. In this way, the learning cycle provides feedback, which is the basis for evaluating a new action and its consequences (Healey, & Jenkins, 2000). Learning occurs when one uses one or more of the four modes to solve a learning problem.

1.2. Interdisciplinary Differences in Learning Styles

Culture, personality type, educational specialization, career choice, and current job roles and tasks influence learning styles (Kolb, & Kolb, 2013; Kolb, 1984). Research on interdisciplinary differences in learning styles shows that experiences with education help students develop positive attitudes towards specific learning skills, learn how to learn, and adopt individual learning styles. Bradbeer (1999) states that the principal axes of disciplinary differentiation are also the basis of learning styles. Therefore, he does not find it surprising that students gravitate towards disciplines appropriate to their learning styles. Alice Y. Kolb (2005) argues that people with the same profession adopt different learning styles because they have different experiences during their undergraduate years. Kolb (2014) also maintains that what learning styles students adopt depends on the processes of choosing a discipline and socializing during their undergraduate years.

According to Kolb (1984), specializing in education and social work is characterized by accommodating learning styles, specialization in medicine and engineering is characterized by converging learning styles, specialization in humanities and social sciences is characterized by diverging learning styles, and specialization in mathematics and natural sciences is characterized by assimilating learning styles. Kolb, Boyatzis, and Mainemelis (2014) also found a relationship between learning styles and areas of specialization. They reported four findings based on the results of earlier research. First, people majoring in art, history, political science, English, and psychology are more likely to adopt diverging learning styles. Second, people majoring in abstract and applied fields (medicine and engineering) are more likely to adopt converging learning styles. Third, people majoring in education, communication, and nursing are more likely to adopt accommodating learning styles. Fourth, people majoring in math and physics are more likely to adopt assimilating learning styles. Jones, Reichard, and Mokhtari (2003) found that students majoring in English, math, science, and social studies had interdisciplinary differences in dominant learning styles.

Studies using the KLSI-TR reported that specialization areas were associated with specific learning styles. Aşkar and Akkoyunlu (1993) found that most participants specializing in social and natural sciences adopted assimilating learning styles, while most participants specializing in engineering adopted converging learning styles. Gürpınar, Hilal, and Tetik (2011) found that most medical students adopted assimilating and converging learning styles. Özdemir (2015) determined that most Turkish preservice geography teachers adopted assimilating and converging learning styles. Alp, Uzuner, and Sertbaş (2020) reported that most students from sports sciences faculties adopted diverging learning styles. Çelikler (2020) found that most Turkish undergraduate chemistry students had converging and assimilating learning styles, while Güneş (2018) reported that most Turkish undergraduate biology students adopted assimilating learning styles. Most preservice teachers adopt assimilating learning styles, but their learning styles depend on their majors. For example, Özdemir and Kesten (2012) determined that most preservice social studies teachers adopted assimilating and converging learning styles, while Numanoğlu and Şen (2007) found that most students majoring in computer and instructional technologies adopted converging learning styles. Demir (2008) found that most preservice Turkish teachers adopted converging and assimilating learning styles.

Bulut and Hasırcı (2012) also documented that almost four in five social studies teachers adopted converging and assimilating learning styles.

There are very few studies on the learning styles of history students in the literature on the subject. According to Colins (1999; cited in Gencel, 2008), education based on experiential learning theory helps college students achieve high performance in history classes, which does not depend on their learning styles. Carol (2015) used the KLSI, revised by Honey and Mumford (2006), to determine the learning styles of first-year history students at the University of Bucharest. He found that most students had “reflector” and “theorist” learning styles, while only a few students had an “activist” learning style. Elban (2018) used the Grasha-Reichmann Learning Style Scale to determine the relationship between preservice history teachers’ learning styles and academic performance.

This study investigated the learning styles of history students depending on some demographic variables. We think our results will contribute to the literature and pave the way for further research. The sample consisted of 1849 students from seven history-teaching (n=875) and eight history departments (n=974) of ten universities in different regions of Türkiye. Data were collected using a personal information form and the Kolb Learning Styles Inventory (KLSI-3).

1.3. Research Hypotheses

1. Which learning styles have most participants adopted according to Kolb's classification of four and nine learning styles?
2. Do demographic variables (gender, age, university, department, grade level, etc.) affect participants’ “learning modes” (CE, RO, AC, AND AE), “perceiving information” (CE/AC), and “processing information” (RO/AE) scores?

The study sought answers to the following subproblems:

1. Do participants' learning styles differ by demographic variables (gender, age, university, department, grade level, etc.)?
2. Do participants’ “learning modes” (CE, RO, AC, and AE) scores differ by their demographic variables (gender, age, university, department, grade level, etc.)?
3. Do participants’ “perceiving information” (AC-CE) scale scores differ by their demographic variables (gender, age, university, department, grade level, etc.)?
4. Do participants’ “processing information” (AE-RO) scale scores differ by their demographic variables (gender, age, university, department, grade level, etc.)?

2. Method

This quantitative study adopted a general survey model. The sample consisted of 1849 students from seven history-teaching (n=875) and eight history departments (n=974) of ten universities in different regions of Türkiye.

Table 1: Descriptive Characteristics

Universities	F %	Departments		Total
		History- teaching	History	
Van Yüzüncü Yıl University (VYYU)	N	100	136	236
	%	42	58	13
Dokuz Eylül University (DEU)	N	128	101	229
	%	56	44	12
Dicle University (DU)	N	115	121	236
	%	49	51	13

Gazi University (GU)	N	114	121	235
	%	49	51	13
Marmara University (MU)	N	116	0	116
	%	100	0	6
Atatürk University (ATAU)	N	169	118	287
	%	59	41	16
Necmettin Erbakan University (NEU)		133	0	133
	%	100	0	7
Ondokuz Mayıs University (OMU)	N	0	143	143
	%	0	100	8
Akdeniz University (AU)	N	0	85	85
	%	0	100	5
Balıkesir University (BU)	N	0	149	149
	%	0	100	8
Gender				
Man	N	430	464	894
	%	49	48	48
Woman	N	445	510	955
	%	51	52	52
Grade Level (year)				
First	N	190	246	436
	%	22	25	24
Second	N	188	258	446
	%	22	27	24
Third	N	160	239	399
	%	18	25	22
Fourth	N	164	231	395
	%	19	24	22
Fifth	N	173	0	173
	%	20	0	9
Age (year)				
17-19	N	169	160	329
	%	19	16	18
20-22	N	451	610	1061
	%	52	63	57
23-25	N	255	204	459
	%	29	21	25
Total	N	875	974	1849
within departments	%	47	53	100

The “history-teaching” group consisted of 430 men (49%) and 445 women (51%), while the “history” group consisted of 464 men (48%) and 510 women (52%). Students in the history teaching departments of faculties of education in Türkiye study for five years. Therefore, the sample included 173 fifth-year students from history-teaching departments.

2.1. Data Collection and Analysis

The data were collected using a personal information form and the Kolb Learning Styles Inventory (KLSI-3). The personal information form consisted of sociodemographic items on gender, major, grade level, age, etc. The Kolb Learning Styles Inventory was developed by Kolb (1971). Many researchers have used the inventory on samples from different countries. Kolb revised the inventory several times. However, the items in KLSI 2 and its later versions (KLSI 3, KLSI 3.1, and KLSI 3.2) remained the same. He only made changes in normative sampling, coding, and learning style names but kept the rationale of the inventory as it was. He mainly modified how the scale scores were evaluated.

The Kolb Learning Styles Inventory-2 was adapted into Turkish by Aşkar and Akkoyunlu (1993). However, this study employed the KLSI 3, which was adapted into Turkish by Gencel (2007). The inventory (version 3) consists of 12 items, each with four options rated on a four-point Likert-type scale. The total score ranges from 12 to 48. The scores of the "learning modes" (CE, RO, AC, and AE) are calculated. Then, AC-CE and AE-RO equations are used to calculate the combined scores, ranging from -36 to +36. A positive AC-CE score indicates abstract learning, while a negative AC-CE score indicates concrete learning. An AE-RO score indicates active or reflective learning (Kolb, & Kolb, 2005a; Gencel, 2007; Diken, 2019).

Experimental and clinical research shows that the classification of nine learning styles is better at identifying learning styles than the classification of four learning styles because the former causes less confusion than the latter. A.Y. Kolb (2013) recruited a larger and more diverse sample with higher representative power ($n=6977$) to test the psychometric properties of the KLSI 3.1 and 3.2. The format, items, scoring, and interpretation booklet of the KLSI 3.2, the version of the scale revised in 2013, are the same as the KLSI 3. The KLSI 3.2 provides reference ranges for identifying Kolb's nine learning style types. The intercept scores of the KLSI 3.2 are as follows (Kolb and Kolb, 2013, p. 46):

Initiating	AC-CE <2	AE-RO > 11
Experiencing	AC-CE <2	AE-RO >0 and <12
Imagining	AC-CE <2	AE-RO <1
Reflecting	AC-CE >1 and <13	AE-RO <1
Analyzing	AC-CE >12	AE-RO <1
Thinking	AC-CE >12	AE-RO >0 and <12
Deciding	AC-CE >12	AE-RO >11
Acting	AC-CE >1 and <13	AE-RO >11
Balancing	AC-CE >1 and <13	AE-RO >0 and <12

The nine learning styles were manually calculated based on these reference ranges. Many researchers have established the validity and reliability of the KLSI. Kayes (2005, p. 255) stated that the CE, RO, AC, and AE scores were at acceptable levels. Gencel (2006) provided information on the reliability of the Turkish version of the KLSI 3 and reported that the learning modes (CE, RO, AC, & AE) had reliability coefficients of 0.71 to 0.80.

A non-parametric test (chi-square) was used to determine the relationship between learning styles and demographic variables because learning styles take nominal values. On the other hand, the scores of the learning modes (CE, AC, RO, & AE) and the combined scores of the AC-CE and AE-RO take numerical values based on the scale data. Therefore, we need to conduct a normality test to determine whether the data are normally distributed. The scores of the learning modes have the same or similar arithmetic means, modes, and medians. Moreover, skewness and kurtosis values are close to 0 and between -1 and +1. Skewness and kurtosis values in the range of -2 to +2 indicate normal distribution (Mallery and George, 2000). In addition, the histograms and normal q-q plot graphs of the scores of the learning modes show that it may be appropriate to use parametric tests for data analysis. Based on these results, parametric tests were used for data analysis. Independent sample t-test was used for bivariate comparisons, while One-way analysis of variance (ANOVA) was used for three or more variables. A Scheffe's test was used to make posthoc comparisons to determine the source of significant differences.

3. Results

3.1. The Effect of Independent Variables on Learning Styles

3.1.1. University

Almost half of the participants adopted assimilating learning styles ($n=834$; 45%). More than a quarter of the participants adopted converging learning styles ($n=539$; 29%). Less than a quarter of the participants adopted diverging ($n=320$; 17%) or accommodating ($n=156$; 9%) learning styles. The chi-square test based on four learning styles showed that university affected participants' learning styles [$\chi^2=65.31$; $p=0.015$; $p<0.05$]. Table 2 shows that only 156 participants adopted accommodating learning styles. Most participants from the MU ($n=116$) adopted either converging ($n=50$, 45%) or assimilating learning styles (38%; $n=45$). Most participants from all universities but the OMU adopted assimilating or converging learning styles. Most participants from the OMU ($n=143$) adopted assimilating ($n=68$; 47%) or diverging ($n=41$, 29%) learning styles. According to the classification of nine learning styles, more than half of the participants adopted balancing ($n=411$, 22%), reflecting ($n=340$, 18%), or thinking ($n=297$, 16%) learning styles. Participants from all universities but the MU adopted initiating ($n=34$, 2%) and deciding ($n=74$, 4%) learning styles the least. The chi-square test based on nine learning styles showed that university affected participants' learning styles [$\chi^2=162.68$; $p=0.000$; $p<0.05$]. Participants from seven universities (VYYU, DEU, DU, MU, AU, ATAU, and BU) adopted balancing learning styles the most, while those from three universities (GU, NEU, and OMU) adopted reflecting learning styles the most.

Table 2: The Distribution of Learning Styles by University (chi-square)

University	F %	Div ergi ng	Ass imil atin g	Co nve rgin g	A c c o m m o d a t i n g	Initiat ing	Exp erie ncin g	Ima gini ng	Ref lect ing	An aly zin g	Thi nki ng	Dec idin g	Act ing	Bal anc ing
VYYU	N	30	97	85	24	5	21	13	32	20	45	14	32	54
	%	13	41	36	10	2	9	6	17	7	19	6	14	23
DEU	N	36	121	52	20	3	21	22	47	39	33	3	10	51
	%	16	52	23	9	1	9	10	21	17	14	1	4	22
DU	N	40	101	70	25	4	18	20	40	19	46	9	16	64
	%	17	42	30	11	2	8	9	17	8	20	4	7	27
GU	N	47	111	57	20	5	27	24	51	25	40	7	8	48
	%	20	47	24	9	2	12	10	22	11	17	3	3	20
MU	N	14	45	50	7	3	4	7	14	13	26	15	5	29
	%	12	38	43	6	3	3	6	12	11	22	13	4	25

ATAU	N	57	110	92	28	7	21	33	51	35	33	8	35	64
	%	20	38	32	10	2	7	12	18	12	12	3	12	22
NEU	N	23	63	35	12	2	13	12	28	21	18	7	10	22
	%	17	47	26	9	2	10	9	21	16	14	5	8	17
OMU	N	41	68	30	4	2	7	25	43	11	19	3	8	25
	%	29	47	21	3	1	5	18	30	8	13	2	7	18
AU	N	14	35	29	7	2	3	12	11	12	12	4	8	21
	%	17	41	34	8	2	4	14	13	14	14	8	9	25
BU	N	18	83	39	9	1	8	11	23	32	25	6	10	33
	%	12	56	26	6	1	5	7	15	22	17	4	7	22
Total	N				1									
		320	834	539	56	34	143	179	340	227	297	76	142	411
	%	17	45	29	9	2	8	10	18	12	16	4	8	22
		$\chi^2=6565.31$; $p=0.015^*$				$\chi^2=162.68$; $p=0.000^*$								

3.1.2. Major

Less than half of the participants majoring in history teaching had assimilating learning styles (44%). More than a quarter of the participants majoring in history teaching had converging learning styles (32%). Less than a quarter of the participants majoring in history teaching had diverging (15%) or accommodating (9%) learning styles. Less than half of the participants majoring in history had assimilating learning styles (46%). More than a quarter of the participants majoring in history had converging learning styles (27%). Less than a quarter of the participants majoring in history had diverging (19%) or accommodating (8%) learning styles. The chi-square test based on four learning styles showed that major affected participants' learning styles [$\chi^2=10.597$; $p=0.014$; $p<0.05$]. Participants majoring in history teaching had balancing learning styles the most, followed by thinking (18%), reflecting (17%), analyzing (12%), acting (9%), imaging (8%), and experiencing learning styles (7%). Participants majoring in history had balancing learning styles the most, followed by reflecting (20%), thinking (15%), imaging (11%), analyzing (11%), experiencing (8%), and acting learning styles (7%). There was a significant difference between the groups according to nine learning styles [$\chi^2=26.291$; $p=0.001$].

Table 3: The Distribution of Learning Styles by Major (chi-square)

Major	F/ %	Di ver gin g	As sim ilat ing	Co nve rgi ng	Ac co mm oda ting	Init iat ing	Ex per ien cin g	Im agi nin g	Ref lect ing	An aly zin g	Thi nki ng	De cid ing	Act ing	Bal anc ing	Tot al
History teaching	N	13	38	28	79	17	63	68	15	12	15	45	78	17	875
	%	15	44	32	9	2	7	8	17	12	18	5	9	20	100
History	N	18	45	25	77	17	80	11	19	10	14	31	64	23	974
		8	0	9				1	0	5	1			5	

%	19	46	27	8	2	8	11	20	11	15	3	7	24	100
$\chi^2 = 10.597$; $p = 0.014^*$					$\chi^2 = 26.291$; $p = 0.001^*$									

3.1.3. Gender

Less than half of the male participants had assimilating learning styles ($n=369$; 41%). More than a quarter of the male participants had diverging ($n=182$; 20%) or converging learning styles ($n=254$; 29%). Less than a quarter of the male participants had accommodating learning styles ($n=89$; 10%). Almost half of the female participants had assimilating learning styles ($n=465$; 49%). More than a quarter of the female participants had converging learning styles ($n=285$; 30%). Less than a quarter of the female participants had diverging ($n=138$; 14%) or accommodating learning styles ($n=67$; 7%). More female participants ($n=465$; 49%) adopted assimilating learning styles than their male counterparts ($n=369$; 41%). On the other hand, more male participants adopted diverging and accommodating learning styles than their female counterparts. The chi-square test results based on four learning styles showed a significant difference between male and female participants [$\chi^2 = 19.995$; $p = 0.00$; $p \leq 0.05$]. Both male and female participants had balancing, reflecting, and thinking learning styles the most. There was also a significant difference in the distribution of the other learning styles between male and female participants [$\chi^2 = 21.099$; $p = 0.007$].

Table 4: The Distribution of Learning Styles by Gender (chi-square)

Gender	F/ %	Div ergi ng	Ass imi lati ng	Co nve rgi ng	Acc om mo dati ng	Init iati ng	Ex peri enc ing	Ima gini ng	Ref lect ing	An aly zin g	Thi nki ng	De cidi ng	Act ing	Bal anc ing	Tot al
Male	N	182	369	254	89	20	72	108	163	99	123	35	75	199	894
	%	20	41	29	10	2	8	12	18	11	14	4	8	22	100
Female	N	138	465	285	67	14	71	71	177	128	174	41	67	212	955
	%	14	49	30	7	2	7	7	19	13	18	4	7	22	100
$\chi^2 = 19.995$; $p = 0.000^*$						$\chi^2 = 21.099$; $p = 0.007^*$									

3.1.4. Age

Participants were divided into three age groups: 17-19 years of age (Group 1), 20-22 years of age (Group 2), and $23 \geq$ years of age (Group 3) (Table 5). Participants of all age groups had assimilating learning styles the most, followed by converging, diverging, and accommodating learning styles. Proportionally, the converging learning style was more dominant in Group 1 ($n=104$, 32%) and Group 2 ($n=145$, 32%) than in Group 3 ($n=290$, 27%). The difference between the age groups was significant according to both four and nine learning styles [$\chi^2 = 14.87$; $p = 0.028$ and $\chi^2 = 25.899$; $p = 0.045$; $p < 0.05$]. The proportional distribution of the nine learning styles was similar in all age groups. Balancing was the most dominant learning style in all age groups. However, the reflecting learning style was more dominant in Group 2 (20%) than in Groups 1 (15%) and 3 (17%). On the other hand, the acting learning style was more dominant in Group 3 (11%) than in Groups 1 (8%) and 2 (6%).

Table 5: The Distribution of Learning Styles by Age (chi-square)

Age groups	F/ %	Diverging	Assimilating	Converging	Accommodating	Initiating	Experiencing	Imagining	Reflecting	Analyzing	Thinking	Deciding	Acting	Balancing	Total
17-19	N	55	14	10	29	8	30	29	50	45	53	17	26	71	329
	%	17	43	32	9	2	9	9	15	14	16	5	8	22	100
20-22	N	19	50	29	75	2	78	11	21	121	17	43	64	235	1061
	%	18	47	27	8	2	7	11	20	11	16	4	6	22	100
23+	N	70	19	14	52	5	35	34	79	61	72	16	52	105	459
	%	15	42	32	11	1	8	7	17	13	16	4	11	23	100
$\chi^2 = 14.187$; $p = 0.028^*$						$\chi^2 = 25.899$; $p = 0.045^*$									

3.1.5. Grade Level

Regardless of grade level, the most dominant learning style was assimilating, followed by converging, diverging, and accommodating. The proportional distribution of learning styles was close to each other at all grade levels. Fifth graders were students majoring in history teaching. Only twenty-four fifth graders adopted accommodating learning styles (14%). However, the test results showed no significant difference in the distribution of four learning styles between grade levels [$\chi^2 = 13.890$; $p = 0.308$; $p > 0.05$]. On the other hand, the test results were statistically significant according to nine learning styles [$\chi^2 = 46.823$; $p = 0.044$; $p < 0.05$]. More fifth graders adopted acting learning styles than other grade levels. On the other hand, fewer fifth graders adopted imagining learning styles than other grade levels.

Table 6: The Distribution of Learning Styles by Grade Level (chi-square)

Grade Level	F	Diverging	Assimilating	Converging	Accommodating	Initiating	Experiencing	Imagining	Reflecting	Analyzing	Thinking	Deciding	Acting	Balancing	Total
First	N	75	19	12	37	1	41	41	76	49	71	24	36	87	436
	%	17	45	29	9	3	9	9	17	11	16	6	8	20	100
Second	N	81	20	12	35	9	30	47	81	57	67	13	25	117	446
	%	18	45	29	8	2	7	11	18	13	15	3	7	26	100
Third	N	73	18	11	25	3	30	39	77	46	80	14	22	88	399
	%	18	47	28	6	1	8	10	19	12	20	4	6	22	100

Fourth	N	71	17	11	35	7	32	43	78	44	55	16	36	84	395
	%	18	44	30	9	2	8	11	20	11	14	4	9	21	100
Fifth	N	20	74	55	24	4	10	9	28	31	24	9	23	35	173
	%	12	43	32	14	2	6	5	16	18	14	5	13	20	100
$\chi^2 = 13.890$; $p = 0.308$						$\chi^2 = 46.823$; $p = 0.044$									

3.2. The Effect of Independent Variables on Learning Characteristics (CE, RO, AC, AE, perceiving information AE-RO, and processing information AC-CE)

According to Kolb's Experiential Learning Theory, one perceives information through either concrete experience (CE) or abstract conceptualization (AC) and processes that information through reflective observation (RO) and active experimentation (AE). AE-RO (x-axis) and AC-CE (y-axis) scores were calculated on learning style grid coordinates to identify learning styles. Table 7 shows the results.

Table 7: The Effect of Independent Variables on Learning Characteristics (CE, RO, AC, AE, AE-RO, and AC-CE)

Variable	Sub-variable	N	CE \bar{X}	Sd	RO \bar{X}	sd	AC \bar{X}	Sd	AE \bar{X}	sd	AC-CE \bar{X}	Sd	AE-RO \bar{X}	Sd
Universities	VYYU	236	24.9	4.71	28.6	5.18	33.5	4.80	33.2	5.81	8.6	7.84	4.6	9.30
	DEU	229	25.3	5.03	30.2	5.09	33.8	5.01	30.7	4.94	8.4	8.73	.5	8.74
	DU	236	25.7	4.38	28.7	4.93	33.5	5.11	32.1	4.55	7.8	7.95	3.5	7.91
	GU	235	26.2	5.18	29.6	4.97	33.6	5.38	30.8	4.93	7.5	8.72	1.16	8.13
	MU	116	24.3	4.48	28.0	4.98	35.1	5.36	32.6	5.35	10.8	7.91	4.6	8.44
	ATAU	287	25.5	4.95	29.4	5.48	32.8	5.24	32.3	5.59	7.3	8.21	2.9	9.29
	NEU	133	25.8	5.56	29.5	5.39	33.6	5.43	31.1	5.37	7.8	9.02	1.5	8.72
	OMU	143	25.6	4.94	31.3	5.48	32.3	5.25	30.7	4.78	6.7	8.31	-.5	8.43
	AU	85	25.4	5.41	29.0	5.42	33.7	5.32	32.1	5.18	8.3	8.69	3.1	8.64
	BU	149	24.8	5.19	29.7	5.24	34.2	5.34	31.3	4.82	9.5	8.76	1.6	8.22
one-way ANOVA			$p=0.033$		$p=0.000$		$p=0.001$		$p=0.000$		$p=0.002$		$p=0.000$	
Major	HE	875	25.1	4.87	29.1	5.41	33.9	5.36	31.9	5.43	8.9	8.33	2.8	9.10
	H	974	25.7	5.02	29.7	5.08	33.1	5.05	31.6	5.04	7.4	8.44	1.9	8.43
	<i>t-test</i>		$p=0.011$		$p=0.011$		$p=0.000$		$p=0.187$		$p=0.000$		$p=0.021$	
Gender	M	894	26.0	4.92	29.2	5.35	33.3	5.35	31.5	5.50	7.3	8.56	2.4	9.17
	F	955	24.8	4.93	29.6	5.15	33.7	5.09	31.9	4.95	8.9	8.22	2.2	8.37
	<i>t-test</i>		$p=0.000$		$p=0.06$		$p=0.124$		$p=0.193$		$p=0.000$		$p=0.726$	
Age	17-19	329	25.4	5.40	29.3	5.06	33.5	5.38	31.9	5.15	8.1	9.18	2.6	8.53
	20-22	1061	25.4	5.02	29.7	5.29	33.5	5.21	31.5	5.28	8.1	8.41	1.8	8.77
	23+	459	25.4	4.45	28.8	5.25	33.6	5.13	32.1	5.16	8.2	7.87	3.3	8.83

		<i>one-way ANOVA</i>	<i>p=0.997</i>		<i>p=0.020</i>		<i>p=0.931</i>		<i>p=0.056</i>		<i>p=0.975</i>		<i>p=0.008</i>	
Grade Level	1	436	25.6	5.48	29.3	5.23	33.5	5.25	31.6	5.18	7.9	9.15	2.3	8.79
	2	446	25.2	4.89	29.9	5.08	33.3	5.26	31.8	5.45	8.1	8.47	1.9	8.74
	3	399	25.4	4.53	29.5	5.12	33.8	5.45	31.4	4.90	8.4	8.05	1.9	8.07
	4	395	25.6	5.08	29.3	5.34	33.3	4.79	31.8	5.17	7.7	8.08	2.5	8.96
	5	173	25.1	4.35	28.4	5.66	34.2	5.39	32.4	5.57	9.1	7.93	4.1	9.65
		<i>one-way ANOVA</i>	<i>p=0.530</i>		<i>p=0.031</i>		<i>p=0.225</i>		<i>p=0.254</i>		<i>p=0.366</i>		<i>p=0.062</i>	

3.2.1. University

The ANOVA results revealed a significant difference for each learning characteristic. Participants from the GU had the highest CE score ($\bar{X}=26.16$), while those from the MU had the lowest CE score ($\bar{X}=24.31$) ($F=2.026$ and $p<0.05$). The post-hoc analysis showed that the difference was statistically significant. In other words, participants from the GU had a significantly higher mean CE score than those from the MU. Participants from the OMU ($\bar{X}=31.27$) had a significantly higher mean AC score than those from the MU ($\bar{X}=28.01$) ($F=3.055$ and $p<0.05$). Participants from the OMU ($\bar{X}=31.27$) had a significantly higher mean RO score than those from the MU ($\bar{X}=28.01$) ($F=4.948$ and $p<0.05$). The post-hoc analysis showed that the difference was between participants from the OMU and those from the VYYU, DU, and MU. Participants from the VYYU had the highest mean AE score ($\bar{X}=33.17$), while those from the DEU had the lowest mean AE score ($\bar{X}=30.67$). The significant difference in AE scores was between participants from the VYYU and those from the DEU, GU, and OMU ($F=5.093$ and $p<0.05$). According to the results of the analysis of the mean scores calculated for the learning style grid coordinates (x: AE-RO, y: AC-CE) according to demographic variables (Table 7), there was a significant difference in AE-RO and AC-CE scores [(AE-RO: $F=6.988$ and $p<0.05$), AC-CE: $F=2.864$ and $p<0.05$]. According to the posthoc analysis, there was a significant difference in AE-RO scores between participants from the VYYU and those from the DEU, GU, OMU, and BU; between participants from the DEU and those from the DU and MU; between participants from the GU and those from the MU; between participants from the OMU and those from the DU, MU, and ATAU. There was a significant difference in AC-CE scores between participants from the MU and those from the DU, GU, ATAU, and OMU.

3.2.2. Major

An independent samples t-test was performed to determine the difference in CE, RO, AC, AE, AC-CE, and AE-RO scores between participants majoring in history teaching and those majoring in history (Table 7). Participants majoring in history ($n=974$ and $\bar{X}=25.69$) had a significantly higher mean CE score than those majoring in history teaching ($n=875$ and $\bar{X}=25.10$) ($t_{(1847)}=2.552$ and $p<0.05$). However, participants majoring in history ($\bar{X}=33.13$) had a significantly lower mean AC score than those majoring in history teaching ($\bar{X}=33.99$) ($t_{(1847)}=3.54$ and $p<0.05$). Participants majoring in history ($\bar{X}=29.69$) had a significantly higher mean RO score than those majoring in history teaching ($\bar{X}=29.07$) ($t_{(1847)}=3.54$ and $p<0.05$). However, there was no significant difference in AE scores between participants majoring in history ($\bar{X}=31.55$) and those majoring in history teaching ($\bar{X}=31.88$) ($t_{(1847)}=1.31$ and $p>0.05$). There was a significant difference in AC-CE and AE-RO scores between participants majoring in history and those majoring in history teaching (Table 7).

3.2.3. Gender

There was a significant difference in CE and AC-CE scores between male and female participants. Male participants ($n=894$ ve $\bar{X}=26.03$) had a significantly higher mean CE score than their female counterparts ($n=955$

and $\bar{X}=24.84$) ($t_{(1847)}= 5.16$ and $p<0.05$). However, male participants ($\bar{X}=7.3$) had a significantly lower mean AC-CE score than their female counterparts ($\bar{X}=8.9$) ($t_{(1847)}= 3.99$ and $p< 0.05$).

3.2.4. Age

All participants had similar scores in all learning characteristics but RO and AE_RO scores. There was no significant difference in RO scores between participants 17-19 years of age ($n=329$ and $\bar{X}=26.03$) and those 20-22 ($n=1061$ and $\bar{X}=29.66$). Participants over 23 years of age had an RO score of $\bar{X}=28.84$ ($n=459$), indicating that they made reflective observations less often than the other groups ($F=3.927$ and $p< 0.05$). According to the posthoc results, there was a significant difference in AE-RO scores between participants 20-22 years of age ($\bar{X}=1.81$) and those 23-25 years of age ($\bar{X}=3.30$) ($F=4.827$ and $p< 0.05$).

3.2.5. Grade Level

The ANOVA results showed that grade level affected participants' RO scores ($F=2.660$ and $p<0.05$). According to the posthoc analysis, second graders ($\bar{X}=29.87$) had a significantly higher mean RO score than fifth graders ($\bar{X}=28.38$).

Table 7: Results

	4LS	9LS	CE	RO	AC	AE	AC-CE	AE-RO
University	X	X	X	X	X	X	X	X
Major	X	X	X	X	X		X	X
Gender	X	X	X				X	
Age	X	X		X				X
Grade Level		X		X				

X= Significance

4. Discussion

The results showed that participants adopted all four or nine learning styles developed by Kolb. Almost half of the participants adopted assimilating learning styles, followed by converging, diverging, and accommodating learning styles. Kolb (1984) and Kolb, Boyatzis, and Mainemelis (2014) argue that most people who specialized in history adopt diverging learning styles. On the other hand, Aşkar and Akkoyunlu (1993) found that more than half of students majoring in social sciences had assimilating learning styles. According to Kolb's classification of nine learning styles, about two-thirds of our participants adopted balancing, reflecting, thinking, or analyzing learning styles. According to Kolb's Experiential Learning Theory, those learning styles are combinations of abstract conceptualization and reflective observation learning styles of the learning cycle. Therefore, people who adopt these learning styles learn by thinking and observing. People with assimilating learning styles can organize extensive and comprehensive information into a logical whole, make plans, and identify problems. However, they often find it challenging to adopt a systematic approach in practice (Kolb, 1981). Less than a quarter of our participants adopted balancing learning styles characterized by adaptability. People with balancing learning styles tend to be more satisfied in learning environments where they can use all four learning modes. They learn from lessons, discussion groups, brainstorming sessions, lab activities, and hands-on methods. Moreover, they can learn from teachers with different teaching approaches because they can adapt to different learning environments.

The results showed that what learning styles participants adopted depended on which university they went to. Research also shows that geography (Healey, Kneale, & Bradbeer, 2005; Özdemir, 2015), chemistry (Çelikler, 2020), and biology (Güneş, 2018) students from different universities have different learning styles.

There was a significant difference in all “learning mode” scores but AE between participants majoring in history and those majoring in history teaching. However, Güneş (2018) reported that major did not affect undergraduates’ learning styles. On the other hand, Özdemir (2014) and Çelikler (2020) determined that undergraduates from different departments had different learning styles. Gürsoy (2008) also focused on the effect of majors (classroom teaching, science teaching, and Turkish teaching departments) on preservice teachers’ learning styles. He found that students majoring in different departments had different learning styles.

There was a significant difference in CE and AC-CE scores between male and female participants. Çavaş (2010) also detected a significant difference in AE and AE-RO scores between male and female preservice science, classroom, and math teachers. On the other hand, Karademir and Tezel (2010) documented a significant difference in RO scores between male and female preservice classroom teachers. Kolb (2005a) reports significant differences in AC-CE and AE-RO scores between male and female students. However, he states that we should not make gross generalizations, such as “women learn concretely, while men learn abstractly.” In line with this, Cevher and Yıldırım (2020) conducted a meta-analysis of 341 academic articles on learning styles published between 2000 and 2016 in Türkiye. They documented those 54 articles investigated the relationship between gender and learning styles. More than half of those 54 articles reported no relationship between gender and learning styles (61%; $n=33$). However, some researchers argue that men and women have different learning styles (Çaycı, & Ünal, 2007; Demirkol, 2009; Karademir, & Tezel, 2010; Çiğdem, & Memiş, 2011; Zengin, & Alşahan, 2012; Yeşilyurt, 2014), while others report no difference in learning styles between men and women (Güven, 2003; Demir, 2006; Mutlu, 2008; Durdukoca, & Arıbaş, 2010; Koçakoğlu, 2010; Deniz, 2011; Özdemir, & Kesten, 2012; Güneş, 2018; Çelikler, 2020).

Age affected our participants’ learning styles. For example, participants over 23 years of age had a significantly higher mean AE score than other age groups, indicating that they used active experimentation when processing information more often than other age groups. Grade level led to a significant difference in nine learning styles and RO scores between participants. Fifth graders had the lowest mean RO score and the highest mean AE score. This result is consistent with longitudinal studies suggesting that students move from reflective to active learning styles throughout their undergraduate years (Kolb, 2005; Kolb, & Kolb, 2013). Mentkowski and Strait (1983) conducted a longitudinal study in a sample of university students majoring in history and philosophy to investigate the relationship between cognitive development levels and learning styles. They found that students had higher cognitive development levels and adopted better learning styles in the last year than in the first year of college. They preferred CE learning styles in the first year, while they adopted AC and converging learning styles in the last year of college. In other words, they moved from CE and RO (diverging learning style) to AC and AE (converging learning style). Özdemir, Kesten, and Işkın (2017) conducted a longitudinal study to determine preservice social studies teachers’ learning styles. They reported that students moved from assimilating to accommodating learning styles but that there was no significant difference in “learning modes” and CE-AC and RO-AE scores between pretest and posttest scores. Özdemir and Kesten (2012) investigated preservice social studies teachers’ learning styles and reported two findings. First, students of all grade levels (from the first to the fourth year) adopted the four learning styles. Second, assimilating learning styles were the most dominant learning styles among almost half of first-year students, while converging learning styles were the most dominant learning styles among almost half of fourth-year students. Özdemir (2015) documented that grade level and age affected preservice geography teachers’ learning styles. Güneş (2018) reported that preservice biology teachers of different grade levels had different learning styles. Çelikler (2020) found that age significantly affected chemistry students’ learning styles. On the other hand, some researchers argue that these variables do not affect Turkish undergraduates’ learning styles (Kaf Hasırcı, 2006; Arsal, & Özen, 2007; Ergür, 2010; Can, 2011; Başbüyük, Sülün, Bahar, & Kışoğlu, 2011; Kiriş Avaroğlu, & Şaman, 2020).

Our results showed that participants majoring in history adopted different learning styles. Students who know the advantages and disadvantages of their learning styles can develop learning strategies in line with the learning needs of their majors. Historians need to use different learning modes in the dimensions of perceiving and processing information to analyze, synthesize, and evaluate historical developments. They should use different learning modes, from abstract conceptualization to concrete experience and from reflective observation to active experimentation, to transform abstract historical events into concrete representations or to relate new knowledge to the present. Academics should recognize that every student has a different learning style. In line with this, they should ensure that their lesson plans integrate different strategies to provide students with a more democratic learning environment.

In Türkiye, most students who graduate from history and history teaching departments work as teachers. Therefore, they should deliver their lectures according to their students' learning styles to turn them into individuals who can think and put their ideas into practice to contribute to individual and social development in the long term.

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Smartphone Addiction and Social Appearance Anxiety as Predictors of Junior High Students' Need to Make a Good Impression*

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Abstract

The aim of the present study is to investigate the relative contribution of smartphone addiction and social appearance anxiety as well as age and gender in predicting early adolescents' need to make a good impression. 382 students (50% girls) from two junior high schools answered the Smartphone Addiction Scale-Short Version, the Social Appearance Anxiety Scale and the Need for Social Approval Scale. As a result of the regression analysis, age, gender, smartphone addiction and social appearance anxiety contributed significantly to explain 38% of the variance in adolescents' need to make a good impression. Social appearance anxiety was found to be the strongest predictor of the need to make a positive impression in early adolescents. A moderate positive relationship was found between smartphone addiction and the need to leave a positive impression. While age was negatively related to the need to make a good impression, girls were found to have a higher need to make a good impression than boys. Examining the model with regression diagnostics, it was concluded that it is a reliable model that can be generalized to the population.

Keywords: Smartphone Addiction, Social Appearance Anxiety, Need for Social Approval, Need to Make a Good Impression, Early Adolescence

1. Introduction

Baumeister and Leary (1995) defined the need for belonging, which is the basic interpersonal motive caused a great deal of human behavior, emotion, and thought as the avoidance of rejection by others and need for temporally stable, affectively pleasant interactions with others. It is thought that this motive provides the survival and reproductive benefits in the evolution of the human species by creating social relations and groups. Baumeister and Leary stated that people's need to belong must be met for their psychological and physical well-being, otherwise their emotional patterns and cognitive processes would be negatively affected, and in the case of a

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possible long-term deprivation, a great deal of negative effects are seen on the well-being, health and harmony of the person.

Baumeister and Leary (1995) claimed that people want to belong to a group to meet their needs such as power, achievement, intimacy, approval, or they are motivated by these needs to belong to a group. Approval is a prerequisite for a person to establish and maintain social relationships, so that the person can meet the need for belongingness through the relationships he/she establishes. Therefore, approval is a key concept for the need for belongingness. Leary and Kowalski (1995) stated that while meeting the need for belongingness, people are mindful of leaving a positive impression on the other. It is also expressed as impression management, which is being mindful to how others see the individual and how the individual wants to show him/herself to others (Leary & Kowalski, 1995; Schlenker & Pontari, 2000). Schlenker and Pontari (2000), Hogan (1982) suggested that in real or imagined social interactions, impression management can be conscious or unconscious attempt to control the image that is perceived by others.

Investigational studies in the literature reveal that social anxiety plays an important role in impression management (Di Blasi et al, 2015; Schlenker & Leary, 1982; Snyder & Monson, 1975). Although Leary, Kowalski and Campbell (1988) stated that people occasionally experienced anxiety in their social interactions, they emphasized that there were individual differences in the frequency and intensity of experiencing social anxiety. Many studies have been reported that individuals with high social anxiety tend to think that they have more anxiety about making a positive impression than others and that they leave less positive impression on others after the interaction (Greenberg, Pyszczynski, & Stine, 1985; Leary et al., 1988).

Brooks-Gunn and Lewis (1984) suggested that self-awareness begins to emerge in children around the age of 18 months. In the preschool period, a child realizes the theory of mind, in other words, that the wishes, thoughts and feelings of others may be different from himself/herself and may change over time (Wellman, 2018). However, the capacity to make temporal and causal connections develops during late childhood and becomes more holistic and complex in adolescence. Thus, adolescents become proficient in complex temporal and perspective-based reasoning. They understand that experiences are not independent from each other, but are interconnected and that these events are effective in the transformation of themselves into who they are currently (Habermas, 2011). In addition to the cognitive skills acquired in this period, rapid and significant bodily changes become important for the adolescent to know him/herself and to make sense of his/her life. Rapid and significant changes in the body make the adolescent worry about his/her physical appearance, and excessive interest may cause him/her to fear situations where his/her physical appearance (body and face shape, weight, height) may be negatively evaluated by others after a while (Hart et al., 1989, 2008).

According to the self-presentation theory, self-presentation is defined as the behavior of conveying some information or images about oneself to others. Baumeister and Hutton (1987) stated that there were situational factors as well as stable personality-related factors underlying self-presentation behavior. The presence of evaluative others and the presence of others who may have knowledge about the person's behavior are effective in motivating the person to self-presentation behavior. Two types of self-presentation motives have been identified: 1. One's self-presentation in accordance with the expectations and preferences of the audience, 2. One's self-presentation in accordance with one's own ideal self (pp.71-72). Hogan (1982) stated that self-presentational motivations derive from two basic needs as status and power. Eder (1985) and Harter (1990) have shown that students' concerns about popularity increase after they enter secondary school.

Social appearance anxiety seems to be related to the need to make a positive impression on others and is probably reinforced by the perception of one's own inadequacies to achieve this goal (Boursier & Gioia, 2020). Thus, the adolescent may become addicted to drugs such as tobacco, alcohol and illegal and prescription drugs to leave a positive impression on others. Such addictions can increase their self-confidence by helping the adolescent to look cool and at the same time feel more comfortable during social relationships after using these drugs. Thus, adolescent can use these drugs to calm her/his social anxiety (O'Callaghan & Doyle, 2001). In addition to drug addiction, behavioral addictions are also used to reduce social anxiety and create a positive impression. Internet addiction is one of the most researched behavioral addictions in the last two decades (Pan, Chiu, & Lin, 2020).

Since the beginning of the second millennium, with the rapid spread of the internet, virtual contexts as well as physical contexts have increasingly become the channels that people use to socialize. Social media is defined as a computer-based technology that facilitates the exchange of information and ideas, thoughts, and information among people through virtual networks and communities (Dollahide, 2021, p.1). Social media creates an interactive environment by enabling people to share their thoughts, interests and activities through online chats and to receive and give feedback. After a while, these behaviors may become a habit or addiction. From this viewpoint, social media addiction can be defined as the compulsive overuse of a person by preferring surfing the social media to other activities (Zivnuska et al., 2019).

The mobile phones could do a few things which including calls and text messages in the first days of their release, shortly after internet technology integrated into them. Smartphones, which have progressed by incorporating new functions in the last two decades, have become a critical part of individuals' daily lives as they are easy to carry and multifunctional (Tocci, 2019). According to the reports of the Turkish Statistical Institute (TURKSTAT, 2013, 2021) on adolescents for aged 11–15 years, the proportion of males who own a smartphone increased 26% in 2013 to 57.7% in 2021. The proportion of females who own a smartphone increased from 21.9% in 2013 to 53.1% in 2021. The proportion of children who use smartphones regularly and check their smartphones every half hour is 43.5%. TURKSTAT (2021) reported that 81% of adolescents use social media almost every day and spend close to three hours on average. These findings show that half of the them have a smartphone, nearly half of the them check the phone every half hour, and most of the them use social media for an average of three hours a day during the day. Many studies indicate that the use of phone applications (such as instagram, facebook, whatsapp) is a key factor in the development of smartphone addiction in adolescents (Liu et al., 2016; Yang et al., 2022).

Boursier, Gioia and Griffiths (2020) revealed that problematic social media use is associated with body image. Considering that smartphones are the most frequently used tools for regulating and maintaining people's social relationships in a virtual environment, we can expand our understanding of the temporal impacts on adolescence by examining the effects of addiction to these tools and social appearance anxiety on early adolescents' self-presentation. The present study explores the predictive effects of social appearance anxiety and smartphone addiction on the need for social approval and its subscales (sensitivity to others' judgments, social withdrawal, and leaving a good impression) in early adolescents.

2. Methodology

2.1. Participants

The sample of the study consisted of 382 students (50% girls, 42% grade 7, $\bar{x}_{age} = 13.39$, $sd = .49$) who stated that they had a smartphone among 476 students selected by convenience sampling among the grades 7 and 8 students in two junior high schools in Konya, Turkey in the 2021–2022 academic year.

2.2. Measures

In this study, the Smartphone Addiction Scale-Short Version, Social Appearance Anxiety Scale and Need for Social Approval Scale were used as data collection tools.

2.2.1. Smartphone Addiction Scale-Short Version (SAS-SV): Smartphone Addiction Scale, a 33-item self-report measure, developed by Kwon and colleagues (2013a), was revised by Kwon and colleagues (2013b) and was abbreviated as 10 items. The measure utilizes a six-point Likert scale response format ranging from “1” (strongly disagree) to “6” (strongly agree). Şata and Karip (2017) translated and validated SAS-SV in Turkish. The Cronbach alpha internal consistency coefficient of the scale is .90. The cut-off score of the scale was 29.5 (Şata & Karip, 2017).

2.2.2. Social Appearance Anxiety Scale (SAAS): The original scale was developed by Hart et al. (2008) to measure the anxiety of being negatively evaluated by others because of one's overall appearance with 16 items. The measure utilizes a five-point Likert scale response format ranging from “1” (not at all) to “5” (extremely). Doğan

(2009, 2011) translated and validated in Turkish with his study on university students and adolescents. The Cronbach alpha internal consistency coefficient of the scale was found to be .91 and the test-retest reliability coefficient to be .80 (Doğan, 2011).

2.2.3. Need for Social Approval Scale (NSAS): NSAS was developed by Karaşar and Öğülmüş (2016) to measure the need for the approval of others with 25 items. The measure utilizes a five-point Likert scale response format ranging from “1” (Strongly disagree) to “5” (Strongly agree). The 25 items are arranged into three subscales: Sensitivity to Others’ Judgments, Social Withdrawal, and Leaving a Good Impression. The Cronbach alpha internal consistency coefficient of the scale for which study was conducted on adolescents was found to be .91, and the test-retest reliability coefficient was found to be .90. The internal consistency coefficients of the three subscales were: .81 for Sensitivity to Others’ Judgments, .78 for Social Withdrawal, and .81 for Leaving a Good Impression (Karaşar & Öğülmüş, 2020).

2.3. Research Design

The researchers used a cross-sectional survey design to examine the predictive relationships between gender, social appearance anxiety, internet addiction, and the need for social approval in early adolescents.

2.4. Procedures

The present study was conducted in accordance with the Declaration of Helsinki. During the data collection process, in classrooms the third author had read the Informed Consent Form, which included simple explanations about the purpose of the research, data analysis method, confidentiality and volunteering statements to participate in this study, and she collected data on students who agreed to participate. Data were analyzed with R software (version 4.1.1, R Core Team, 2021).

3. Results

Internal consistency of the scales, descriptive statistics and correlations between the SAS-SV, SAAS, NSAS are presented in Table 1.

Table 1: Correlation matrix and descriptive statistics for study variables

	1	2	3	4	5	6	7	8
1 Gender		-.10	.09	.11	.12	.03	.07	.19
2 Age	.04		.03	-.05	-.09	-.06	-.04	-.12
3 Smartphone addiction	.08	.60		.31	.22	.02	.24	.30
4 Social appearance anxiety	.03	.32	<.01		.55	.30	.52	.58
5 Need for social approval	.02	.09	<.01	<.01		.80	.84	.87
6 Sensitivity to others’ judgments	.52	.26		<.01	<.01		.48	.52
7 Social withdrawal	.17	.47	<.01		<.01	<.01		.67
8 Leaving a good impression	.00	.02	<.01	<.01	<.001	<.01	<.01	
\bar{x}	-	13.39	28.74	41.07	80.66	32.08	23.05	25.54
<i>sd</i>	-	0.49	10.38	15.87	16.67	6.84	6.36	6.68

α	-	-	.84	.93	.88	.79	.73	.79
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Note. Values in the top right are correlation coefficients, bottom left are p-values.

While gender (0=Male, 1=Female) was not correlated with smartphone addiction, it was positively correlated with social appearance anxiety and need for social approval. Sensitivity to others' judgments and social withdrawal were not correlated with gender, whereas leaving a good impression was weakly positively correlated with gender. While age was not correlated with variables other than leaving a good impression, it was weakly negatively correlated with leaving a good impression.

Smartphone addiction was weakly positively correlated with the need for social approval, and moderately positively correlated with social appearance anxiety. While smartphone addiction was not correlated with sensitivity to others' judgments, it was weakly and positively correlated with social withdrawal and moderately positively correlated with leaving a good impression. The need for social approval was highly positively correlated with social appearance anxiety.

The mean of the scores for the smartphone addiction was 28.74, which is below the cut-off score of 29.5 derived by Şata and Karip (2017). The mean of the need for social approval was 80.66, which is above high school students' mean of 71.44 derived by Karaşar and Öğülmüş (2020). The mean of the social appearance anxiety was 41.07, which is above high school students' mean of 36.61 derived by Akarsu and Demirpençe (2022).

In the first regression model, age, gender, smartphone addiction and social appearance anxiety were included as predictive variables and analyzed. The Rainbow test (Krämer & Sonnberger, 1986; Utts, 1982) was used to examine whether the model met the linearity assumption. Upon understanding that the model was not linear ($F [238,235] = 1.56, p < .001$), three different models were established and tested for their linearity, namely, sensitivity to others' judgments, social withdrawal and leaving a good impression, which are subscales of the need for social approval scale. Only the "need to make a good impression" model met the linearity assumption ($F [238,232] = 1.01, p > .05$) as well as the other assumptions.

Table 2: Regression Coefficients of Age, Gender, Smartphone Addiction and Social Appearance Anxiety on Leaving a Good Impression

	ΔR^2	B	SE	β	t	p	95%CI
	.38						
(Intercept)		29.93	7.59		3.94	<.001	[15, 44.86]
Age		-1.23	0.56	-.09	-2.20	<.05	[-2.34,-0.13]
Gender ^a		1.46	0.55	.11	2.64	<.01	[0.37, 2.54]
Smartphone Addiction		0.08	0.03	.13	3.03	<.01	[0.03, 0.14]
Social Appearance Anxiety		0.23	0.02	.52	12.12	<.001	[0.18, 0.26]

Note. N= 382. Adjusted $R^2 = .37$. CI=Confidence Interval.

^a 0=Male, 1=Female.

According to the multiple regression analysis results given in Table 2, age, gender, smartphone addiction and social appearance anxiety explain 38% of the variance in the need to make a good impression ($F [4, 377] = 56.44, p < .001$). Beta values indicate that smartphone addiction and social appearance anxiety are positively related to the need to make a good impression. Smartphone addiction increases by one standard deviation, the need to make a good impression increases by 0.13 standard deviations. Social appearance anxiety increases by one standard deviation, the need to make a good impression increases by 0.52 standard deviations. Age increases by one standard deviation, the need to make a good impression decreases by 0.09 standard deviations. Older students have less need to make a good impression than younger ones ($\beta = -0.09; t = -2.2, p < .05$). Girls have need to make a positive impression higher than boys ($\beta = 0.11, t = 2.64, p < .05$).

The model was examined with diagnostic tests to determine whether it was generalizable to the population. It was confirmed that 95% of the standardized errors of the cases were between +2 and -2. Since the values of Cook's distance were all under 1, none of the cases was having undue influence on the model (0–0.03). The

homokedasticity assumption was confirmed by the Breusch-Pagan test ($LM [4] = 3.57, p > .05$; Breusch & Pagan, 1979, also see Figure 1). The variance inflation factor values ranged from 1.15 to 1.02, so there was no multicollinearity problem. The assumption of independent errors was validated using the Durbin-Watson test ($DW = 1.82, p > .05$). The Q-Q plot and the scatter plot of the fitted values against studentized residuals were examined to see if the assumption of random errors has been met. Except for a few extreme values deviating from the line in the Q-Q plot, we could say that residuals distributed normally. In the scatter plot, the residuals did not take a certain shape around the estimated regression line and are randomly distributed (see Figure 1, Figure 2).

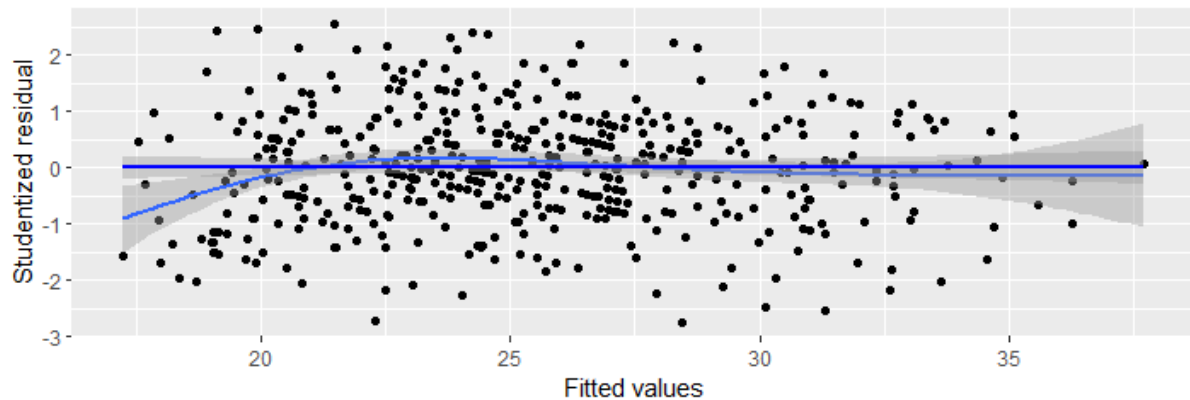


Figure 1: Scatterplot of residuals against fitted values for the need to make a good impression model

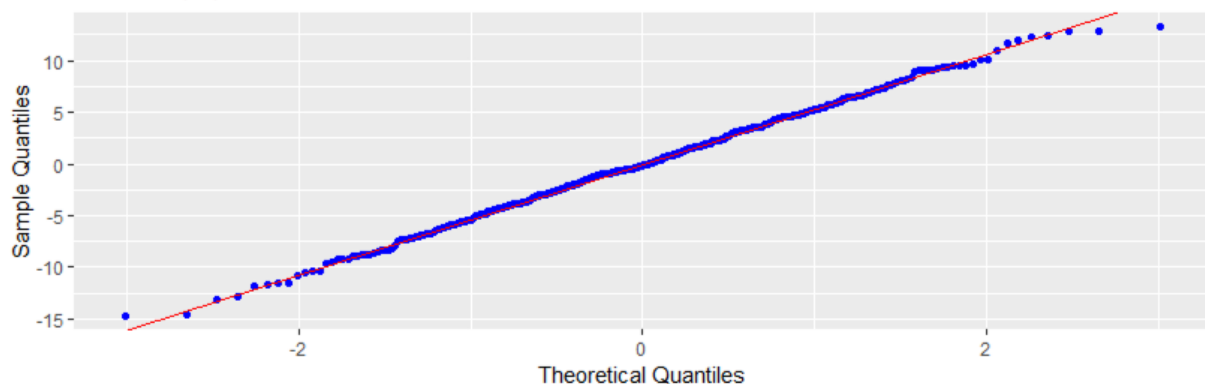


Figure 2: Q-Q plot for the need to make a good impression model

4. Discussion and Conclusion

We could summarize by saying that junior high students' need to make a good impression regression model is a reliable model that can be generalized to the population. However, the fact that the leaving a good impression subscale consists of defensive and avoidant items and does not include active approval-seeking behaviors limit the usability of the model (see Martin & Greenstein, 1983, p.652).

The need for social approval and social appearance anxiety of the junior high school students in the study were higher than the studies conducted on high school students using the same scales (see Akarsu & Demirpençe, 2022; Karaşar & Öğülmüş, 2020). In the regression model, the need to make a good impression decreases as the age increases. Eder and Harter found that students' concerns about popularity increase after they enter secondary school (Eder, 1985; Harter, 1990). According to Berndt (2002), belonging to a popular group becomes very important, especially in early adolescence. Roscoe, Diana and Brooks (1987), in their study on early (6th grades), middle (11th grades), and late (college students) adolescents' partner selection, found that while early and middle adolescents choose romantic partners to meet their social status needs and gain the approval of others, late adolescents choose romantic partners considering reciprocity in relationships and potential partners' future plans. Self-construction motives (to match one's self-presentation to one's own ideal self) seem to replace audience-pleasing motives with age (Baumeister & Hutton, 1987, p.70).

It has been found that the most important predictor of the need to make a good impression is social appearance anxiety. Social appearance anxiety of individuals is directly related to their physical appearance (Cash & Fleming, 2002), as well as their own beliefs and judgments of others (Leary & Kowalski, 1995). According to Andreassen and colleagues (2017), making a good impression includes the emotions experienced in interpersonal relationships, a person's fear of being socially excluded may result in spending his/her time on social media frequently. In the present study, smartphone addiction in early adolescents contributed significantly to explaining the need to make a good impression. In parallel with this finding, several studies showed that there was a strong positive relationship between self-presentation or body image control and frequency of social media use (Boursier & Manna, 2019; Gioia et al., 2020). Doğan and Çolak (2016) draw attention to the fact that adolescents with high social appearance anxiety can express themselves more easily by choosing social media rather than physical-social environments (also see Ayar et al., 2018; Baltacı et al., 2021; Brown & Tiggemann, 2016; Holland & Tiggemann, 2016).

The model shows that girls have a higher need to make a good impression than boys (Chae, 2017; Nelson, 2013; Senft & Baym, 2015; Warfield, 2014). Eder (1985) found that girls in early adolescence have a greater desire to be loved than they want to be academically successful. Many studies in the literature point out that social appearance anxiety is experienced more frequently by women (Burkley et al., 2014; Dakanalis et al., 2016; Zimmer-Gembeck et al., 2018). Considering of gender stereotypes, we would say that the role of being relational and being dependent on important others attributed to women can explain the need to make a good impression for girls (Haines et al., 2016).

Social media addiction is more common in young people (Andreassen, 2015; Andreassen et al., 2017; Traş & Öztemel, 2019). According to Griffiths (2010), the younger “digital native” generation growing up with information and communication technologies uses social media to seek feedback on their actions and online personas as a way of developing and maintaining relationships as well as developing and shaping their social identities. Rudd and Lennon (2000) draw attention to the fact that adolescents always face same typical identity crises, but that body image is increasingly at the center of this crisis. School counselors' awareness of the relationship between adolescents' social media use and body image will contribute to provide better counseling services to early and middle adolescents. Conducting studies on the digital self-images produced by adolescents in social media will expand our understanding of the nature of the phenomenon. Finally, adolescents can be encouraged to use social media more consciously by providing training on real body image, culturally and chronologically promoted body standards at school (Gioia et al., 2020).

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Integrated Mathematics and Science Instruction on Motion Problems in Grade 9 Classes*

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Abstract

The integration of mathematics and science in teaching facilitates student learning, engagement, motivation, problem-solving, critical thinking, and real-life application. Although curriculum integration is theoretically desirable for many educators, what to integrate and how to integrate are often the big questions facing teachers working within education systems premised on a culture of segregated subject delivery. This quasi-experimental study reports on a 2-week inquiry of the implementation of an integrated unit of learning on motion problems, within upper secondary education in Turkey. In order to reveal the effect of the instruction on students with different mathematics achievements, the study was conducted with 131 students in two different schools. In the design of the integrated unit, continuum model of learning and four-stages of learning model were employed. The study employed a quantitative approach and examined the key aspects of the practice of the integration of mathematics and science teaching. In light of the data obtained, it was concluded that teaching the subject Motion Problems through an integrated design had a positive effect on students' learning for the experimental groups in each school.

Keywords: Curriculum and Instruction, Integrated Teaching, Motion Problems, Upper Secondary Education, Mathematics Education, Science Education

1. Introduction

Some 65 years ago, Smith (1955) published an article in *Mathematics Teacher* in which he stated,

The elimination of mathematics in science courses and the weakened position of mathematics in the curriculum are often justified on the ground that a numerical approach is too abstract, too 'difficult' for our new high school population. We believe that the difficulty in both can be alleviated by encouraging a constant interplay between the concrete applications in physics and mathematical reasoning.

* This study emerged as a result of the reanalysis of the data in the thesis completed in 2018 by the first author under the supervision of the second author, in line with the purpose of the research. Part or all of the research has never been published anywhere before. In Turkey, as with all dissertations made in the field of education before February 2019, this thesis received approval from the Kocaeli Governorate and from the provincial directorate of national education.

Mathematics-physics, a relatively unexplored area, may offer an opportunity for both algebra and physics to regain their stature in the modern curriculum. (p. 537)

Now, 65 years on, one might consider, through the integration of mathematics and science, that teachers have made progress in helping students to not only see the important connections between these two disciplines, but also to understand how one discipline can support learning in the other. It is true that integrating elements of mathematics and school science as a means of strengthening students' understanding of many connections that link science and mathematics has long been accepted amongst educationalists (Treacy & O'Donoghue, 2012). Furthermore, the natural overlaps between school science and mathematics, as Smith (1955) mentioned, have led some educators to suggest that these two subjects should be integrated to the extent *that it becomes indistinguishable as to whether it is mathematics or science* (Berlin & White, 1992, p. 341). However, the literature indicates that there are challenges to fostering such strong interdisciplinary connections, such as time, resources, a culture of segregated subject delivery, lack of teacher education/professional development, and pressure on teachers to prepare students for external discipline-based examinations (Berlin & White, 2012; Czerniak, 2007; Frykholm & Glasson, 2005; Harris et al., 2009; Pang & Good, 2000). It has also been suggested that *what to integrate* and *how to integrate* are the big questions facing teachers (Authors, 2019). Therefore, there is a need for new research to propose an instructional design which contributes to the relevant literature in terms of which topics should be integrated, and how to plan such a course. Accordingly, a central aspect of the current research was the development of an integrated unit of learning on the topic *Motion Problems* in school mathematics with the topic *Motion* in school physics in the Turkish upper secondary education system, which is premised on a culture of segregated subject delivery.

Research on integrated education in Turkey are often limited to theoretical studies or studies reflecting the opinions of teachers regarding integrated courses (Turna & Bolat, 2015). Therefore, the purpose of the current study is to propose an instructional design for a mathematics lesson undertaken in the Turkish upper secondary education context, with a focus on classroom implementation within the "normal" school context, e.g., *prescribed central syllabi, school resources, timetabling*, etc. The study aims to explore if the ninth-grade students can learn the subject of *Motion problems* in their Mathematics course better by relating it to the subject of *motion* in their Physics course. Therefore, the current study aims to answer the following research question:

- What is the effect of a course prepared with an integrated teaching approach for the ninth-grade mathematics lesson on *motion problems* on the students' performance?

The findings of this research are intended to set an example for researchers and educators in creating their own integrative course designs. Also, the current study can be viewed as an account of the key aspects to be taken into consideration for planning similar types of instruction in the future.

1.1. Integrating mathematics and science teaching

Many of the rationales for integrating school subjects are based on the premise that within today's complex, challenging, and globalized world, citizens need to draw upon multidisciplinary knowledge in order to understand and address the multifaceted issues they face (Maass & Engeln, 2019; Ríordáin et al., 2016). Research has demonstrated that curriculum integration provides endless opportunities for more relevant, less fragmented, and more stimulating experiences for learners (Furner & Kumar, 2007). It also helps students form a deeper understanding, more readily see the *bigger picture*, recognize the relevance to real life, and to make connections among central concepts (Bosse et al., 2010). School curricula, however, usually compartmentalize such knowledge into isolated disciplines (Breiner et al., 2012; Rennie et al., 2012), and implementing an integrated approach within an existing education system that has a very established, segregated, and discipline-based structure can necessitate profound restructuring of both curricula and lessons/content (Nadelson & Seifert, 2017).

Integrating elements of Mathematics and Science courses has long been an issue of discussion amongst education groups such as the National Council of Teachers of Mathematics (NCTM), the National Research Council (NRC), the Curriculum Corporation (Australia), and the School Science and Mathematics Association (SSMA) (Treacy & O'Donoghue, 2012), and is a practice that has already been endorsed by a number of academicians. In their

historical analysis of mathematics and science integration, Berlin and Lee (2005) recognized the uniqueness of each discipline and concluded that a symbiotic relationship exists between science and mathematics. Science and mathematics are two closely related systems of knowledge, both are linked to the physical world, include shared concepts, and both require knowledge and skills to facilitate relating and therefore learning (Bower & Ellerton, 2004). Mathematics can enable students to achieve a deeper understanding of science concepts by providing ways to quantify, whilst science can provide students with concrete examples of abstract mathematical ideas (Basista & Mathews, 2002; Osborne, 2014; Park-Rogers et al., 2007). In other words, science provides mathematics with interesting problems to investigate, and mathematics provides science with powerful tools to use in the analysis of data (Rutherford & Ahlgren, 1990).

With their focus on instructional practices in integrated mathematics and science education, constructivist theories suggest a major shift from learning science and mathematics as an accumulation of rote facts and procedures to learning science and mathematics related to authentic contexts (Thibaut et al., 2018). This category of learning theories states that knowledge cannot be transmitted, but rather is actively constructed by students based on their existing ideas and their experiences while for behaviorist theories, the underlying theory for segregated curricula, learning is considered an individual process (Ertmer & Newby, 2013). Frykholm and Glasson (2005) claimed that when mathematics and science learning is segregated, the context of the investigated phenomenon may be lost, and students are therefore less able to resolve real-world problems. The integration of mathematics and science, on the other hand, provides the opportunity for students to apply the discipline to real situations; as situations that are relevant to the students' world, and which are presented according to the students' own perspective (Davison et al., 1995). As such, it can help students to build upon their problem-solving and critical thinking skills, to help make the curriculum more relevant to them, and to help them appreciate how different subjects can be applied together in order to solve an authentic problem (Czerniak, 2007; Pang & Good, 2000). The relevant literature also indicates that mathematics and science integration can positively affect student achievement (Gentry, 2016; Riordáin et al., 2016), and that it is critical for the motivation and engagement of students in meaningful learning (Furner & Kumar, 2007; Wilhelm & Walters, 2006).

However, previous studies have identified a set of interrelated barriers to integration, which are reported as *perceived barriers* by Czerniak and Johnson (2014, p. 403), including school-based structural factors such as time, resources, a culture of segregated subject delivery, lack of time to plan with other teachers, pressure on teachers to prepare students for external discipline-based examinations, and poor teacher content knowledge and pedagogical content knowledge (Berlin & White, 2012; Czerniak, 2007; Frykholm & Glasson, 2005; Furner & Kumar, 2007; Harris et al., 2009; Margot & Kettler, 2019; Nadelson & Seifert, 2017; Nagle, 2013; Offer & Vásquez-Mireles, 2009; Pang & Good, 2000; Riordáin et al., 2016; Stinson et al., 2009; Tchoshanov, 2011; Wong & Dillon, 2019). Most teachers are subject specialists and therefore do not possess the requisite knowledge or confidence required to integrate the language, methods, concepts, or content of another discipline (Basista & Mathews, 2002; Weinberg & Sample McMeeking, 2017). In addition, curriculum writers and teachers are faced with the challenge of finding and/or developing integrated units appropriate to the curriculum (Lonning & De Franco, 1997). To complicate matters, since many educators do not understand curriculum integration that well, no clear formula for such an implementation exists, and the organizational structure of the departments presents a significant obstacle to collaborating with others (Drake & Burns, 2004).

As the reviews of the relevant literature demonstrate, the implementation of integrated mathematics and science lessons is likely to be influenced by factors such as teachers' level and the school environment. The current study seeks to make use of *integrating* the study of *motion* in mathematics and physics for the students, whilst also looking to frame the study in terms of measurable student outcomes. Thus, the current study has a number of specific focal areas in order to identify the aspects of practice, what subjects should be integrated and how they should be integrated, and to facilitate the integration of mathematics teaching with science at the upper secondary level. The researchers in the current study aimed to examine this phenomenon within Turkey's centralized, mandated syllabi, with one individual teacher implementing integration on their own within the normal working confines of a school. Since the current study explores enacting a response to links identified between these two areas of the curriculum, going beyond the realm of theoretical study or reflecting teachers' opinions, the current study's findings aim to contribute to the literature regarding the integration of mathematics and science.

1.2. Context of The Study

1.2.1. Upper Secondary Education in Turkey

The Turkish educational system operates on a centralized model and is based on a significantly prescriptive curriculum. The Turkish curriculum is centrally devised by the Turkish Board of Education and is administered by the Turkish Ministry of National Education. A centralized national Upper Secondary Transition Examination (LGS) is applied at the end of the lower secondary education (i.e., at the end of Grade 8) for entry to high school (i.e., from Grade 9 to Grade 12). Biology, Physics, and Chemistry lessons taught under a combined Science discipline in secondary school are compartmentalized as of the ninth grade. Both mathematics and science are compulsory subjects for all students throughout upper secondary education (i.e., high school). Apart from the curriculum, other resources that teachers employ in the teaching of their courses include course textbooks as determined by a committee appointed to the Turkish Board of Education, and are compulsory in all public schools. Traditionally, the departments of Mathematics and Science in Turkish schools operate in isolation, with little or no cooperative planning taking place in terms of overlapping topics between the two disciplines. In addition, although the concept of integration was included both qualitatively and quantitatively in the previous Upper Secondary Education Mathematics Curriculum to a significant degree, the current curriculum, which was introduced in Turkey in 2017, provides for a lesser degree of cross-disciplinary integration (Milli Eğitim Bakanlığı [Turkish Ministry of National Education], 2017b). In other words, whilst teachers may be considered to possess the required competencies to integrate certain elements of mathematics and science courses, the current curriculum largely does not support its enactment. Also, the related literature from the Turkish context has demonstrated that whilst many educators may desire the integration of some topics in mathematics and physics, there are certain challenges, as previously mentioned in the Introduction section of the current study, that may prevent its successful implementation (Dervişoğlu & Soran, 2003; Authors, 2019; Özhamamcı, 2013).

1.2.2. Participating teachers

For the design phase of the integrated course, the researchers worked with one physics and two mathematics teachers on the design of the course, the arrangement of the worksheets, and for the achievement test. During the implementation phase, two mathematics teachers involved in the design phase of the course applied the design within their classes. The physics teacher who worked on the design phase did not participate in the implementation phase. Notably, within the active implementation of the classroom element of the current study, there was no flexibility given in either the timetable or the class schedule.

1.2.3. Ninth-grade Mathematics and Physics curricula/ textbooks

Before designing the integrated unit of learning, the Turkish ninth-grade Mathematics and Physics curricula (Milli Eğitim Bakanlığı [Turkish Ministry of National Education], 2017a) were examined, as well as the relevant textbooks specified in the curricula for the topic of *motion*. As a result, the following conclusions were reached:

- In the ninth-grade Physics curriculum, the units are listed as “Introduction to Physics,” “Matter and its Properties,” “Motion and Force,” “Energy, Heat, and Temperature,” and “Electrostatics.” The *Motion and Force* unit, which is among the subjects included in the first semester, carries the most lesson hours of the curriculum (20 out of 72 hours in total). In the ninth-grade Mathematics curriculum, motion problems are included within the *Equations and Inequalities* unit, which forms part of the second semester, and covers a maximum of 6 hours from a total of 24 lesson hours in the curriculum allocated to motion problems.
- In the physics curriculum, the *Motion and Force* unit includes the classification motion types; recognizing the concepts of position, distance, displacement, speed, velocity, time, and acceleration, and the relationships between them; relating the concepts of position, velocity, and time for smooth linear motion; drawing and interpreting mathematical models related to motion through graphics; recognizing the concept of average speed and the concept of acceleration / deceleration; drawing and interpreting velocity-time and acceleration-time graphs; and, calculating average speed from graphs. The mathematical model of acceleration is provided both within the Physics curriculum and the associated textbook, but the mathematical calculations are excluded.

- The velocity-time and location-time graphs are excluded from the mathematics curriculum, although they may relate to motion problems.
- The concept of average speed on motion problems is included in the mathematics textbooks; however, they only involve mathematical operations and graphics are not used.
- The concept of acceleration is excluded from the mathematics curriculum, with motion problems taught using examples of constant speed movements and/or calculations, although this is not the only type of speed encountered in real life. In addition, smooth acceleration and deceleration calculations are excluded from the textbooks. As a result, students may experience difficulties in establishing links between mathematics calculations and daily life.
- The concepts of *catching up* and *collision*, which are considered common in daily life, are excluded from the mathematics curriculum and from the applicable mathematics textbooks. However, if the motion problems were explained by way of using graphics, students may have an easier time understanding how moving objects collide or catch up, and may therefore establish more connections with real-life events.
- To summarize, real-life examples related to *motion* are presented in the Physics course, but the process of analyzing them is left to the mathematics course.

1.2.4. Design of the integrated unit of learning

Since there are various views and models which deal with the integration of science and mathematics, there is no single agreed view regarding the ideal integration (Czerniak, 2007; Morrison & McDuffie, 2009). In the current study, the design and implementation of the integrated unit on learning draws upon two theoretical concepts: (1) the continuum model in the integration of the design and the intended implementation of the integrated unit; and (2) the four-stage model within the design of the integrated unit.

1.2.5. Continuum model of integration

In this research, the design and intended implementation of the integrated unit of learning draws upon the continuum model, as developed by Lonning and DeFranco (1997), which accepts the integration of science and mathematics in a single continuum, as illustrated in Figure 1.

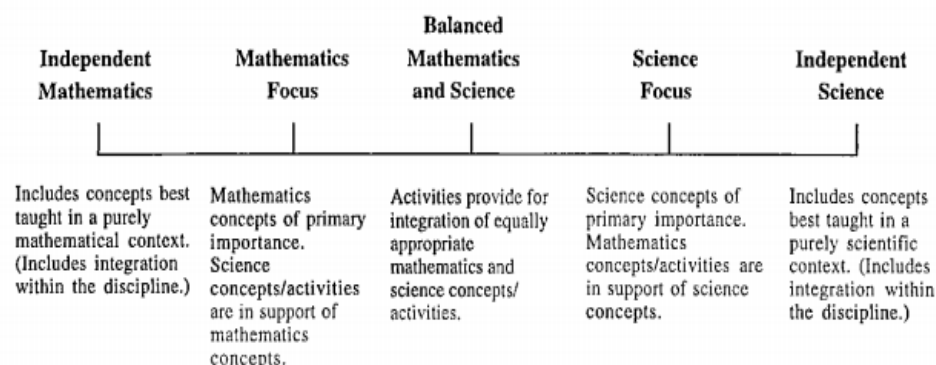


Figure 1: Continuum of integration of mathematics and science concepts/activities (Lonning & DeFranco, 1997, p. 213)

As can be seen in Figure 1, the category at the center of the continuum represents the total integration of both the Science and Mathematics disciplines. At the two opposing ends of the continuum, the Science and Mathematics courses coexist independently, with an emphasis on integration within the discipline. At the intervening points between the two ends and the center, either science or mathematics is at the center whilst the other discipline is used as a vehicle. Concerning how to integrate mathematics and science, one of the recommendations that Berlin and White (1992) and Davison et al. (1995) made was to integrate where an overlap exists between the course content of both mathematics and science, especially on topics that are historically covered or developed in greater depth. *Mathematics focus*, which is the basis taken for the current research, is an approach in which the mathematical outcomes are considered as the basis, whilst the science is regarded as a supplementary discipline. Mathematical outcomes can be reinforced by transferring scientific content at the appropriate points. In other

words, mathematical concepts are deemed to be of primary importance, whilst the science concepts support the mathematics. In the current study, the concept of *Motion Problems* in mathematics was integrated with the concept of *Motion* that was initiated in the Physics classroom. Rather than attempting to fully integrate the learning, which would necessitate that both teachers possess strong levels of content knowledge across both disciplines and would require flexible curricula and course hours, the teachers collaborated on the development of certain curricular units based on the connections established between mathematics and science.

1.2.6. Four-Stage Model

The four-stage model of Jacobs and Borland (1986) was also taken into account in the planning of the integrated course, as: (1) Determination of the subject; (2) Brainstorming; (3) Establishing guidance questions for research; and, (4) Designing and implementing activities.

In the determination of the subject, the findings of three studies were used, in which each referred to the opinions of teachers on the integrated approach (Başkan et al., 2010; Kim & Aktan, 2014; Authors, 2019). According to these studies' findings, one of the most relevant subjects between mathematics and physics for educators was the topic of *Motion*. In addition, since the multidisciplinary general science approach is used in Turkish lower secondary education, it was deemed appropriate to position the integrated mathematics-physics unit in Grade 9 (upper secondary) for the current study, as the transition year for segregated subject delivery. Two mathematics teachers, one physics teacher and the researchers each participated in the brainstorming stage, and consensus was reached with regards to how the courses could be integrated according to the *Mathematics Focus* approach of the continuum model.

In the third stage, various questions were developed so as to contribute to permanent learning through creating guidance questions for the research. Some of these questions were asked directly by the teacher, whilst others were applied to the students in the form of worksheets during the activities. For the final stage, an integrated unit of learning was prepared by the researchers and teachers as a design and implementation activity. In order to avoid the so-called *potpourri problem*¹, which is one of the most commonly encountered problems in the design of integrated courses, the participating teachers actively took part in the design work, in determining the nature and degree of the integration, as well as the scope and order of the study.

1.2.7. The integrated unit of learning

The integrated unit of learning consisted of six lessons in total to be practiced over a period of 2 weeks (see Table 1). The purpose of the integrated unit of learning is to facilitate the development of students' mathematical concepts and skills through concrete real-life experience, and to demonstrate the connectivity and relevance between both subjects with a view to engaging students in meaningful learning (Furner & Kumar, 2007). The lesson plans were underpinned using the theoretical frameworks detailed in the two previous subsections, whilst demonstrating the linkage, interconnection, and development of motion problems (speed, distance, and time) in mathematics lessons initiated during physics lessons, and a framework as introduced in the section entitled *Ninth-grade Mathematics and Physics curricula / textbooks*. In the creation of the Integrated unit, the students' preexisting background information regarding the *Motion* topic from the first semester's Physics course was taken into consideration. How the students' prior knowledge acquired from their physics lessons was used within the integrated lesson is presented in Table 1.

¹ For example, if the subject is Ancient Egypt, it will necessarily encompass a bit of history about Ancient Egypt, take a look at the literature, plus some aspects of the arts etc. Jacobs (1989) criticized this approach for its lack of focus, referring to Bloom and Hirsh, and named this as the "potpourri problem." According to Jacobs, unlike disciplines with an inherent scope and sequence, there is no generalised structure to interdisciplinary work.

Table 1: Students' prior knowledge of motion from physics lesson and how it is applied to mathematics lessons

Elements covered in physics lesson about motion (students' prior knowledge)	Integrated mathematics lesson
Classification of motions of objects (very fast, accelerating, decelerating situations)	In order to draw attention to the subject, based on the examples in a newspaper article about objects moving very fast in space, objects that move at a constant speed, as well as objects that accelerate, and slow down are mentioned.
Speed-time and position-time graphs	In the lessons, the students are reminded about the related concepts of the physics lesson using different teaching methods (e.g., question-answer, brainstorming, case study, etc.) in order to relate their previous learning to new learning. Besides mathematical expressions (non-graphical), graphics are also used in teaching the concepts of position, travel, displacement, and motion (through lectures and problem solving). In this way, students are able to make comparisons between both situations.
Speed-time and position-time graphs Object acceleration and deceleration (accelerated motion)	The concept of acceleration is explained using acceleration and deceleration events. Various graphs such as velocity-time and position-time graphs are used. Graphs and mathematical expressions are used to calculate the average velocity of an object moving with a constant velocity. How the average velocity of the objects moving with a constant velocity as well as of the objects accelerating and decelerating is calculated and explained. In the calculation of average velocity, in addition to the constant velocity, the average velocities of the accelerating and decelerating objects are explained with the help of graphs.
Situation of one moving object with respect to another Catch up /collision situations via accelerating/decelerating motion	Collisions of vehicles moving in the same direction or towards each other at a "constant speed," as well as the collision situations of vehicles accelerating or decelerating are explained (e.g., when a faster-moving vehicle hits the vehicle in front). Both non-graphical and graphical (velocity-time, position-time) examples of these situations are given. In order to correlate the subject of movement with daily life, an explanation of the situation of a mobile object with respect to another, which is not included in the content of the mathematics lesson, is included in the content of the integrated course.

A description of the integrated unit applied to the two experimental groups is presented in Table 2.

Table 2: Description of integrated unit

Sequence and description of lessons	
Lesson 1	Lesson purpose: to provide students with a holistic perspective to help them realize the importance of and need for motion in daily life, and how mathematics and physics are two closely-related systems. Apart from objects moving with "constant speed" (mathematics lesson content), objects that accelerate and decelerate are also mentioned. In addition, very fast-moving objects in space are mentioned, and a brainstorm conducted on what could happen when objects move extremely fast, i.e., close to the speed of light. These issues are emphasized by referring to the ideas and theories of the late renowned astrophysicist, Professor Stephen Hawking.
Lesson 2	Lesson purpose: to provide students with key skills required for calculating the average speed of objects in constant motion. The basic concepts of the subject are provided, together with an explanation of constant motion. The basic speed equation, $S = D / T$ (S: Speed, D: Distance, T: Time) and its relevant units are explained. On this, units of speed, distance, and time are given and applications conducted about how unit conversions are made. No direct relationship is established with the Physics course.

Sequence and description of lessons	
Lesson 3	Lesson purpose: to explain the movement of two objects moving towards each other at a constant speed, and the position of objects moving at a constant speed around a circle. Situations related to vehicles moving in the same direction or towards each other at a “constant speed” are included. Sample questions regarding the vehicles’ encounter times when moving on the same road are resolved. Applications of the basic speed equation ($S = D / T$) are included in the questions on this topic. No direct relationship is established with the Physics course.
Lesson 4	Lesson purpose: to further develop the students’ understanding of graphical concepts (slope and area) in relation to speed, distance, and acceleration in mathematics. This involves solving sample questions on the use of velocity–time and position–time graphs that students will have learned initially in their previous physics lessons. The concepts of slope and area used as speed and distance in mathematics are explained, together with example questions. Average velocities of objects in constant motion are taught using graphics. Additionally, the concept of acceleration is revisited using questions on average speed according to accelerated and decelerated movement.
Lesson 5	Lesson purpose: to enable students to establish more realistic connections between the subjects and daily life. Objects moving with respect to other moving objects, and the collision cases of accelerating or decelerating vehicles are explained, e.g., a faster moving object hitting an object moving in front of it. Moving objects are explained according to different reference points, with the concepts of catching up and collision explained both transactionally and graphically.
Lesson 6	Lesson purpose: to increase the students’ familiarity with the average speed formula through mathematical tasks from a worksheet focused on speed, distance, and time. Tasks involve real-life applications to make the material relevant and meaningful. Sample applications about average velocity calculation and collision situations use velocity–time and position–time graphs. The aim being that students can associate graphics learned in the physics lesson and repeated in the mathematics lesson.

A description of the mathematics lessons applied to the two control groups is presented in Table 3.

Table 3: Sequence and description of the mathematics lessons

Sequence and description/ purpose of lessons	
Lesson 1	Lesson aim: to introduce the basic concept of motion. In order to attract student learners’ attention, questions are asked related to the importance of the concept of motion in daily life, and a brainstorming activity is performed. Potential differences between the states of a vehicle moving at a constant speed, accelerating, or decelerating are discussed. The movement of a vehicle at “constant speed” is used to explain the basic concept of motion. The basic equation of speed, $S = D / T$ (S: Speed, D: Distance travelled, T = Time elapsed) is explained; with units of speed, distance, and time applied as unit conversions.
Lesson 2	Lesson aim: to teach the basic components of movement, with questions included based on the basic velocity equation, i.e., the displacement of a vehicle moving at “constant speed.” The questions include expressions about the displacement of a vehicle moving at a constant speed between two points, with students tasked with finding a third value from two given values (i.e., distance, time, and speed).
Lesson 3	Lesson aim: to introduce the concept of “average speed,” with preliminary information obtained by questioning why average speed is needed and how it can be calculated. Then, how to calculate the average speed of a vehicle moving at “constant speed” is explained, together with the appropriate formula. The subject is then reinforced by solving non-graphic questions, with examples given on calculating the average speed of vehicles moving at different speeds on different roads.
Lesson 4	Lesson aim: to address situations related to the encounters of vehicles moving in the same direction or towards each other at “constant speed,” with sample questions about the encounter times of vehicles moving on the same road. The questions include applications of the basic speed equation ($S = V / T$) introduced in Lesson 1.

Sequence and description/ purpose of lessons	
Lesson 5	Lesson aim: to readdress the vehicular encounters taught in Lesson 4 on circular roads (i.e., encounter situations of vehicles moving towards each other at “constant speed” on a circular road), reinforced through the solving of examples.
Lesson 6	Lesson aim: to readdress the concept of constant speed (as learned in previous lessons), exemplified in different situations. For example, sample questions about vehicles passing through a tunnel or of a person moving on a river.

2. Method

2.1. Research Model

In the current study, a quasi-experimental research design was applied according to a pretest–posttest approach with control and experimental groups taken *as-is* from their institutions or from their natural environment (Creswell & Creswell, 2017). The data from the two schools were analyzed separately. In addition, in order to elicit a deeper understanding of the participant students’ development of their motion problem solutions through the integrated design, *post-hoc content analysis* of selected papers with large gain scores on specific items was conducted.

2.2. Participants and Context of Research

The study’s participants consisted of 131 ninth-grade students from two different Anatolian high schools in the Kocaeli province of Turkey. In the first school (PAL), the experimental group (PAL Ex) consisted of 34 students, whilst the control group (PAL C) had 32. At the second school (KAL), the experimental group (KAL Ex) consisted of 33 students, whilst the control group (KAL C) had 32. In forming the study group, convenience sampling was applied, which aimed to select individuals and groups to be researched most easily (Creswell & Plano Clark, 2011). This method was employed in order to see the effect of the study’s experimental process on two different schools that shared similar backgrounds, but differed according to LGS examination scores at the institutional level. The LGS scores for the first school, PAL, were considered to be *low moderate/moderate* (average score: 407.60), whilst the second school, KAL, had an institutional average score of 478.12, which was *the highest* amongst the 54 Anatolian high schools in the Kocaeli province in the year that the study was conducted. To put those scores into context, the lowest average institutional score that year was 362.76.

In determining the individual teachers who would conduct the experimental procedure, the teachers’ seniority (13 to 14 years of teaching experience) and their voluntary agreement to take part in the study were taken into consideration. In order to minimize errors during the experimental process, both the experimental and control groups at each participant school had the same physics and mathematics teachers. In order to assess whether or not the courses were conducted in accordance with the design of the unit, i.e., in view of treatment fidelity, the researchers were also involved as direct observers in both the experimental and control groups’ activities at both schools and noted the absence or presence of each treatment component (Lane et al., 2004).

2.3. Data Collection Instrument

An achievement test was administered in accordance with the objectives of the lessons defined in the curriculum. At the stage of developing the test, a table of specifications was first prepared and then opinion was sought from two Mathematics Education experts, two Physics Education experts, and one Assessment and Evaluation expert, each of whom worked at University, in order to ensure validity of the study’s scope. Preliminary application of the 20-item achievement test was conducted at the second school (KAL) with 71 students from the 10th grade who had completed that subject in their previous academic year. Following item-level analysis using MS Excel, three questions whose item difficulty was assessed as between .20 and .30 were excluded from the test. The remaining 17 items had a mean difficulty of .48, a mean discrimination of .47, and a KR20 reliability coefficient of .72. Accordingly, the achievement test can be said to be of moderate difficulty, and a highly distinctive and reliable test. MS Excel was used to conduct the study’s reliability analysis, item difficulty index, and item discrimination index of the achievement test.

In applying the data collection instrument, in order to test whether or not the students made connections based on the common central concept of *motion* and to interpret its different expressions, six pairs of questions (total 12 questions) were prepared on the same content, but according to different styles (e.g., Question 8 and Question 11 in Appendix). In other words, six questions were expressed in mathematical terms and six based on graphics. Two other questions in the test were solvable using only mathematical formulae (e.g., Question 3 in Appendix), and two could be resolved by analyzing graphics which the students had previously learned in their Physics course prior to the experiment, or from establishing proportion which they were supposed to accomplish in the mathematics course following the experiment (e.g., Question 17 in Appendix). Finally, one question could only be resolved by analyzing the graphics which had been previously learned in the Physics course (see Question 7 in Appendix). This means that nine questions in the achievement test could be resolved from the outcomes of the Physics course taken prior to the current study's experiment. Six questions (referred to as *Integrated Questions*: e.g., Question 8 and Question 17 in Appendix), whose item discrimination and difficulty index are considered high, were especially designed to understand if the students were able to integrate the outcomes of both the Physics and Mathematics courses. The achievement test administered during the data collection process was applied to all participants under the same conditions.

2.4. Data Analysis

Two mixed-factor ANOVA analyses were applied using IBM's SPSS program (version 21) to test for significant differences between the test scores of the participant groups and for changes within the groups. A significance level of .05 was taken as the basis for the analysis of the collected data. In order to examine the effect size of the analysis, partial eta square coefficients were calculated, with an effect size of .01 or close to it considered *low*, whilst an effect size of .06 or close to it was considered *medium*, and an effect size equal to or greater than .138 was considered *high* (Cohen, 2007).

In addition, whether or not the groups had normal distribution was checked as part of the data analysis. To analyze the students' achievement tests, content analysis was employed in order to evaluate the effect of the integrated unit on the students' understanding of the connections that link science and mathematics, and also the development in their solutions to motion-related problems. In the content analysis, for selection of the participants' achievement tests, extreme (or deviant) case sampling, a type of purposive sampling used to focus upon cases considered special or unusual (Patton, 2015), was used in order to elicit a deeper understanding of the participant students' development in solving the motion problems through the integrated design. First, the students' scores from the pretest and posttest for both the experimental and control groups at both schools were examined in order to provide a general framework. Then, selected answer papers were analyzed individually on the basis of each question in the achievement test.

2.5. Experimental Process

In the two schools' experimental groups, education was applied according to the integrated approach (with the relationship established by the teacher), which forms the basis of the section titled *Integrated Unit*. For the two control groups, the education was given on the basis of *Motion Problems* and with segregated subject delivery (with the relationship established by the student). In other words, the graphics in the physics lesson were not used in problem-solving for the control groups, the concept of acceleration was not mentioned, and the average speed questions were explained only with numerical operations and without the use of graphics. Since the concept of acceleration was not mentioned, situations relating to acceleration or deceleration in movement were not included in the course content, and lessons only taught according to *constant speed movement*. Relating the concepts learned in the physics lesson with the mathematics lesson is left to the student. How the lessons are handled in the control groups is included in Table 3. Following the implementation, a posttest was applied to both the experimental and the control groups in order to measure the participant students' achievement related to motion problems.

In the preliminary analysis performed to check whether or not the data of the pretest applied to the experimental and control groups were distributed normally, the results showed the data to be normally distributed, according to the Shapiro-Wilk test regimen (PAL Ex: $df = 34$, $p = .053$; PAL C: $df = 32$, $p = .070$; KAL Ex: $df = 33$, $p = .065$; KAL C: $df = 32$, $p = .070$). For this reason, independent sample *t*-test was used to determine whether or not a

significant difference existed between the pretest results of the control and experimental groups of each participant school. The results of the analysis are presented in Table 4 and Table 5, based on the highest score obtainable being 17 points).

Table 4: Comparison of pretest scores: PAL Ex and PAL C

Group	Pretest scores (<i>SD</i>)	<i>t</i> value	<i>p</i> value
PAL Ex (<i>n</i> = 34)	3.17 (2.28)	.678	.500
PAL C (<i>n</i> = 32)	2.81 (2.05)		

Table 5: Comparison of pretest scores: KAL Ex and KAL C

Group	Pretest scores (<i>SD</i>)	<i>t</i> value	<i>p</i> value
KAL Ex (<i>n</i> = 33)	7.64 (3.11)	.669	.506
KAL C (<i>n</i> = 32)	7.15 (2.59)		

As can be seen from the preliminary results presented in Table 4 and Table 5, the pretest analysis showed that no statistically significant difference existed between the experimental and control groups of either school based on a .05 significance level ($p > .05$). This finding shows that the readiness of all four groups was similar prior to the application of the experimental process.

3. Findings

The pretest and posttest results of the academic achievement test for the experimental and control groups at the first school (PAL) are presented in Table 6.

Table 6: Descriptive statistics of pretest and posttest scores: PAL Ex and PAL C

Group	Pretest scores (<i>SD</i>)	Posttest scores (<i>SD</i>)
PAL Ex (<i>n</i> = 34)	3.17 (2.28)	8.32 (3.44)
PAL C (<i>n</i> = 32)	2.81 (2.05)	3.59 (2.36)

When Table 6 is analyzed, it can be seen that a significant difference was found to exist between the pretest ($\bar{x} = 3.17$) and posttest scores ($\bar{x} = 8.32$) of the Experimental Group (PAL Ex). There was also a significant difference found to exist between the pretest ($\bar{x} = 2.81$) and posttest scores ($\bar{x} = 3.59$) of the Control Group (PAL C). When the posttest mean scores are examined, a 4.73 points difference can be seen between the Experimental and Control groups. Based on this finding, it can be said that the first school (PAL), having low moderate/moderate LGS scores, showed an increase in the achievement levels of both the Experimental Group's students (with integrated lessons) and the Control Group's students (current curriculum based on segregated subject delivery). Whether or not these differences were statistically significant was then examined and the results presented in Table 7.

Table 7: NOVA results of pretest–posttest scores of experimental and control groups: PAL

Source of variance	Sum Sq.	df	Mean Sq.	F-value	p-value	η^2
Between groups	713.969	65				
Group (Ex/C)	213.860	1	213.860	27.368	.000	.300
Error	500.109	64	7.814			
Within groups	815.649	66				
Assessment (pretest–posttest)	289.679	1	289.679	50.261	.000	.440
Group assessment	157.103	1	157.103	27.258	.000	.299
Error	368.867	64	5.764			
Total	1,529.618	131				

While the effect of the integrated lesson was investigated in the experimental design, two main effects and overall effects were tested. In view of the first main effect, whether or not there was a significant difference between the students of the Experimental Group (PAL Ex) and the Control Group (PAL C), regardless of their pretest–posttest scores, was investigated and a significant difference was found to exist between the achievements of the two groups ($F = 27.368$; $p < .05$). When the effect size of the measurement between the pretest and posttest is examined, it can be seen that the change represents a high effect size ($\eta^2 = .300$). In view of second main effect, irrespective of the experimental and control groups, the difference between the students' pretest and posttest scores was investigated and a significant difference found to exist between the two measurements in favor of the posttest scores ($F = 50.261$; $p < .05$). The change found represents a high effect size ($\eta^2 = .440$) of the measurement between the pretests and posttests. As can be seen from Table 6, an increase was seen between the posttest scores of the groups.

Finally, the overall effect of the group and measurement was investigated, and a significant difference was found to exist between the pretest and posttest scores of all students ($F = 27.258$; $p < .05$), i.e., both the Experimental Group and Control Group of the first school (PAL). The change found represents a high effect size ($\eta^2 = .229$) in the measurement between the pretest and posttest. It was observed that the students' achievements differed according to the form of instruction applied, and for the integrated course (Experimental Group), the students' achievements increased significantly more than for the students in the segregated (Control Group) Mathematics and Physics courses. These results show that the integrated course had an impact on student achievement. The pretest and posttest results of the academic achievement test for the Experimental Group and Control Group at the second school (KAL) are presented in Table 8.

Table 8: Descriptive statistics of pretest–posttest scores: KAL Ex and KAL C

Group	Pretest scores (<i>SD</i>)	Posttest scores (<i>SD</i>)
KAL Ex ($n = 34$)	7.63 (3.16)	11.93 (2.99)
KAL C ($n = 32$)	7.15 (2.59)	7.75 (4.00)

When the results presented in Table 8 are analyzed, it can be seen that there was a significant difference found between the Experimental Group's (KAL Ex) pretest ($\bar{x} = 7.63$) and posttest scores ($\bar{x} = 11.93$) for the second school (KAL), which had high-level LGS scores. A significant difference was also found between the pretest ($\bar{x} = 7.15$) and posttest scores ($\bar{x} = 7.75$) of the second school's Control Group (KAL C). When the posttest mean scores are examined, it can be seen that a 4.73 points difference exists between the students of the second school's Experimental and Control groups. Based on this finding, it can be said that the students of the second school had an increase in their achievement level for both the Experimental Group (KAL Ex) students (integrated lessons) and the Control Group (KAL C) students (current curriculum based on segregated subject delivery). Whether or not these differences are statistically significant was then examined, and the results are presented in Table 9.

Table 9: ANOVA results of pretest–posttest scores of experimental and control groups: KAL

Source of variance	Sum Sq.	<i>df</i>	Mean Sq.	<i>F</i> -value	<i>p</i> -value	η^2
Between groups	1,048.508	64				
Group (Ex/C)	177.118	1	177.118	12.805	.001	.169
Error	871.390	63	13.832			
Within groups	746.886	65				
Assessment (pretest–posttest)	194.779	1	194.779	27.867	.000	.307
Group assessment	111.763	1	111.763	15.990	.000	.202
Error	440.344	63	6.990			
Total	1,795.394	129				

The results presented in Table 9 show that, regardless of the pretest–posttest scores, there was a significant difference found to exist between the academic success of the two study groups from the second school (KAL) ($F = 12.805$; $p < .05$). When the effect size of the measurement between the pretest and posttest was examined, it can be seen that the change represented a high effect size ($\eta^2 = .169$). As for the second main effect, irrespective of the second school's experimental and control groups, the difference between the students' pretest and posttest scores was investigated and a significant difference was found to exist between the two measurements, in favor of the posttest scores ($F = 27.867$; $p < .05$). The change represented a high effect size ($\eta^2 = .307$) of the measurement between the pretest and posttest at the second school (KAL). As can be seen from Table 8, there was an increase seen in the posttest scores of the combined groups.

Finally, the overall effect of the group and measurement was investigated for the second school (KAL), and a significant difference was found to exist between the pretest and posttest scores of the Experimental Group (KAL Ex) and Control Group's (KAL C) students ($F = 15.990$; $p < .05$). The change was found to represent a high effect size ($\eta^2 = .202$) in terms of the measurement between the school's pretest and posttest results. It can therefore be observed that the students' academic achievements differed according to the mode of instruction applied, and the academic achievements of the students trained with integrated design increased more than that of the students who received segregated delivery. These results show that the integrated program impacted on the students' achievement level.

In content analysis, in order to reveal what kind of differences were found between the students' solutions to motion problems in the achievement test prior to and following the implementation, 10 papers selected through extreme, or deviant, case sampling were analyzed on a question-by-question basis. Papers with the lowest pretest

scores (between 0 and 4 points) and a maximum posttest score (17 points) were selected for analysis, and thereby represented the widest pretest–posttest increase differential (see Table 8). All 10 selected papers were from the experimental groups, as no paper from the control groups met the criterion. Following the initial analysis of the 10 papers, five criteria were created: (1) number of questions answered correctly in the test; (2) number of six-paired questions that were answered correctly; (3) number of questions that were solved through graphics; (4) number of questions that were solved based graphic interpretation; and, (5) number of *integrated questions* answered correctly.

Table 10: Content analysis of participants' pretest–posttest solutions to “motion problems”

Participant code	Pretest (correct answers/ questions answered)	Posttest (correct answers/ questions answered)
PAL 54	0 / 5	12 / 17 Correctly answered five paired-questions, and realized Question 11 was an alternative of Question 8 (responded with “8 is the same with 11”). Correctly answered six questions based on graphic interpretation, resolved six motion problems by drawing or using graphics, and correctly answered five <i>integrated questions</i> .
PAL 52	1 / 5 Correctly answered speed–time graph question only.	12 / 17 Correctly answered five paired questions, six questions based on graphic interpretation, resolved four motion problems by drawing and/or using graphics, and correctly answered five <i>integrated questions</i> .
PAL 58	1 / 17 Correctly answered speed–time graph question only.	12 / 17 Correctly answered all six paired questions, six questions based on graphic interpretation, resolved six motion problems by drawing and/or using graphics, and correctly answered all six <i>integrated questions</i> .
KAL 6	1 / 9 Correctly answered speed–time graph question only.	13 / 17 Correctly answered four paired questions, six questions based on graphic interpretation, and five <i>integrated questions</i> .
PAL 34	2 / 2 Correct answers not based on graphic interpretation.	11 / 17 Correctly answered four paired questions, and realized Question 10 was an alternative of Question 2 (responded with “same question as on the front page”). Correctly answered five questions based on graphic interpretation, and five <i>integrated questions</i> .
PAL 38	3 / 6 Two correct answers based on graphic interpretation, plus one integrated question.	14 / 17 Correctly answered four paired questions, seven questions based on graphic interpretation, resolved one motion problem by drawing and/or using graphics, and correctly answered all six <i>integrated questions</i> .
PAL 48	3 / 7 No correct answers based on graphic interpretation. One correctly answered integrated question.	12 / 17 Correctly answered all six paired questions, and realized Question 12 was an alternative of Question 9 (responded with “same as for Question 12”), and Question 13 was an alternative of Question 5 (responded with “it is the graphic form of Question 5”). Correctly answered six questions based on graphic interpretation and resolved one motion problem by drawing and/or using graphics, and correctly answered all six <i>integrated questions</i> .
KAL 25	4 / 12 Two correct answers based on graphic interpretation.	14 / 17 Correctly answered all six paired questions, all six questions based on graphic interpretation, resolved three motion problems by drawing and/or using graphics, and correctly answered five <i>integrated questions</i> .

Participant code	Pretest (correct answers/ questions answered)	Posttest (correct answers/ questions answered)
KAL 10	6 / 11 Two correct answers based on graphic interpretation, plus one integrated question.	17 / 17 Resolved three motion problems by drawing and/or using graphics.
KAL 12	6 / 17 Two correct answers based on graphic interpretation, plus one integrated question.	17 / 17 Resolved six motion problems by drawing and /or using graphics.

As a result of the content analysis, it can be seen that the students experienced some difficulties in solving certain questions asked in the pretest, both in quantitative and qualitative form, but following the experimental treatment their responses progressed significantly in solving the motion-related problems. The integrated approach was shown to have contributed not only to the solution of motion-related problems in mathematics, but also improved their ability to interpret graphics in physics. From the posttest results, it can be said that those students with both high and low-moderate/moderate LGS school entry scores performed better in resolving motion problems in different ways, in perceiving different interpretations of questions, and in their interpretation of graphics. According to the results of both ANOVA testing and the content analysis, the integrated course in both schools increased student success over and above that of the current curriculum courses based on segregated subject delivery.

4. Conclusion and Discussion

Since mathematics and science are regarded as important subjects for the education of upper secondary students, there are many potential benefits to be realized from integrating the teaching of these two subjects (Czerniak, 2007). The aim of the current study was to examine the key aspects of designing an integrative course for the teaching of mathematics. The researchers' interest was also to develop an understanding about what should be integrated and how it should be achieved, which are questions still considered by educators to be crucial (Authors, 2019), and especially in school systems grounded on a culture of segregated subject delivery. In other words, the current study presents an example of how one central topic can be integrated in two distinct yet related disciplines under limited conditions, with a focus on classroom implementation within a normal school context, e.g., prescribed centralized syllabi, with limited school resources and timetabling, providing compartmentalized education.

Rather than attempting a fully-integrated learning scenario, which would require both sets of teachers to possess strong content knowledge across both disciplines, in addition to more flexible curricula and course hours, the teachers collaborated on the development of curricular units based on the disciplinary connections between mathematics and science. Based on the findings of the current study, it is clear that the integrated design provides an opportunity for students to better understand the concept of *motion* within a broader context, and that the integrated course strengthened the students' ability to establish connections between two courses, even within a school culture based on segregated subject delivery and inflexible course schedules. However, the current study's results differ from the views of Dervişoğlu and Soran (2003) and also from Karakuş and Aslan (2016), who each claimed that integrated instruction could not be realized with the current restrictive course structure in operation. One of the strengths of the current study is perceived to be in the richness of its sampling. The study was conducted with students from two different schools with different LGS entry scores. The study's results demonstrated that students from a school with an average low-moderate/moderate LGS entry score could make the same interdisciplinary associations as students from a school with a high average level of LGS entry score. In other words, the study has shown that students with historically lower levels of academic success in both these disciplines can also establish strong bonds through the implementation of the integrated lesson model.

On the other hand, the significant difference reported between the experimental and control groups in the posttest and the results of the content analysis clearly shows that students in the control groups were hardly able to see the connection between the mathematics and physics on the subject of *motion*, which supports the findings of Yıldırım (1996) and Özçelik (2015) that it is not possible for students to realize relations in learning across all subjects. Considering the results of the current study's content analysis, the results showed that students with lower levels of academic success may make greater progress in this area and go on to resolve more complex problems when a relation is made by the teacher during mathematics teaching, rather than finding that connection for themselves. Given the difficulty encountered in relation to timetabling and support structures at the school level, and teachers' knowledge and perceptions of the respective subjects, research examining the teaching and learning of mathematics within science and/or science within mathematics certainly warrants further investigation. Similarly, a key purpose of introducing such an initiative in the current study was to demonstrate the linkage and connection between the subjects. Within the Turkish K-12 education system, these subjects are taught purely in isolation. Therefore, further examination of both subjects' curricula would be beneficial in order to identify other key elements that could be integrated in future programs.

One of the most important barriers to integrated teaching is related to the teachers' own professional qualities. Most teachers are subject specialists by virtue of their training, and therefore do not possess the necessary knowledge or confidence to integrate the language, methods, concepts, or content of another discipline into their teaching (Basista & Mathews, 2002). For the teachers participating in the current study, this was their first time undertaking such an initiative within their teaching careers, and the researchers believe that any research based on integrated instruction should include both teachers and researchers working in collaboration, which was also stated by Riordáin et al. (2016). The researchers conclude that teachers are in need of support in order that they may embrace new pedagogical and content approaches in the teaching of mathematics and science.

Another barrier to integrated teaching is that no clear formula for such implementation exists; with no single view regarding the ideal integration (Czerniak, 2007; Morrison & McDuffie, 2009). In the current study, *mathematics with science* from the continuum model of integration does not constitute total integration. Considering that this experiment was performed according to certain limitations (i.e., under "normal school conditions"), and that the association was of a medium level based on selecting examples from the subjects of physics and mathematics and selecting examples from daily life, more effective results may be obtained with lessons based on stronger and more robustly aligned correlations. While the current study has helped to broaden our understanding of how to integrate the *science for mathematics* approach within the continuum model, the researchers believe that further study is required on course plans with total integration, and the key role of the schools is to provide support to teachers to engage in these types of initiatives.

In Turkey, most academic studies on integrated teaching are theoretical, or reflect the opinions of teachers on integrated courses (Turna & Bolat, 2015). It is therefore hoped that the current study's findings will be seen as an example to follow, providing a source for researchers and educators to refer to in creating their own integrative course designs.

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This study is developed from the master thesis of the first writer under the supervision of the second writer.

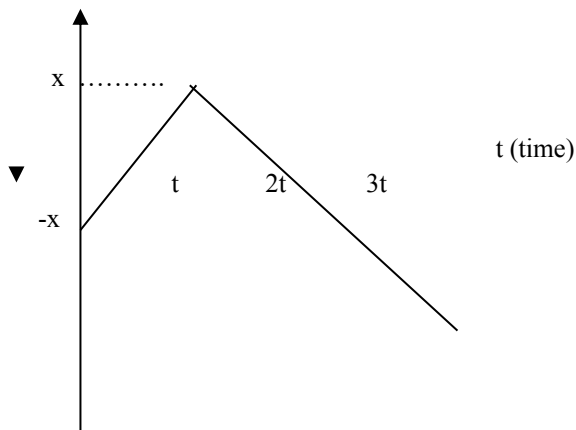
Appendix: Examples from Achievement Test

Question 3

How many seconds does it take to complete two laps around a moving track which moves at 30 m / sec on a circular track with a circumference of 0.3 km?

Question 7

x (Position)

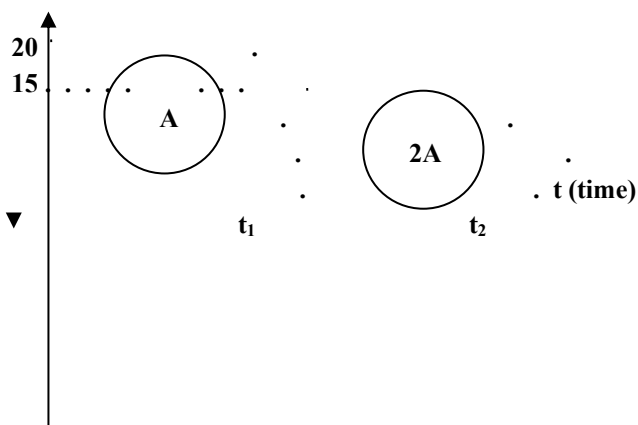


Which of the following judgements about the motion given above position-time graph is correct?

1. It is at the point where it starts moving.
2. It is about x away from the starting point.
3. Total movement time of the mobile is $3t$.

Question 8

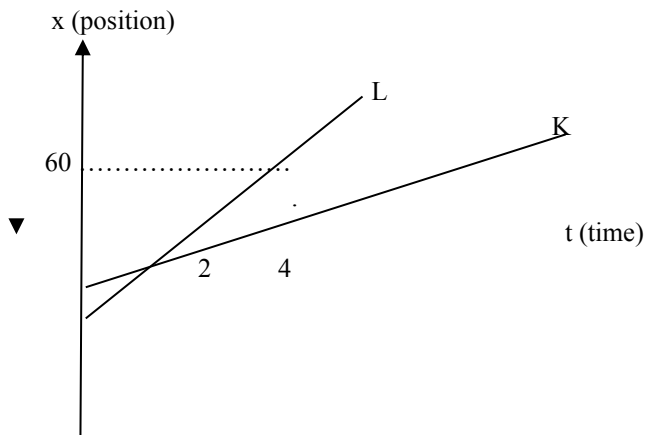
V (speed)



In the figure, the speed-time graph of a vehicle is given. Since the area of the rectangle on the left is A , and the area of the rectangle on the right is $2A$. **What is the average speed of the vehicle during this movement?**

Question 11

A vehicle has travelled a third of the road it traveled at 20 m / sec and the rest at 15 m /sec. **What is the average speed of the vehicle during this movement?**

Question 17

In the figure, the position on-time graph of two vehicle is given. **Accordingly, how many hours after the movement of L will the distance between them be 90 km?**

The Effect of Genre-Specific Strategy Instruction on the Writing Achievement of Fourth-Grade Students

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Abstract

The quality of writing instruction is the primary determinant of writing acquisition. Revising and feedback are crucial aspects of the writing process. In this study, genre-specific strategy instruction was used as part of feedback and revision to develop the text structure and content of different text types in fourth grade. The study also examined whether the effect differed based on the genre and students' gender. Thirty students' first and final drafts of opinion, expository, and argumentative texts were analyzed using rubrics for each type of genre. The results revealed no significant difference between female and male students' achievement in any different genres, but using this approach significantly affects students' total achievement in writing. Students' average persuasiveness in opinion and argumentative writing was not developed well when thinking about the genre elements in developing text structure and content. Writing expository texts achieved the highest scores. Strategy instruction for explicit guidance on the structure of the genre and using genre-specific criteria to revise draft texts are important writing strategies to raise the quality of writing.

Keywords: Genre-Specific Strategy Instruction, Revision Writing Achievement

1. Introduction

Although writing is considered a fundamental literacy skill, many students consistently underperform because becoming a competent writer depends on learning complex skills that require sufficient time and quality of instruction (Graham et al., 2012). Compared to reading, there is a lack of research and evidence to support instructional practices in writing due to the high level of variation in writing instruction and the complexity of the skills (Graham et al., 2011). The variation in writing instruction supports the need for research on writing and the implementation of evidence-based practices to respond to the needs of students. Inquiry alternate ways of organizing the writing instruction are also essential to move toward new approaches.

One challenge students face in writing is changing tasks that vary by genre, in which conventional structures are used to organize information to create texts for different purposes (Biber & Conrad, 2019). Unlike middle-grade students, elementary students know less about writing informative or persuasive text (Lin et al., 2007). Students in elementary grades are rarely exposed to reading persuasive or argumentative texts and teachers reported that they spend considerable time teaching writing stories and rarely opinion essays (Sulak, 2018). Lack of exposure

to different genres in writing instruction creates a limited understanding of the text structures and schemas for persuasive and later argumentative reasoning (Finlayson & McCrudden, 2020). The lack of knowledge of the structure of an argument also creates a poorly organized essay with an absence of the transition to connect different parts of the text (Deane & Song, 2015). The second challenge is applying writing processes, including planning, drafting, revising, etc. Although it is a widely used model of writing as a process approach led by Calkins (1994), there is limited research on its effectiveness (McCarthy & Geoghegan, 2016). The last is the country's overall situation, like population, politics, admission, centralized curricula, and teacher education programs. The knowledge produced from the intellectual and practical experience of many years reflects the characteristics of the civilization in which the research was conducted. The higher evidence of the recommendations on writing instruction for elementary grades might not be that strong in another study context. Compared to the United States or Western societies, developing countries need more research-based evidence to build their practices to teach writing and avoid theory–practice contrast. National standards (1st to 8th grades) in Turkey explicitly emphasize the stages of writing as a process approach with the renovation of the curriculum standards in 2018 (M.E.B, 2019). Also, it is too new to the teachers to fully implement it in the classroom. Addressing the teacher for changing writing instruction without addressing the system and society will fail (Bransford et al., 2005; Graham, 2019). However, the quality of instruction needs to be changed in classroom writing practices that are affected by teachers' beliefs and knowledge (Graham, 2019; Troia et al., 2011).

This study was designed to address the challenges described above. Therefore, this study was planned as a long-term study to examine how to implement a process approach to teaching writing in elementary school classes. The study was conducted with an elementary teacher as a research partner. The elementary teachers are vital in implementing a process approach to develop children as reflective authors who can draft and revise their texts in response to peer and teacher feedback. This part of the study concerns examining the effect of genre-specific strategy and evaluation within the scope of revision and feedback on the development of text structure and content of different genres, including opinion, expository and argumentative writing of fourth-grade students. In the Turkish context, the focus of the studies related to writing instruction is mostly on narrative essays and middle school students (Graham et al., 2021). However, persuasion and argumentation are challenging tasks for even middle-grade students. According to the meta-analysis of the experimental studies examining the effectiveness of writing interventions conducted in schools in Turkey from primary grades to college, strategy instruction is found to be an effective treatment for improving the writing quality of Turkish students compared to the other interventions (peer assistance, pre-writing and process writing). On the other hand, it is a less scientifically tested instructional method, according to the meta-analysis of writing interventions in Turkey (Graham et al., 2021).

1.1 Theoretical Framework

The ongoing attention and argument over the conceptualizations of writing development are due to its complex nature, with many distinguishable tasks and processes that do not develop naturally and require a significant amount of instruction and practice. Hillocks' (1987) meta-analysis created a growing interest in process-oriented approaches to teaching writing in elementary schools (Chapman, 2006) and dominated during the following decade as a pioneering writing approach (McCarthy, 2008). This approach is characterized by different stages, including student-selected writing topics, planning, drafting, revising, teacher-student and peer conferences, editing, and publishing, that are the cognitive process of writing (Calkins, 1994; Emig, 1971; Flower & Hayes, 1981; Graves, 1983; Tompkins, 2007). Teaching writing as a process approach has become an effective paradigm and is widely used in elementary classrooms, but its effectiveness varies. The difficulty of assessing the effectiveness of process approaches broadly comes from the teachers' practices that are implemented in different ways that demonstrate varying degrees of positive effects on student achievement (Lipson et al., 2000; McQuitty, 2014; Pritchard & Honeycutt, 2006). While McCarthy's (2008) study demonstrated a variety of instructional approaches used across classrooms, Lipson et al. (2000) found that even teachers who profess to use the same approach to teaching writing often differ in how they implement it. The process-oriented approach has been criticized for not being the most appropriate writing instruction for those with different backgrounds and historically marginalized groups (Delpit, 1988; Lensmire & Satanovsky, 1998). This approach is also criticized for being ineffective in improving the quality of writing as it focuses on the process such as drafting, revising, editing, and sharing their work while ignoring the quality of writing (Baines et al., 1999).

Later, a more balanced approach between teacher-directed and student-directed activities was adopted in writing instruction (Pritchard & Honeycutt, 2006). Developing and integrating different approaches and strategies are used to answer the criticisms of the process approach. Some approaches, such as genre-based and strategy instruction, are used as supportive alternative strategies to improve the quality of writing and increase student writing performance.

1.2 Genre-based Strategy Instruction

Drawing on Englert et al. (1991), genre-based writing instruction was designed to increase students' expository writing skills using novel text structures. Recognizing the infrastructure of the text types and the knowledge of genre features helps readers find information, record, progress, and locate answers to their questions, as well as support their reading comprehension, note-taking, and summarization (Traga Philippakos & MacArthur, 2021). The primary determinant of the genre is the text's form or surrounding context (Bawarshi & Reiff, 2010). Different types of text have different characteristics in terms of purpose, context, and audience, so the teachers need to emphasize the features of different text types to use them as a guide in planning, developing, and revising processes of writing (Badger & White, 2000; Derewianka & Jones, 2016). The genre-oriented teaching enables students to understand how texts are explicitly structured to achieve particular purposes, which is necessary for metalinguistic awareness (Hyland 2018). The genre-driven approach also appeared to teach writing that requires teaching students explicitly the features of various genres such as narrative, nonfiction, and poetry (Donovan & Smolkin, 2006). The instruction includes the elements of narrative, expository, persuasive, or research writing and the use of graphic organizers for planning and organizing ideas (Dean, 2010; McCarthy, 2008). Addressing instruction on text structure means introducing expository texts are informational texts that provide definitions, information, and explanation about a subject and are often characterized by factual information, headings, and subheadings. Unlike expository texts, argumentative texts seek to persuade readers by establishing a discussion and defending a point of view (Derewianka & Jones, 2016; Ferretti & Graham, 2019).

Strategy instruction is based on the systematic instruction of writing processes (MacArthur, 2011), metacognitive strategies for self-regulation (Harris & Graham, 2009) and teaching students to use specific techniques to plan, monitor, evaluate, and revise their texts (Graham et al., 2012). Systematic and explicit instruction of writing processes across genres helps students critically identify genre elements and use them to transfer knowledge across reading and writing (Philippakos & MacArthur, 2020). Corden's (2007) study revealed that explicit instruction of literary devices improves the quality of children's narrative writing. Rietdijk et al. (2017) adopted writing strategy instruction for genre-specific strategies. The strategies were taught implicitly through teacher modeling and allowing students to reflect on their writing process at the end of each unit. The comprehensive writing program was found to be effective in improving the writing performance of the students in the upper grades of primary schools.

1.3 Assessing Writing

The effect of writing instruction in primary grades varies by the nature of writing instruction (Kim et al., 2021). Studies have also revealed that the assessment positively affected the quality of writing (Graham & Sandmel, 2011). Assessing student writing in second–sixth-graders quite varies. These assessment strategies include teacher feedback, peer feedback, and student self-assessment, which use rubrics to evaluate their writing (Guastello, 2001). Meta-analysis results reported by Graham et al. (2012) and Koster et al. (2015) indicated that feedback and peer interaction could improve the quality of writing. In addition, teaching young students how to revise has a powerful impact on improving their writing (Graham, 2006a). Teaching approaches that include strategies for consulting and responding to children's literacy learning improve their learner activities by valuing their ideas as writers (Edwards & Jones, 2018). Boon (2016) used several strategies to increase children's uptake of feedback during peer assessment in primary school writing. If students receive task-based feedback, sufficient time to discuss their texts with their peers, and the opportunity to reflect on the process of revising, they better use the feedback to improve the quality of work being evaluated.

Periodically receiving feedback on their progress, children performed better in learning and using strategy effectively, writing paragraphs, and working productively (Schunk & Swartz, 1993). First-grade students also

revised their writing content and writing conventions in response to 90% of the feedback they received from their peers and teacher (Peterson & Portier, 2014). Performance feedback, which requires detailed, specific, and explicit feedback, was specifically used to improve students' writing fluency skills (Eckert et al., 2006; Truckenmiller et al., 2014). In the revising and rewriting stage of different genres, such as descriptive, instructive, explanatory, argumentative, and narrative texts, paying attention to the feedback of reader(s) and observing them while evaluating their texts improve the communicative effectiveness of the texts (Rietdijk et al. 2017). In another study, the writing success of second-and fourth-grade students in a cross-age tutoring writing program was assessed through written responses and group discussions. Although the results of second-grade students were not statistically different from the non-treatment group, there was a statistically significant academic difference in the writing performance of fourth-grade students, according to the 6+1 traits writing assessment rubric (Paquette, 2009). Furthermore, experiences with narrative and informational texts during the early years of schooling are necessary because it provides a foundation for students who will need success in the upper grades as information text structure is the primary literary format in content areas (Heider, 2009; Moss, 2004).

Given this theoretical and empirical background to the problem, this research was guided by the following questions:

- Is there a significant effect of genre-specific strategy instruction as part of the revision process in developing the fourth-grade students writing performance on the development of text structure and content of different genres (opinion /expository /argumentative texts)?
- Is there any effect of gender on students' writing performance on the development of text structure and content of different genres (opinion /expository /argumentative texts)?
- Is there any effect of genre on students' writing performance on the development of text structure and content?

2. Method

This study aimed to examine the effect of genre-specific strategy and evaluation within the scope of revision and feedback on the development of text structure and content of different genres, including opinion, expository and argumentative writing of fourth-grade students. It was also examined whether the effect differed according to the genre and gender of the students. A quantitative research method was used in the study. This study was conducted with a single group, and individuals were not randomly assigned. A single group pretest-posttest design was used, and this pattern was named pre-experimental (Creswell, 2014).

2.1 Participants

The study was conducted in a public school in the central district of Antalya, Turkey, where children with middle socioeconomic status. The participants were in the fourth grade; however, the students were engaged in nonfiction and narrative writing in the second-and-third grade. In second grade, they wrote "How-to-books" as a part of procedural writing, persuasive letters, and speeches as a part of opinion writing and information books. In the third grade, they wrote informational writing about science and persuasive reviews about books. Finally, in the fourth grade, the students engaged in writing opinion essays, informational writing building on expository structure, and persuasive essays building on argumentative structures. Thus, the data included the opinion, expository and argumentative essays of fourth-grade students who received process-based writing education in previous years. There were 30 participants (13 male and 17 female). Table 1 shows the text types and participants' genders.

Table 1: The type of text and the gender of participants

Genre	Participants' gender		
	Male	Female	Total
Opinion text	6	16	22
Expository text	9	16	25
Argumentative text	13	17	30
Opinion + expository + argumentative	4	15	19

2.2 Data Collection

Process-based teaching writing was taken as a basis, and all the steps required by this approach were implemented. The basic principles of Calkins's writing workshops have been mainly followed. For each type of text writing, one to 1.5 months are allocated. Also, two to three hours were given for the implementation each week. Before each different writing exercise, the students' previous experiences with informative and persuasive essays were reminded, and a discussion was made on the genre through a sample text. The students first developed several ideas/topics at the beginning of each writing type. For instance, they were asked to create an essay entry chart for opinion writing. In one column, they were asked to write what they noticed. Then, they wrote what made them think in the other column and added examples. They used a graphic organizer with boxes and bullets to frame the essays for informational writing. When they started generating ideas, they were expected to choose a topic and develop texts that applied to the characteristics and genre structure. When they chose their topic, they used genre structure to improve their drafts. The selected drafts were reviewed by both peers and the teacher using genre-specific evaluation criteria for both structure and the content of the drafts.

2.3 Data Analysis

The drafts and final written products were evaluated using rubrics for each genre. The opinion texts were assessed under the following nine categories: (1) introduction/observation, (2) thesis statement, (3) topic sentence I, (4) supporting information I, (5) topic sentence II, (6) supporting information II, (7) topic sentence III, (8) supporting information III and (9) conclusion. The expository texts were evaluated under the following ten categories: (1) purpose, (2) title, (3) main idea/topic, (4) introduction, (5) facts, (6) subtitles/categories, (7) sequence, (8) conclusion, (9) text features (pictures, graphics, etc.) and (10) language. The argumentative texts were evaluated under the following 11 categories: (1) data introduction, (2) claim, (3) supporting evidence I, (4) elaboration of evidence I, (5) supporting evidence II, (6) elaboration of evidence II, (7) counterargument, (8) supporting evidence, (9) elaboration of evidence, (10) rebuttals, and (11) conclusion. For each category, a four-point performance task writing rubric was used to score the texts. Expectations were clearly explained under each scale. According to this rubric, level 0 refers to fail meeting criteria, level 1 refers to unsatisfactory, level 2 refers to below expectations, level 3 refers to meeting expectations, and level 4 refers to exceeding expectations. A total of 154 texts were evaluated for this study. For at least 10 participants, each text, for consistency, was assessed by two different researchers. The consistency ($r_s = .85$ to $.95$; $p < .01$) of the researchers' evaluation scores was found to be sufficient for reliability. First, the data were analyzed to examine the students' achievement scores and whether they were distributed normally. The Shapiro-Wilk normality test results revealed that the difference in pretest and posttest scores of the data for each genre (opinion, expository, and argumentative) distributed normally ($.098$; $.281$ and $.138$ $p > .05$). Thus, a paired-sample t-test was used to examine the difference between students' draft scores and final writing scores. The data for the structure categories of each genre were not normally distributed ($.00$ $p > .05$) so the Wilcoxon (paired) signed-rank test was used to compare the mean scores of the students in each category. To test the significant differences between the groups' pretest and posttest scores of different texts, one-way repeated measures ANOVA was used. Each group should have an equal number of scores for this type of analysis, so only 19 participants who wrote in all three types were included. To look at the difference between the pretests and posttests of three different text types, the texts were divided into the following three basic parts: introduction, body, and conclusion.

As the categories for each type differ, the scores for the body part of the expository and argumentative texts were re-evaluated to convert the scales into the same form. Then, the normality test was performed. It has been observed that the introduction posttest, and conclusion pre- and posttest scores did not show a normal distribution, and the W (19) value varied between $.53$ and $.93$ ($p < .05$). Therefore, the Friedman test, a non-parametric version of a repeated-measures ANOVA, was used to compare the means of introduction posttest, conclusion pre-, and posttest scores.

An ANOVA was used to compare the means of introduction pretest and body pre and posttest. In examining the effect of genre on success, the significance of Mauchly's test of Sphericity is checked for the introduction pre-test scores ($p = .919$, $p > .05$); body part pre-test scores ($p = .158$, $p > .05$) and body part post-test scores ($p = .137$, $p > .05$). The sphericity requirement was met, so no correction to the F-value was required to examine.

3. Results

A significant difference was found between three different text types pre- and post-test results. Using genre-specific strategy and evaluation as a part of revision has a significant effect on the total achievement of students in writing opinion [$t(21)=-5.30$, $p < 0.01$], expository [$t(24)=-8.58$, $p < 0.01$] and argumentative texts [$t(29)=-6.17$, $p < 0.01$] (Table 2). The student participation in writing workshops increased.

Table 2: T-test Results of Opinion, Expository, and Argumentative Texts

Factors	N	X	Sd	df	t	p
Opinion draft	22	12.45	6.29	21	-5.301	.000*
Opinion final	22	19.31	7.87			
Expository draft	25	20.24	6.46	24	-8.58	.000*
Expository final	25	27.16	5.76			
Argumentative draft	30	17.73	6.08	29	-6.17	.000*
Argumentative final	30	22.73	6.86			

$p < .01$

When we look at the increase in the mean scores of each type of text, the most increase has been observed in the opinion texts, and the least increase has been observed in the argumentative texts. The students were also better at writing expository text than the other ones (Figure 1).

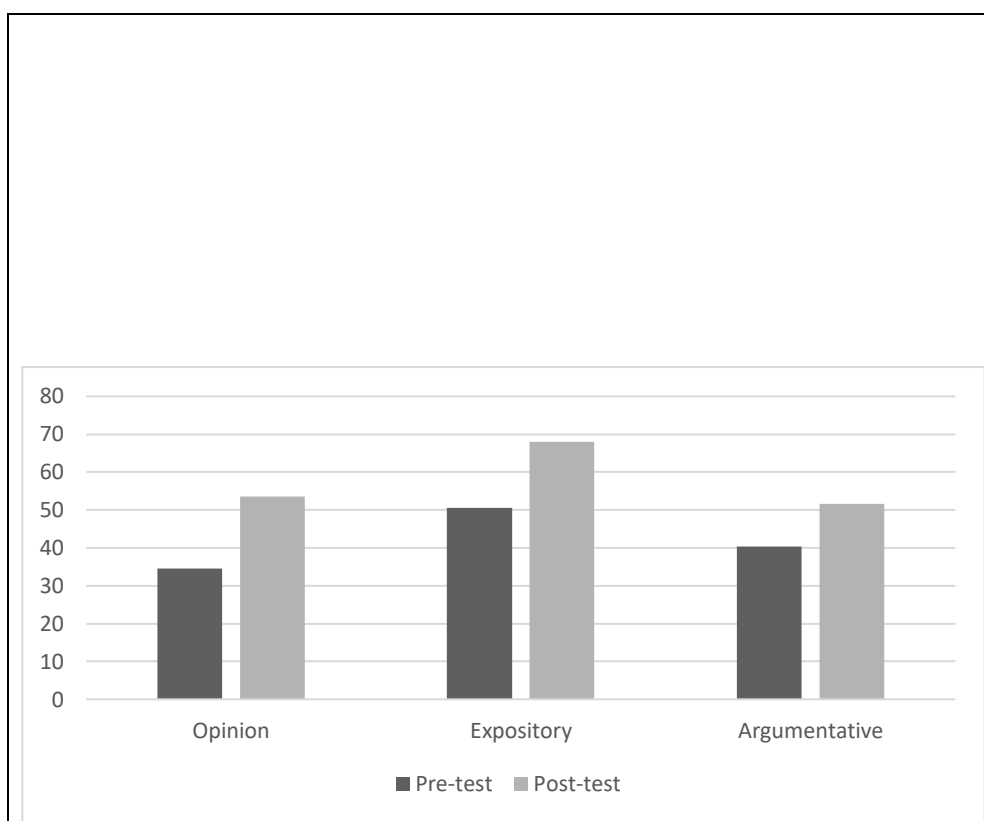


Figure 1: Percentage of Pretest and Posttest means of the Participants

3.1 The Development of Text Structure and Content

3.1.1 Opinion Texts

The structure and content of the opinion texts were evaluated under the following nine categories: introduction/observation, thesis statement, topic sentence I, supporting information I, topic sentence II, supporting information II, topic sentence III, supporting information III and conclusion. In the categories of opinion, writing

students' success were increased in writing a thesis statement ($Z=-2.948$, $p<.01$, $r=.24$) first paragraph topic sentence ($Z=-2.754$, $p<.01$, $r=.58$) and supporting information ($Z=-2.798$, $p<.01$, $r=.59$) and conclusion ($Z=-2.754$, $p<.01$, $r=.58$). They did not have statistically significant achievement in writing the introduction ($Z=-1.134$, $p<.01$, $r=.24$), topic sentence ($Z=-2.304$, $p<.01$, $r=.49$), supporting information for the second paragraph ($Z=-2.321$, $p<.01$, $r=.49$), writing either third paragraph topic sentence ($Z=-1.876$, $p<.01$, $r=.40$), and supporting information ($Z=-2.392$, $p<.01$, $r=.51$).

Also, the introduction paragraphs' draft and final mean scores of the student were higher than those of other categories (Figure 2). They were already successful in writing an introduction paragraph based on their observations. Compared to the students' mean scores in each category, writing a thesis statement has the highest scores after revising. Students were also better at developing the first paragraph to support a thesis statement.

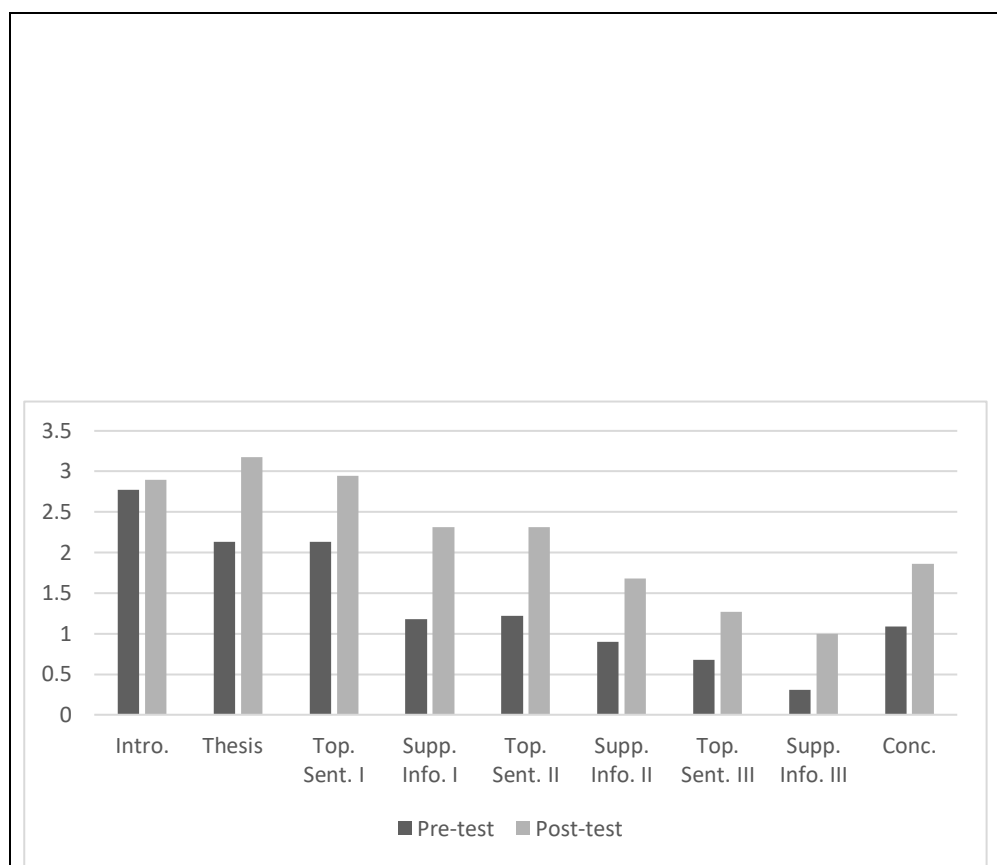


Figure 2: Percentage of Pretest and Posttest Means of the Opinion Text Structure

3.1.2 Expository Texts

The structure and content of opinion texts were evaluated under the following 10 categories: purpose, title, main idea/topic, introduction, facts, subtitles/categories, sequence, conclusion, text features (pictures, graphics, etc.), and language. There was a significant difference between the draft and final paper scores in the categories of the main idea/topic ($Z=-3.900$, $p<.01$, $r=.78$), introduction ($Z=-4.300$, $p<.01$, $r=0.86$), facts ($Z=-3.879$, $p<.01$, $r=0.77$), subtitles/categories ($Z=-3.704$, $p<.01$, $r=0.74$), sequence ($Z=-3.666$, $p<.01$, $r=.73$), conclusion ($Z=-2.801$, $p<.01$, $r=.56$), text features (pictures, graphics, etc.) ($Z=-3.169$, $p<.01$, $r=.63$) and language ($Z=-4.021$, $p<.01$, $r=.80$) except purpose ($Z=-1.342$, $p<.01$, $r=.26$) and title ($Z=-2.232$, $p<.01$, $r=.44$) categories of the texts.

Although there was a significant difference in the scores for the conclusion and text feature categories, the mean scores of these categories were relatively low compared to other categories (Figure 3).

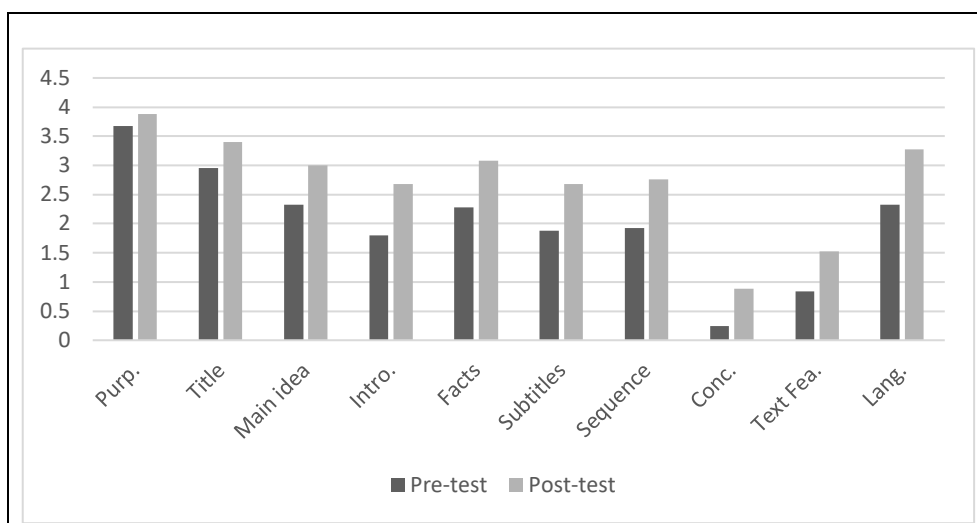


Figure 3: Percentage of Pretest and Posttest Means of the Expository Text Structure

3.1.3 Argumentative Texts

The argumentative texts were evaluated under the following 11 categories: data introduction, claim, supporting evidence I, elaboration of evidence I, supporting evidence II, elaboration of evidence II, counterargument, supporting evidence, elaboration of evidence, rebuttals, and conclusion. A significant difference has been observed in the pre-test and post-test of the scores for data introduction ($Z=-2.889$, $p<.01$, $r=.52$), claim ($Z=-2.640$, $p<.01$, $r=.48$), elaboration of second evidence ($Z=-2.682$, $p<.01$, $r=.48$), writing rebuttals ($Z=-3.207$, $p<.01$, $r=.58$) and conclusion ($Z=-3.391$, $p<.01$, $r=.61$). The results of the other categories respectively; first supporting evidence ($Z=-1.633$, $p<.01$, $r=.29$) and its elaboration ($Z=-1.741$, $p<.01$, $r=.31$), second supporting evidence ($Z=-2.145$, $p<.01$, $r=.39$), developing counterargument ($Z=-2.195$, $p<.01$, $r=.40$) and supporting evidence for counterargument ($Z=-1.508$, $p<.01$, $r=.27$) and elaboration of this evidence ($Z=-2.145$, $p<.01$, $r=.39$) showed no significant difference between the draft and final writing achievement scores of the students.

The mean scores of the students in elaborating evidence for supporting evidence of the claim are relatively low compared to the other categories. They were better at writing claims and supporting evidence (Figure 4).

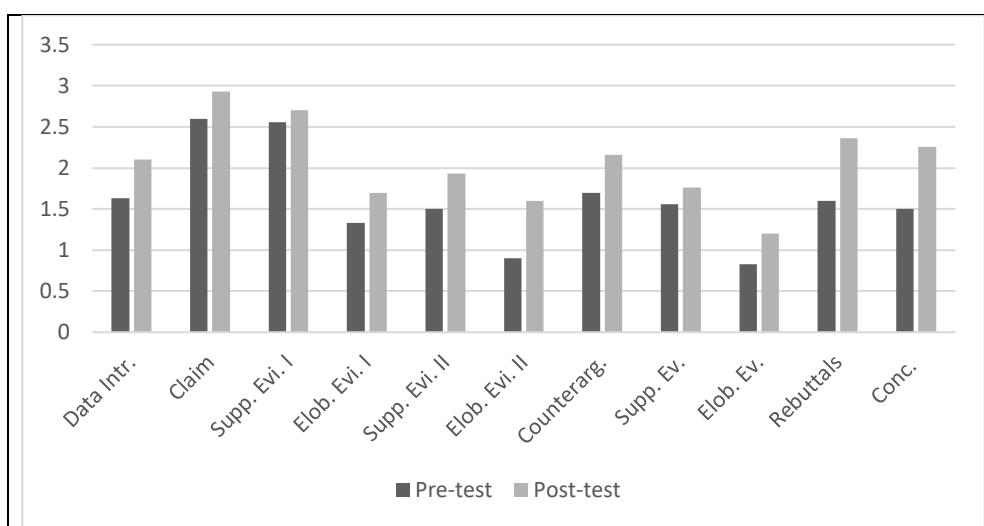


Figure 4: The Percentage of Pretest and Posttest Means of the Argumentative Text Structure

3.2 Gender Difference

No significant difference has been observed between male and female students' draft and final writing scores of different texts (Table 3).

Table 3: T-Test Results of Gender Difference in Genre Writing

Factors	Group	N	X	Sd	df	t	p
Opinion draft	Male	6	9.00	2.19	20	-1.63	.11
	Female	16	13.75	6.87			
Opinion final	Male	6	21.16	7.57	20	.666	.51
	Female	16	18.62	8.10			
Expository draft	Male	9	20.00	6.28	23	-0.13	.89
	Female	16	20.37	6.77			
Expository final	Male	9	26.66	3.39	23	-0.31	.75
	Female	16	27.43	6.84			
Argumentative draft	Male	13	15.38	6.71	28	-1.93	.06
	Female	17	19.52	5.03			
Argumentative final	Male	13	19.84	6.13	28	-2.13	.04
	Female	17	24.94	6.72			

$p < .01$

Although there was no significant difference between opinion text scores based on gender, male students' average scores exceeded that of female students for the first time (Figure 5).

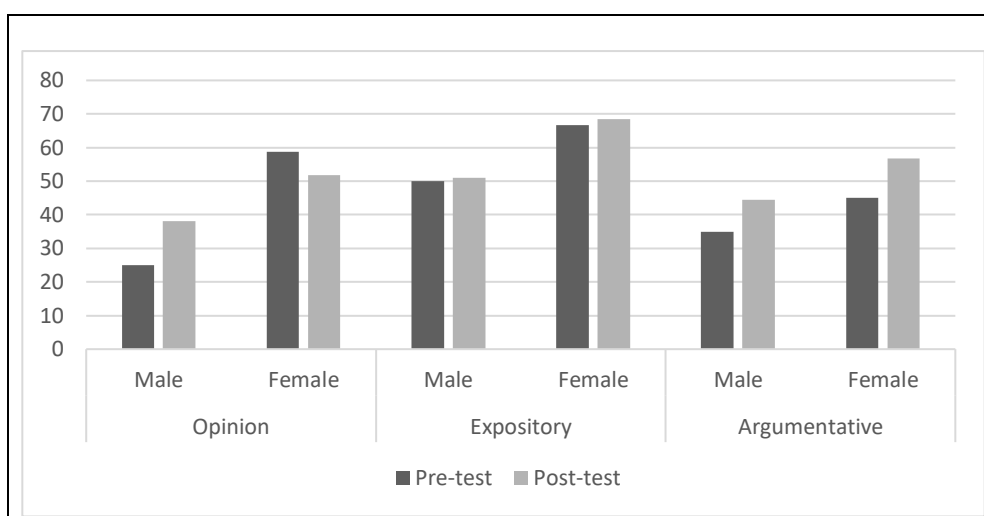


Figure 5: Percentage of Males' and Females' Pretest and Posttest Scores of Different Genres

3.3 The Effect of Genre

Figure 6 depicts the development of the main parts: introduction, body, and conclusion. According to the figure, students increased their scores in an opinion text body, expository text introduction, and argumentative text conclusion (19% - 20%). The increase in the scores of opinion text introduction and conclusion and expository text body and conclusion varied between 15% and 17%. Argumentative text introduction and body scores have the least increasing rates (10% - 11%). The participants were good at writing an introduction compared to the other parts. In the development of the body paragraphs, it appears that students were better at expository texts. In their final paper, they developed body paragraphs of opinion texts in their final forms. The conclusion part of the expository texts had the lowest scores.

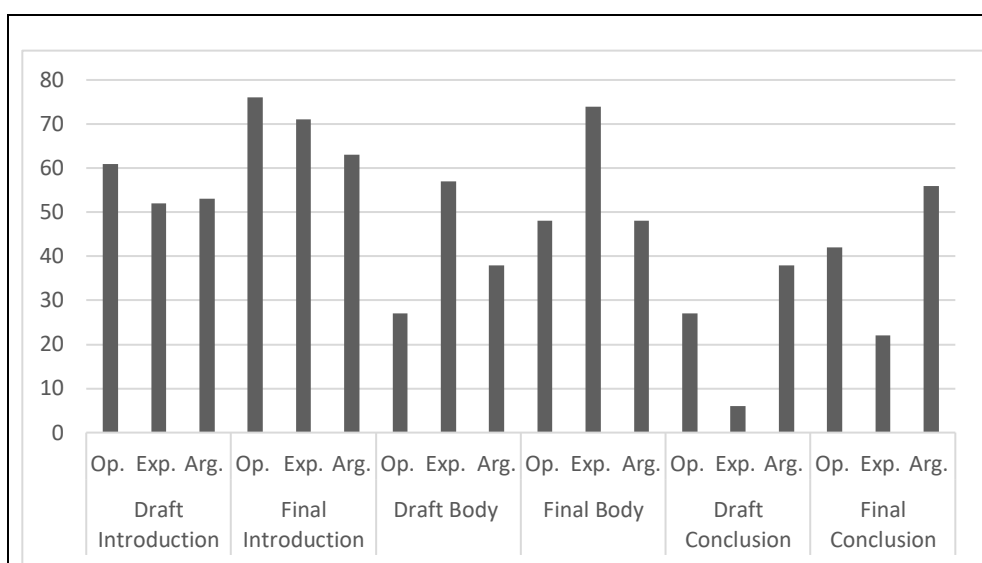


Figure 6: Percentage of Pretest and Posttest Means of the Main Parts of Each Text

The ANOVA and Friedman test results revealed no significant difference ($F=.96$, $df=2$, $p=.013$, $\eta^2=.03$) between the introduction pretest scores of opinion and expository and argumentative texts. Also, there was a significant difference ($\chi^2=6.31$, $p=.043$) between the introduction posttest scores of opinion texts (median =7), expository texts (median =6), and argumentative texts (median =5). The difference occurred between the means of opinion texts and argumentative texts. The development of the introduction of opinion texts was significantly higher than the argumentative essays. The body part of each writing pretest score varied significantly depending on whether the task was opinion, expository, or argumentative ($F=13.4$, $df=2$, $p=.001$, $\eta^2=.30$). Also, a significant difference has been observed between opinion and expository texts; the success rate was 30% due to the genre. A comparison of the mean number of pre-texts completed by participants showed that students performed reasonably well in expository writing ($\bar{x}=13.97$, $S=1.04$) and argumentative writing ($\bar{x}=10.34$, $S=1.04$). However, their performance in writing body parts was considerably low in writing opinion texts ($\bar{x}=6.95$, $S=1.04$). There was also a significant difference between the posttest scores of the body parts ($F=12.6$, $df=2$, $p=.001$, $\eta^2=.24$). The difference occurred between the expository texts ($\bar{x}=18$, $S=1.16$) and other genres, which are opinion texts ($\bar{x}=11.7$, $S=1.16$) and argumentative texts ($\bar{x}=12.6$, $S=1.16$). There was a significant difference ($\chi^2=18.3$, $p=.001$) between the conclusion pre-tests scores of opinion texts (median =1), expository texts (median =0), and argumentative texts (median =1). The difference occurred between the means of expository texts and the other genres. The performance for writing a conclusion for expository texts is considerably low compared to other genres. A significant difference ($\chi^2=9.93$, $p=.007$) has been observed between the conclusion posttest scores of opinion texts (median =2), expository texts (median =1), and argumentative texts (median =2). The difference occurred between the means of expository post-texts and argumentative posttests.

4. Discussion

Despite the limitations, such as sample size and lack of a control group, the results of the present study should be interpreted with the knowledge of two issues. One is the students who were familiar with this process from the second grade, and the other is the nature of the study that is a part of a long-term study that aims to apply the process approach -writing workshop- in the Turkish context. This study offers evidence-based instruction for elementary teachers to teach writing with the adaptation process of the national curriculum.

Using strategy instruction and a genre-specific approach as part of the revision and feedback have been found to be effective in improving the quality of students' narratives. This study focused on writing different types of texts and explicitly teaching fourth-grade students the characteristics of genres such as opinion, expository and argumentative texts. Although there is a significant difference between the total scores in each text type, no difference has been observed between girls and boys regarding writing performance. Although there was the highest increase in opinion text, the highest mean scores were in expository text type. The study results are consistent with predictions from other studies that provide additional empirical support for the positive link

between using explicit strategy instruction, and teaching genre-specific elements for planning, revising, and writing quality. The findings of three recent meta-analyses provide further support for the positive effect of text structure instruction (Graham et al., 2012; Kansizoglu & Bayrak Comert, 2017; Koster et al., 2015). They reported average weighted effect sizes for explicit strategy and text structure instruction ranging from .59 to 1.15, respectively. Graham et al. (2012) examined the effect of writing instruction practices applied to primary school students (first-second graders), and they identified strategy instruction, self-regulation attached strategy instruction, text structure instruction, peer-support, writing evaluation, process-based approach, and comprehensive writing programs as seven interventions of 13 effective writing practices.

Graham and Perin (2007) evaluated the effectiveness of writing instruction methods used in the 4th – 12th grades and reported process-based writing approach, teaching strategy, and peer support as effective methods within 11 dimensions. Koster et al. (2015) examined 32 studies using meta-analysis to determine effective instructional writing practices for fourth and sixth graders. Among the ten goal-setting dimensions, strategy instruction, instruction of text structures, peer support, and feedback were the most effective intervention for students' writing achievements. Kansizoglu and Bayrak Comert (2017) conducted a meta-analysis study to identify the level at which the "writing as a process" approach affects students' writing success. The results of 21 experimental/ quasi-experimental studies conducted in Turkey that meet the criteria for inclusion have been synthesized. According to the meta-analysis results, using a planned writing and evaluation model has the highest effect on students' writing achievements.

These findings also support the results explicitly indicating that teaching student to use genre or task-specific strategies have positively affected writing quality and students' achievement. Olinghouse et al. (2015) found that both the discourse and topic knowledge of fifth-grade students contributed to the quality of writing and the number of genre-specific elements included in writing stories, persuasive papers, and informational texts. These results reveal that students' knowledge about writing can affect the quality of writing even though developing writers may have limited skills.

Ferretti and Lewis (2018) examined the effects of writing goals and knowledge of the persuasion genre on the quality of argumentative writing. Their analyses showed that genre-specific writing goals and knowledge of persuasion predicted the quality rate of writing (Gillespie et al., 2013; Olinghouse & Graham, 2009; Olinghouse et al., 2015). Although writing argumentative essays is challenging for young learners, Philippakos et al. (2018) designed research to develop an intervention based on strategy instruction and used genre elements to guide planning and evaluation for revision. Pretest–posttest comparisons showed improvements in quality in genre elements.

In this study, each text has been evaluated in different categories regarding structure and content. A problem with focusing on the last parts of the opinion and argumentative texts and improving their content has been observed. While this is the third paragraph that supports the thesis statement in opinion articles, it has become the conclusion part of the expository text. In argumentative texts, it was challenging to develop each paragraph.

Finalizing the writing activity in each text type and making it ready for printing/sharing with the reader has increased over time, and 19 students have completed their writing activities in each text type. However, considering the average persuasiveness of students in opinion and argumentative writing, it would be safe to say that it was not well developed. Students failed to provide support for the second and third paragraphs, including topic sentences and supporting information. It is also evident in argumentative essays.

Subsequently, no statistically significant improvement has been observed in most of the elements of the text's developing part. It is also interesting to add that students were successful in the introduction paragraphs of both the opinion and expository text drafts, which are not an issue for argumentative texts. Having a good introduction is an indicator of developing the text more successfully. However, as students focus on the introduction in revising, they poorly develop other genre-specific elements. These results are also consistent with the results of other studies.

Students who received a detailed goal focusing instruction on the inclusion of genre-specific discourse elements positively affected the quality of students' written arguments resulting in writing more persuasively than those who received a general writing goal. Few students considered the alternative perspective (Ferretti et al., 2009). A significant minority of these students (43%) could not state that persuasion involves convincing another person (Ferretti & Lewis, 2019). My-side bias is common in students' persuasive writing (Ferretti & Fan, 2016).

According to Beyreli and Konuk (2018) study, students' ability to create persuasive texts was improved through education. At the end of the education, counter opinions, source, elaboration are the three categories between six categories that did not reach "very good" level out of an of 17 categories in total. The failure to address counterview, inadequate resource use, and elaboration techniques were explained as it might be because of insufficient development of critical and abstract thinking and a lack of the students' research culture. Persuasive writing that includes opinion and argumentative writing is challenging for young and emerging writers as it requires both social considerations like convincing a reader and cognitive processes such as planning and revising (Philippakos, 2017). Also, students in elementary grades know more about stories than persuasive and informational texts (Gillespie et al., 2013). Written argumentation is also insensitive to alternative perspectives and is often of poor quality compared to other genres. Students who provide strong reasons with supporting examples often fail to provide alternative views in their written arguments (Ferretti & Graham, 2019). When developing counterarguments for convincing the reader, children at an early age have difficulty choosing persuasive reasons and taking the perspective of others (Golder & Coirier, 1994). Although there was a difference in the mean scores of males and females, the results were not statistically significant. The study results did not support the superiority of females over males in writing and writing knowledge (Gelati, 2011). Also, it supports the results of Gillespie et al.'s (2013) research. Their study examined the relationship between the characteristics of writing types and knowledge about the writing process. They also controlled writing achievement and gender as they might affect knowledge about the writing process. Gender and writing achievement were not controlled for statistically significant. The genre explains approximately 30% of the success. Although the improvement in opinion text is higher than in expository and argumentative texts, students are better at writing expository texts than other types of argumentative and opinion texts, respectively. Also, the study results challenge the meta-analysis findings of Kansizoglu and Bayrak Comert (2017), indicating that effect sizes do not differ significantly depending on the text type (informative, narrative, and free) used in process-based writing instruction. When looking at the texts as an introduction, body, and conclusion, students were good at the introduction but showed more improvement in opinion texts. The students performed reasonably well developing the body paragraphs on expository writing and argumentative writing but low in writing opinion texts. However, the performance for writing a conclusion for expository texts is considerably low compared to other genres.

5. Conclusion

Although the size of the sample is one of the limitations of this study, the background of the students who were introduced to process-based writing at the beginning of the second grade and were exposed to different types of writing experiences made this study stronger than the studies that examined the effect of different writing strategies with the students for a very limited time. Stories and informational genres have received the most attention in writing research and classrooms (Donovan & Smolkin, 2006). Compared to other genres, such as stories, exposure to persuasive text may be limited. Furthermore, most research was conducted on writing strategies, and less research focused on planning and revising strategies (Harris et al., 2013). The results of this study contributed to the body of knowledge in the areas that require more attention than others. The quality of composing is determined by how many and how well genre elements are used within a text (Graham et al., 2011). The characteristics of the genre-specific elements of different texts overlap. Also, they have several unique features specific to that genre. Improving the quality of the essay depends on deciding the central genre elements and enhancing the quality of these features. In this study, fourth-grade students had strategy instruction for explicit guidance on the structure of the genre, including topic, audience, purpose, and form of the text.

Genre-based strategy instruction included students using organizers to plan for considering the elements of the specific genre. They also applied genre-specific criteria derived from these elements to evaluate and revise their draft texts with teachers and peers. Process-based writing and genre-specific strategy instruction affected the writing achievement of primary school students. For academic growth and increasing students' writing and

interdependence skills, evidence-based writing practices should be implemented and begin from the beginning of schooling.

Teaching approaches that include strategies for consulting and responding to children's literacy learning develop their learner activities by valuing their ideas as writers (Edwards & Jones, 2018). Students who are also assigned as a reviewer for reading, rating and suggesting the persuasive essays of their peers wrote better quality final essays than both control groups that one of them only reads the texts and the other read the narratives to control time and effort (Philippakos & MacArthur, 2016). According to the study results, specific genre knowledge also enriches students' feedback on each other's writing, resulting in improvement in writing quality (Hoogeveen & van Gelderen, 2015). The need for teaching more about the elements of common writing genres in elementary grades became apparent as a result of this study. The earliest they were introduced to different genres and the most knowledgeable and proficient writers they became. Teachers need more writing activities to discuss genre-specific features and learn more strategies for planning, developing and revising their writing pieces. This is necessary for students to learn the production process of informative texts, including expository, persuasive, and argumentative texts. This study shows that developing an argument based on an opinion or a claim is more complicated than giving information on a topic. In addition, the beginning of the essay is more focused on development compared to the body of the text. Therefore, it is crucial to spend more time writing persuasive essays in early grades and focus on every element of the genre structure.

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Analysis of Music Teachers' Attitudes Toward Music Software

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Abstract

Technological innovations cause significant changes in educational environments as in all areas of life. Thanks to software, the locomotive of digitalization, innovations are experienced in many branches, from teaching materials to the teaching environment. Software products have influenced every stage of music, from production to distribution. This study aims to determine the level of music teachers' attitudes toward music software, which is one of the most important reflections of technological advances in music. The survey design was used as the research method. Attitude Scale towards Music Software was used as a data collection tool. The online scale was sent to 416 music teachers in the Ankara-Çankaya region in the 2021-2022 academic year. According to the research findings, music teachers' attitudes toward music software are reasonable. While teachers' attitudes towards music software show a significant difference according to their gender, professional seniority, and the type of school they work in, there is no significant difference according to their undergraduate program.

Keywords: Music Education, Music Programs, Instructional Technology

1. Introduction

With economic and technological advances, digitalization has become indispensable in today's world (Jeremić et al., 2020). With the computer, web, internet, mobile devices, cloud technology, and software industry, disruptive shifts are affecting every aspect of life (Amershi et al., 2019). From daily life routines to health, from agriculture to space technologies, these innovations are seen wherever human beings need them.

Technological innovations are also causing significant changes in the field of education. Societies that want to best prepare their future generations are looking for better ways of teaching and learning. This change accelerated, especially with the prevalent use of personal computers and the emergence of the internet. The change that started with specialized teaching materials has progressed to the change in learning environments. Learning types and approaches such as computer-assisted, electronic, mobile, web-based, blended, and flipped classroom have started to be used. Technology-supported learning applications yield positive results in academic achievement, motivation, and attitude (Harandi, 2015; Jeno et al., 2019; Korkmaz & Kadirhan, 2020). With the learning environment realized this way, learners' high-level thinking skills are contributed (Lee & Choi, 2017). In addition, it can be said that renewal in education is a necessity for raising new generations of so-called digital natives (Prensky, 2001).

Classical teaching methods are being renewed using technological opportunities in music education and other fields (Ye Yang, 2020). For example, the use of technology in popular music education has become indispensable (J. C. W. Chen, 2020). Music education, which is seen as one of the most challenging disciplines to teach (Mabini, 2022), has facilitated developments due to technology. This situation can be further diversified with software produced for music and general software used in education.

When the basic features of music software are considered, they can be generally classified as follows: Educational software for theory, history, hearing, instrument, and voice education; production-oriented software such as music creation, editing, and notation; auxiliary software such as tuning, metronome, sound recording; music listening and sharing software. Considering the applications produced for mobile devices today along with computer programs, the number and variety of music software is increasing considerably. Many programs and applications can be used for multiple purposes. For example, so-called Digital Audio Workstations (DAWs) are very comprehensive music production tools. DAW software can be used to record an extensive musical work, produce sounds, write notes or use it for tuning and metronome purposes. This diversity also increases the places of use. From amateur musicians to professionals, from preschool music classes to PhD-level students, everyone interested in music uses music software at the level of their needs. The number of music applications in mobile app markets alone is in the thousands. This data shows that music software is functional and useful, so the demand for it is increasing.

Watson (2011) states that the variety of materials used in music classrooms is more significant than ever in history. The main reason for this statement is natural technological advances. Apart from general educational technology tools, music software can be used as teaching aids for all levels. Frankel (2022) stated that production-oriented software such as DAW and notation are essential for developing the musical creativity of middle school students. In their study, Gower and McDowall (2012) found that interactive music video games attracted children's attention and could contribute to musical knowledge and skills development. Juntunen et al. (2013) made faster progress in instrument training supported by notation programs. Debevc et al. (2020) conducted a study with students in the 9-11 age group and concluded that those who worked with mobile applications were more successful in musical intervals and rhythmic accuracy. Chen (2020) found that the use of DAW in composition studies increased students' motivation.

Scientific studies on the use of music software as educational materials are increasing. The most crucial point is that music teachers should follow current technological advances and apply them in their classrooms. Teachers are expected to have a positive attitude towards music software. İnCEOğlu (2010) explained attitude as follows: a mental, emotional and behavioral reaction that an individual organizes based on his/her experience, knowledge, feelings, and motives towards himself/herself or any object, social issue, or event in his/her environment. There is a significant positive relationship between achievement and attitude (Hussain et al., 2016). Individuals who are successful in a subject also have a positive attitude toward that subject (X. Chen, 2022).

1.1 Purpose

This study aims to determine the level of music teachers' attitudes toward music software. Depending on the purpose of the research, answers to the following questions were sought:

1. What is the level of music teachers' attitude towards music software?
2. Do attitudes towards music software vary according to gender, professional seniority, school type, and graduated school type?

2. Method

2.1 Study Design

A survey was used in this research. "A survey is a study of lots of cases from the same category" (Newsome, 2016, p. 410). Surveys collect information about people's attitudes, values, beliefs, opinions, motivations, incentives, past behaviors, intended behaviors, and demographic characteristics (Newsome, 2016; O'Leary, 2017).

2.2 Participant

The research was conducted with music teachers working in schools in Ankara-Çankaya in the 2021-2022 academic year. According to Ankara Provincial Directorate of National Education data, the distribution of music teachers in Çankaya is given below.

Table 1: Music teachers in Ankara-Çankaya

	Group	f	%
Gender	Female	265	63.7
	Male	151	36.3
School Type	Public	186	44.7
	Private	230	55.3
Total		416	100

As seen above, most teachers working in Ankara-Çankaya work in private schools. The majority of music teachers are women. Sampling was not done in the study, and all teachers were tried to be reached. The distribution of the music teachers who responded to the online questionnaire form and formed the study group is shown below.

Table 2: The demographic characteristics of the participants

	Group	f	%
Gender	Female	64	62.1
	Male	39	37.9
Professional seniority	1-5	38	36.8
	6-10	42	40.8
	11-20	23	22.4
School Type	Public	40	38.8
	Private	63	61.2
Graduated	Music Education	65	63.1
	Other	38	36.9
Total		103	100

Table 2 shows the distribution of the participants. Most music teachers who responded to the online survey were women (62.1%). The majority of the participants work in private schools (61.2%). This data seems to be consistent with the data of music teachers working in Çankaya. The participation rate in the survey was 24.76%.

2.3 Data Collection

The Attitude Toward Music Software Scale developed by Demirtaş ve Özçelik (2020) was used as a data collection tool in the study. The scale includes positive and negative emotion component factors and consists of 17 statements. In order to determine the demographic characteristics of music teachers, a personal information form was prepared and added to the scale. The personal information form and attitude scale were transferred to the online environment. The online questionnaire and an informative letter about the study were sent to the teachers.

Table 3: Reliability statistics

Factor	N of Items	Cronbach's Alpha
Positive emotion	11	,877
Negative emotion	6	,851

The reliability analysis results of the factors measured in this study are given above. According to the results obtained, the reliability of the scale is at a reasonable level (Morgan et al., 2011).

2.3 Data Analysis

The data collected online were transferred to the SPSS 21 program. Items with negative expressions were reverse-coded. Normality control was performed to select statistical tests required to solve the research problem. It is recommended to conduct normality tests separately for each variable group to be analyzed (Kilmen, 2015). For this reason, the results of the Kolmogorov-Smirnov normality test for each variable group are given in Table 4.

Table 4: Normality test results

	Group	F1	F2	General
Gender	Female	.016	.031	.047
	Male	.138	.011	.072
Professional seniority	1-5	.200	.200	.200
	6-10	.017	.000	.007
	11-20	.200	.200	.200
School Type	Public	.176	.003	.074
	Private	.031	.008	.003
Graduated	Music Education	.078	.000	.060
	Other	.200	.078	.200

When the normality test results were examined, it was determined that the data did not show the normal distribution in other variable groups except for the Graduated variable ($p < .05$). In the Graduated variable, the distribution of only one group is not normal. For this reason, skewness and kurtosis values were examined, and it was observed that they were within the (± 1) normal distribution range (George & Mallery, 2019). For this reason, the Independent Samples t-Test was used to analyze the Graduated variable. Mann-Whitney U test was used to analyze other two-group variables, and the Kruskal-Wallis test was used to analyze the professional seniority variable. The effect size (r) of the differences found was calculated by dividing the z value by the square root of the sample size (Field, 2018). The determining effect size was explained according to the criteria of 0.10 low, 0.30 medium, and 0.50 high (Field, 2018, p. 179).

3. Finding

The first sub-problem of the research is as follows: What is the level of music teachers' attitudes toward music software?

Table 5: Scale scores

	N	Minimum	Maximum	Mean	Std. Deviation
F1	103	2.00	5.00	3.97	.63
F2	103	2.00	5.00	3.90	.66
Total	103	2.12	5.00	3.95	.61

The data collected from music teachers with the Attitudes Toward Music Software Scale are presented in Table 5. The overall mean score of the scale was calculated as 3.95. The factor mean of the positive emotional component was 3.97, and the factor mean of the negative emotional component was 3.90. According to these results, music teachers' attitudes toward music software are at a good level.

The second sub-problem of the research is as follows: Do attitudes towards music software vary according to gender, professional seniority, school type, and graduated school type? Analyses for the gender variable are presented below.

Table 6: Mann-Whitney U test for the gender

	Group	N	Mean Rank	Sum of Ranks	\bar{x}	p
F1	Female	64	41.98	2685,50	3.76	.00
	Male	39	68.45	2669,50	4.32	

F2	Female	64	46.00	2944.00	3,74	.01
	Male	39	61.85	2412.00	4,13	
General	Female	64	42.95	2749.00	3.75	.00
	Male	39	66.85	2607.00	4.25	

A substantial difference was found in behalf of the Mann-Whitney U test conducted to determine whether music teachers' attitudes towards music software vary according to gender ($p < 0.05$). Male teachers' attitude scores towards music software are statistically significantly higher than female teachers. This situation is the same in the factors dimension and overall scale. The effect size computed because of the test ($r = 0.38$) shows that this difference is at a moderate level.

Table 7: Kruskal-Wallis test analysis of professional seniority variable

Factor	Professional seniority	N	Mean Rank	df	χ^2	p
F1	1-5	38	62.23	2	24.41	.00
	6-10	42	57.42			
	11-20	23	25.20			
F2	1-5	38	62.00	2	19.69	.00
	6-10	42	55.95			
	11-20	23	28.26			
General	1-5	38	62.97	2	25.07	.00
	6-10	42	55.86			
	11-20	23	25.00			

The table shows the results of the Kruskal-Wallis test to determine whether attitudes toward music software vary according to professional seniority. Subsequently the analysis, a significant distinction was found in each factor ($p < 0.05$). The Mann-Whitney U test was used to determine which groups this difference. Consequently, in the analysis, a statistically clear difference was found between the 11-20 group and the other groups. According to these results, those teaching music for 1-10 years has higher attitudes toward music software than those teaching for more than 11 years.

The analysis results according to the type of school where music teachers work are presented below.

Table 8: Mann-Whitney U test for the school type variable

	Group	N	Mean Rank	Sum of Ranks	\underline{x}	p
F1	Public	40	41.25	1650.00	3.77	.00
	Private	63	58.83	3706.00	4.10	
F2	Public	40	42.64	1705.50	3.71	.01
	Private	63	57.94	3650.50	4.02	
General	Public	40	41.26	1650.50	3.75	.00
	Private	63	58.82	3705.50	4.07	

According to Table 8, music teachers' attitudes towards music software differ significantly according to the type of school they work in ($p < 0.05$). The attitude scores of music teachers working in private schools differ statistically significantly and positively compared to the attitude scores of music teachers working in public schools. This situation is the same for the positive and negative emotion component factors and the scale in broad. The effect size computed as a result of the test ($r = 0.28$) shows that this convincing is at a low.

Table 9: Independent samples t-test results of the graduated variable

	Group	N	\underline{x}	Sd	df	t	p
F1	Music Education	65	3.95	.72	100.97	-.45	.65
	Other Departments	38	4.00	.43			

F2	Music Education	65	3.87	.75	100.62	-.76	.44
	Other Departments	38	3.96	.47			
General	Music Education	65	3.92	.71	100.90	-.60	.55
	Other Departments	38	3.99	.40			

The results of the independent samples t-test to determine whether the attitudes towards music software vary according to the undergraduate major are presented in Table 1. No significant difference was found due to the analysis ($p>0.05$). According to this, it can be said that the attitudes towards music software are similar among music teachers who graduated from the music education department and other music departments.

4. Results and Discussion

In this study, music teachers' attitudes toward music software were examined in terms of different variables. The Attitude Toward Music Software Scale was sent online to 416 music teachers in the Ankara-Çankaya region. The study group consisted of 103 music teachers who contributed by filling out the scale.

The overall mean score of the scale was calculated as 3.95. This result indicates that music teachers' attitudes towards music software are good. Similar results were found in the positive and negative emotion component factors. In like manner, Bannerman & O'Leary (2020) found that attitudes toward music technologies were overwhelmingly positive in their study with preservice music teachers. Wise et al. (2011) found that music teachers used music software intensively in their classrooms. In the same study, it was stated that students showed a high level of participation in the studies conducted with music software, and successful results were obtained. Eyles (2018) stated that music teachers need to receive adequate training in information and communication technologies in tertiary education. When the music teaching undergraduate program in Turkey is examined, it is seen that there is no technology-based course specific to the field of music (Yükseköğretim Kurulu, 2018). Despite this situation, the reason why teachers' attitudes towards music software are at a good level may be that teachers are individually interested in music technologies. Additionally, it is recommended that in-service training situations should be examined in different studies.

A statistically significant difference was found in the comparison analysis according to gender. Male teachers' attitude scores toward music software (4.25) were significantly higher than female teachers (3.75). Doherty (2018) found that men have higher self-efficacy in music technology. Bannerman & O'Leary (2020) stated that men have more experience with music technologies. Marpa (2020) states that men's attitudes toward technology-supported instruction are higher than women's. In the studies on mobile devices, it is observed that gender is not a variable that makes a difference. (Hilao & Wichadee, 2017). For this reason, planning in-service training on using mobile devices and applications for teaching is recommended.

A significant difference was found in the analysis conducted to determine whether attitudes towards music software vary according to professional seniority. It was measured that those teaching music for 1-10 years have higher attitudes toward music software than those teaching for more than 11 years. In the comparisons made according to the age factor in technology use, results indicate that the use of technology decreases as the age group increases (Czaja et al., 2006). In the studies conducted on teachers, it is stated that the age factor is ineffective in using technology for instructional purposes (Chow, 2015; Serin & Bozdağ, 2020). In this study, it was found that the attitudes of teachers with less professional experience were higher than those with more professional experience. It is thought that this difference may be due to the teacher's professional commitment and plans, the school's and the teacher's economic situation, and the school administrators' approach. It is recommended that the factors affecting the attitudes of music teachers be examined in different studies.

It was determined that music teachers working in private schools had higher attitude scores than public school teachers. Private and public schools may differ in terms of physical structure, the way courses are taught, social and sportive opportunities, and following educational innovations. Private schools aim to provide a better teaching process and achieve better results due to their structure. Canitez ve Kocabaş (2020) stated that private school administrators contributed more positively to teachers' motivation than public school administrators. Başturan ve

Görgü (2020) found that public school teachers faced higher problems related to school conditions, classroom materials, and class size. Music teachers who receive support in terms of the school administration's approach, the physical infrastructure of the school, and access to necessary classroom materials may be more motivated to follow and use current music technologies.

It was determined that attitudes towards music software did not change according to music teachers' undergraduate department. The primary source of music teachers in Turkey is the music teaching department of the faculties of education. It is also possible for students from the music departments of fine arts faculties and conservatories to become teachers by taking pedagogical formation training. Different studies have been conducted on music teachers' graduating departments. Tokatlı ve Can (2018) determined that the level of perception about the constructivist approach did not change according to their undergraduate departments. Türkmen (2018) stated that conservatory students receiving pedagogical formation education are inadequate in knowing teaching methods and using instructional technologies. Gündoğdu et al. (2018) determined that preservice teachers receiving pedagogical formation education were sufficient in terms of professional and general cultural knowledge, but they were insufficient in the lesson plan, material preparation, and evaluation. Music teaching is a profession that requires multidimensionality (Albuz, 2004). The vocational education process and the on-the-job training process should be organized accordingly. In addition to current teaching methods, following developments related to music and innovations related to music technologies and integrating them into their lessons will contribute to the professional development of music teachers.

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Using WhatsApp in Math Classes in High Schools: Teachers' and Students' Opinions^{*}

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Abstract

Digital technology is prevalent in every aspect of life. WhatsApp is very popular because it is free and user-friendly, offers instant messaging, makes communication faster, and it can also be used on smartphones easily. This study aims to reveal teachers' and students' opinions about using WhatsApp in Math classes. This study is qualitative, and in order to collect data, semi-structured interview form was used. The study was conducted with the participation of 6 Math teachers and 40 students in a state high school. Convenience sampling was done in this study. For the analysis of the data, descriptive analysis technique was conducted. Furthermore, direct quotations from the participants' responses were used. The findings of the study are as follows: Teachers and students use WhatsApp in Math classes mostly to communicate with each other, share information (information, assignments, files, and documents), make announcements, or solve math problems. Participants mentioned both advantages and disadvantages of the application. Among the advantages they mentioned are getting instant feedback, no restrictions on time and space, and sharing multimedia messages. On the other hand, the participants emphasized some disadvantages, such as systemic problems (internet outage, problems with uploading and opening documents); difficulty in communicating with large groups, understanding solutions to math problems, checking assignments; the application occupying too much space on the phone; and becoming addicted to using phones too much. Participants also suggested some upgrades for the application such as being more user-friendly for math classes and having a feature of solving math problems online.

Keywords: Math Classes, WhatsApp, Social Media, Mobile Learning

1. Introduction

1.1 Introduce the Problem

Technology is becoming more appealing for individuals, and keeping up with the digital age for students' increasing and varying educational needs has become inevitable because this process enables students to contact more people, more frequently by using more means (Murray, 2008). Today, technology has become

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an inseparable part of education, and it has influenced teachers' and students' roles. It has led teachers to adopt approaches that inspire and motivate students, make learning easier, and encourage more participation (Onyema & Deborah, 2019). Moreover, social media, which has developed rapidly in parallel with technology, has become an indispensable part of life. In line with the widespread use of the internet, social media offers people convenience in terms of communication and posts in various fields (Sarsar et al., 2015). Social Media tools appeared as an incredible technology that facilitates students' learning (Rasheed et al., 2020). Social media is actively used in every aspect of life for various purposes particularly in education in recent years, and the WhatsApp application is one of them.

1.2 Explore Importance of the Problem

Social media can be defined as web-based services which enable individuals to create half-open or open profiles, communicate with other users, and view others' connections and visits within the system (Boyd & Ellison, 2007). Social media is a powerful tool that makes it possible for people to connect with any person or large groups of people around the world simultaneously, and also to share information (Baishya & Maheshwari, 2020). Besides, the fact that social media has a high level of virtual interaction comfort makes its use more appealing (Sulisworo & Permprayoon, 2018). Today, social media is intensively used by students for sharing information, entertainment, and various activities. According to Chen, social media and social networking sites help students to create a useful learning environment where they can join online discussions (Rasheed et al., 2020). Social networking sites mainly focus on creating online groups that have common interests and activities (Raut & Patil, 2016). Mostafa (2015) defines social media within the context of Web 2.0 as the use of Web-based tools such as YouTube, Facebook, Twitter, and WhatsApp that connect people and enable them to share information, videos, photos, etc. (Mulenga & Marbàn, 2020). These tools and social media are commonly used by students in education. Thus, individuals communicate with their peers on online platforms more; they are more motivated to learn, and they get feedback from each other. The power of social media applications is that they offer students an opportunity to choose and use various tools that are most suitable for their individual learning styles and that can help to improve their academic success. Social media tools encourage students to communicate with each other, express their creativity, and share (Raut & Patil, 2016). Therefore, social media is a platform that allows users to create information, and share it with others, and also encourages individuals to join social networks (Baishya & Maheshwari, 2020). Social networks have changed the way we communicate with each other and share information. Furthermore, social networks offer new opportunities to individuals for interpersonal collaboration and sharing (Murray, 2008). The development of mobile technologies has increased mobile learning practices. Most teachers and students rely on mobile devices to connect to the internet and reach various sources of information and news. Hence, mobile learning has brought convenience and mobility to the educational process (Onyema & Deborah, 2019). On the other hand, mobile devices have gained an important place in education as well as in every aspect of our lives (Poçan et al., 2021) because mobile learning makes it possible for students to reach information in different periods of time. As a result, location or distance is not a barrier for students anymore. In fact, mobile learning is related to learners rather than technology. In this case, students are mobile and at the center of learning. Wireless mobile devices are small enough to be carried.

Mobile devices can be used anytime and anywhere to share information, complete a task, collaborate on a project, or interact (Ally & Prieto-Blázquez, 2014). For example, students can benefit from their mobile phones in many ways such as texting each other, taking and sharing photos or videos, reading news, or checking the agenda (La Hanisi et al., 2018). Particularly in recent years, digital communication has become increasingly popular among students and teachers via channels such as e-mail, SMS, Facebook, Twitter, and WhatsApp (Bouhnik & Deshen, 2014). The fact that mobile technology is available everywhere has drawn teachers' attention to using mobile technology as educational tools. One of the popular applications of mobile technology is WhatsApp (Aburezeq & Ishtaiwa, 2013). Today, the WhatsApp application is one of the most popular communication channels among all strata of society (Agustin & Sari, 2021) because WhatsApp is a free, instant messaging application that is user-friendly and works on various platforms such as iPhone and Android. Thus, the application is preferred by students to text and share multimedia messages such as photos and videos, and it is very popular (Kustijono & Zuhri, 2018; Gon and Rawekar, 2017; Barhoumi, 2015; Johnson & Ewur, 2014). Moreover, further information can be reached in real-time, and sharing this information via technology is both instant and easy (La Hanisi et al., 2018).

WhatsApp instant messaging even facilitates collaboration between students who connect to mobile classes from school or home.

WhatsApp groups can interpret the subjects learned or easily share the information via messaging. WhatsApp offers students an opportunity to create a classroom broadcast or to broadcast their works in the group. In this way, information is easily created via WhatsApp instant messaging, and it can be shared with all members of the group (Barhoumi, 2015). WhatsApp can be regarded as a social network that enables people to reach a vast amount of information fast (Warner, 2018). WhatsApp allows communication among group members without the need for space and time. Members are free to choose when to reach the broadcast information. They can view other group members and communicate with them regarding the information given at a particular time (Clavier et al., 2019). Coronavirus is an infectious and fatal disease that first appeared in Wuhan, China in 2019. Covid-19 affected educational activities adversely as well as all other aspects of life. It hindered academic activities seriously, and most schools around the World were closed because of this (Onyema et al., 2020). During this process, students and teachers adopted various learning-teaching habits. For example, the WhatsApp application started to be used in classes as an online learning environment, one of which is Math class. Math is a universal science that is influential in the development of modern technology and can improve the power of human thinking (Sari & Saputri, 2020). Although Math may seem to be the totality of simple operations, it is one of the indispensable main parts of technology and technological developments (Işık et al., 2008). Math is one of the compulsory school subjects, and it has an important place in the school curriculum (Agustin & Sari, 2021). During the pandemic, teachers used WhatsApp actively in Math classes to share information, homework, problems, or different announcements, also to answer students' questions. Math is really important for humanity, but many people have anxiety or fear about learning. Modern technology can facilitate teaching Math (Afolabi & Durodola, 2018). In this context, it is important to research the effects of WhatsApp, used as an online learning environment, in Math classes from teachers' and students' points of view, and to get their opinions and suggestions. Hence, it is expected that the findings of this study could help and be an example for researchers and teachers who intend to use social media tools as a learning environment.

This study was conducted to get teachers' and students' opinions about using WhatsApp in Math classes in high schools. In line with this general purpose, answers were sought to the following questions:

1. For what purposes do teachers and students in high schools use WhatsApp in Math classes?
2. What are teachers' and students' opinions about using WhatsApp in Math classes in high schools?

2. Methodology

2.1. Research Model / Design

This study is a qualitative one. Qualitative studies are those in which qualitative data collection methods such as observation, interview, and document review are used, and processes are followed to reveal perceptions and incidents realistically and wholly in their natural environment (Yıldırım & Şimşek, 2016). In this study, teachers' and students' opinions about using WhatsApp as one of the social media tools in Math classes in high schools were examined.

2.2. Data Collecting Tools

Research data were collected via interviews with teachers and students. Two different semi-structured interview forms were created for this. In order to create these forms, a literature review was carried out, and then questions were written. Besides, a criterion was determined for the selection of the course, teachers and students: Math classes in high school where WhatsApp was actively used by participants. Semi-structured interviews are those which are as strict as structured interviews, and not as flexible as unstructured interviews. They fall between these two extreme forms (Karasar, 2009). Once the interview forms were prepared, they were presented to three experts in the field (two lecturer from the university and a Math teacher) for review. For the pilot scheme of the interview forms which were edited according to experts' reviews, one teacher and two students were interviewed, and discussions about the questions were held. Then, the final drafts of the interview forms were completed, and the main applications of the interview forms started. Math teachers in the selected school were contacted, and they

were informed about the study. Six Math teachers in the school volunteered to participate in the study. Afterwards, the subject and aim of the study, which was to be conducted in the 9th, 10th, 11th, and 12th grades of the same school, and what was expected from students were explained. Then students who would volunteer to participate in the study were determined. Besides, students' parents were informed, and parental consent was received. Face-to-face interviews with teachers and students lasted 25 minutes on average. Participants' consent for volunteering was received before the administration of the interviews, and also volunteering participants' voices were recorded during the interview. Furthermore, voice records were shared with the related participants, their consent was received, then other interviews were administered. Interviews were administered in the school environment, out of class hours, in the place and time determined by the participants.

2.3. Participants Characteristics

Participants of the study consist of 6 Math teachers working in a high school in Ankara and 40 students from different grades studying in that school in the 2021-2022 School Year. From each grade, 10 students (5 females, 5 males) were chosen. Convenience sampling method was used for the formation of the study group. Convenience sampling provides the researcher with speed and convenience. The researcher chooses a close and easily accessible situation (Yıldırım and Şimşek 2000). In this study, voluntary participation and active use of WhatsApp by teachers and students in Math class were taken into consideration.

Demographic profiles of teachers and students in the study group are given in Figures 1 and 2 below.

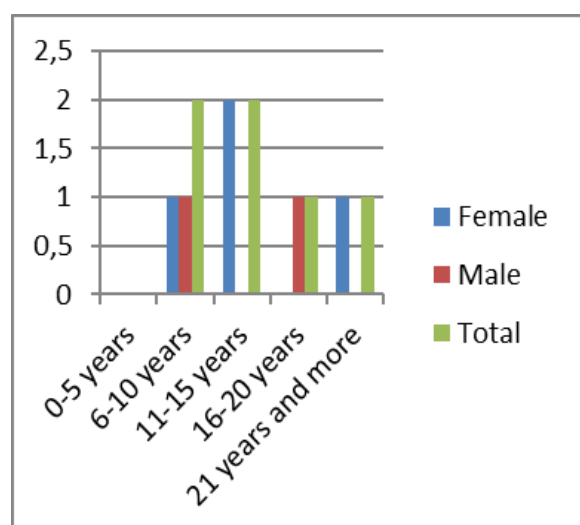


Figure 1: Demographic Profiles of Teachers

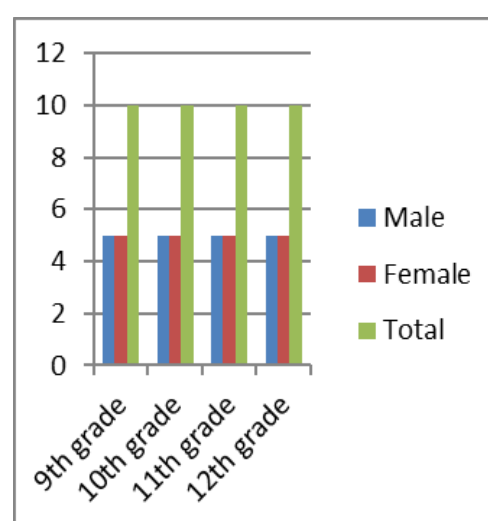


Figure 2: Demographic Profiles of Students

2.4. Data Analysis

For data analysis, interview forms were coded first (Teachers T1, T2 ... T6 and Students S1, S2 ... S40). Besides, all voice records of the participants who consented were transcribed. Collected data were analysed using descriptive analysis technique. Descriptive analysis is a technique in which the collected data are summarized and interpreted according to previously determined themes, direct quotations from the participants are frequently used in order to express them conspicuously, and the findings are interpreted within a cause and effect relationship. While the data can be organized according to the themes determined in line with the research questions, they can also be presented by taking into consideration the questions and dimensions used during the interview and observation processes (Yıldırım and Şimşek, 2016). A frame was formed by arranging the collected data according to the themes determined in line with the questions used in the interview process. Teachers' and students' answers were interpreted and organized according to this frame, and the answers were gathered in a meaningful and logical way. Direct quotations from some of the participants' answers were also included when necessary.

3. Results

Research data are presented under two main headings: “For what purposes do teachers and students in high schools use WhatsApp in Math classes?”, and within this context, “What are teachers’ and students’ opinions about using WhatsApp in Math classes in high schools?”

1. Findings regarding *for what purposes do teachers and students in high schools use WhatsApp in Math classes?* are given in Table 1 below.

Table 1: Situations where WhatsApp is used in Math classes

	Teachers		Students	
	f	%	f	%
Communication (family, teachers, students)	6	100	35	87.5
Sharing information, homework, pdf documents	5	83.3	17	42.5
Making announcements	4	66.6	-	-
Sharing about solving problems (Photos, videos)	2	33.3	26	65
Distance Teaching	2	33.3	-	-
Instant feedback	-	-	8	20
Spare time activities	-	-	2	5

Participants stated that they used WhatsApp mostly to communicate (with teachers, students, and parents) fast and easily. Teachers stated that the application was useful, particularly for instant announcements to students. Besides, teachers remarked that they used the application in Math classes for various purposes such as informing students, sharing class notes/documents, and solving some problems. On the other hand, students used WhatsApp to share difficult problems with their teachers when they couldn’t solve them, and to see the solution to the problems again. Students also preferred the application for different purposes such as communicating with their teachers and classmates fast, getting information about the class, and getting instant feedback for the problems shared. Similar to teachers’ responses, students stated that they used the application to share subjects of the course and solve difficult problems. Different from teachers’ responses, students pointed out that they used the application to share photos and videos, and do spare time activities. (S35) stated “*I use WhatsApp a lot to communicate with my family and friends*”; another participant (S39) remarked “*My friends and I use the application to solve problems or share videos about the class*”; and (S24) said, “*I use the application for online classes and assignments*”.

2. Findings regarding *What are teachers’ and students’ opinions and suggestions about using WhatsApp in Math classes in high schools?* are presented as positive and negative opinions in Table 2, Table 3, and Table 4 respectively.

Table 2: Opinions about sharing and solving Math problems on WhatsApp

Positive Opinions	Teachers		Students	
	f	%	f	%
Sharing solutions instantly	4	66.6	-	-
Getting quick and easy responses to questions	-	-	27	67.5
Individual problem solving	2	33.3	6	15
Seeing different question types	-	-	11	27.5
Negative Opinions				
Not so productive as face-to-face teaching	4	66.6	10	25
Difficulty in communicating in large groups	2	33.3	15	37.5
Not understanding the solution of problems	1	16.6	7	17.5
Systemic problems (internet problem, sharing files)	-	-	9	22.5
Messaging box being closed	-	-	2	

Other	-	-	2	5
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Teachers stated that WhatsApp was useful in terms of sharing solutions to problems fast and easily, and getting instant feedback from students. However, about Math classes, they pointed out that the process was not as productive as face-to-face education. Students stated that the application was useful since they could get instant responses from their teachers, individual problem solving was possible, and they were able to see different question types, but they also emphasized that as the number of students increased, the communication became more difficult. Some of the responses regarding this are as follows: *“Our teachers sometimes close messaging box in group settings. Then we cannot send messages to the group, so we cannot ask questions”* (S10). *“Our teachers should always keep messaging box in the class group open for us”* (S21). On the other hand, some of the students suggested that teachers share solutions to the problems not only by texting but also by video calling or sharing solutions with videos. Students think this would be more useful. Finally, they stated that it would be much better if the application worked offline as well because it requires the internet.

Table 3: Opinions about sharing homework on WhatsApp in Math Classes

Positive Opinions	Teachers		Students	
	f	%	f	%
Easy communication (teachers, students)	3	50	21	52.5
User-friendly (fast, effective)	1	16.6	5	12.5
Determining subjects to study	1	16.6	13	32.5
Instant feedback	-	-	8	20
Not forgetting assignments	1	16.6	2	5
No space-time restrictions	1	16.6	4	10
Motivating for the class	1	16.6	-	-
Negative Opinions				
Difficulty in checking homework	4	66.6	-	-
Homework occupying too much space on the phone	3	50	-	-
Not getting responses for the parts not understood	-	-	15	37.5
Communication problems	1	16.6	28	70
Systemic problems (internet, uploading pdf etc.)	-	-	7	17.5
Addiction to mobile phones	1	16.6	-	-
Other	-	-	5	12.5

Teachers stated that the WhatsApp application had positive contributions in terms of facilitating communication in sharing assignments, instant and effective feedback, not forgetting to submit homework, and being motivating for the class. On the other hand, the very first negative opinion is difficulty in checking assignments. For example, the opinion that when so many messages are sent at the same time, it is difficult to notice the assignments and check them was expressed by (T2) as follows: *“When we want students to send their assignments back on the application, it becomes really hard to follow them in large groups. When there are too many messages on the application, some students’ assignments may not be noticed”*. Besides, teachers pointed out that assignments occupied too much space on the phone, and also it caused addiction to mobile phones. The finding that students’ constant exposure to mobile phones could lead to addiction, and that students may even want to take photos of the information on the board instead of writing them in their notebooks were expressed by (T4) as follows: *“During the pandemic, students were always directed to use their mobile phones to communicate and submit assignments. After a while, this situation caused addiction to mobile phones. Some students even wanted to take photos of class notes or information about assignments written on the board instead of writing them on their notebooks”*. Students stated that WhatsApp facilitated communication when sharing assignments, but sometimes problems in communication could occur. For example, students’ assignments could not be noticed among so many messages sent at the same time, and sometimes there could be systemic problems such as the loss of the internet connection or being unable to upload documents. Thus, they suggested that there could be warnings for unanswered messages by teachers or that each document shared by students could be stored separately on the phones. Furthermore, the

feature of creating a separate filing system for documents sent by each student was also suggested by teachers. According to participants' suggestions, this could make checking assignments much easier. Students also suggested that teachers reply to individual messages sent outside the group and unblock students' posts in groups. Another suggestion was that assignments should be written with highlights (colourful and capital letters, using shapes or charts), and there should be a question-answer session about the assignments, for which a particular day or hour could be determined. A solution to the constant problem with the internet connection was also highlighted among suggestions.

Table 4: Opinions about sharing Math course content on WhatsApp

Positive Opinions	Teachers		Students	
	f	%	f	%
Sharing fast and easily (videos, photos, etc.)	3	50	17	42.5
Providing additional sources	2	33.3	11	27.5
Informing before the exams (subjects, dates, etc.)	1	16.6	8	20
Revision for subjects not understood	-	-	9	22.5
Negative Opinions				
Not being as effective as face-to-face education	5	83.3	27	67.5
Not including online testing programs	1	16.6	4	10
Systemic problems (uploading and opening documents)	-	-	8	20
Lack of communication (late or no feedback, etc.)	-	-	11	27.5

When students and teachers were asked for their positive or negative opinions about sharing Math course content on WhatsApp, the very first response from teachers was to share fast and easily. Besides, they stated that they could provide students with additional sources, which could work as a revision for students. Both students and teachers stated that WhatsApp could not be as effective as face-to-face education and that there should be online testing programs. Teachers suggested that there should be an update and recovery about the speed of uploading and opening documents on the application. Students drew attention to the positive feature of the WhatsApp application in terms of providing additional sources for them to study subjects. Moreover, revision of subjects student could not understand in class, and sharing easily and fast were among other positive opinions. However, students mentioned some systemic problems. For example, one student stated "*Some features for Math classes can be added to WhatsApp. One of these can be a special keyboard for writing symbols used in Math. Or online testing programs can be added*" (S33). Students also suggested that teachers should share recorded video lessons with their own voices. Regarding this, (S17) stated "*Our teachers answer our questions by texting back. If our teachers could video record themselves, teach with their own voices, and share them with us, it would be much better for us*". Another student (S14) responded, "*I become more and more interested in Math as documents, assignments, and subjects are shared on WhatsApp*".

Overall, teachers and students stated that they used the WhatsApp application effectively in Math classes, and it contributed positively to the learning-teaching process. Within this context, using the application on the phone, communicating fast and easily, sharing documents (such as videos, photos, and voice records) easily, understanding abstract concepts better, and being able to create groups were highlighted by the participants. One of the teachers (T6) remarked "*We all use the feature of sharing class notes on the application. Being in contact with our students constantly enables lifelong learning. Nevertheless, students sometimes say that they have not got the documents shared on the application or that they cannot open them*". Another participant (T3) stated "*Pdf files shared on the application work well as additional resources. Thanks to groups, we can easily reach a large number of students, but sometimes it can be hard to text in large groups*". (T2) stated "*We ask students to submit their assignments on the application. If there are too many messages in large groups, it can be hard to check the assignments, and they may not even be noticed*". (S5) stated "*Thanks to this application, I can easily get information about my assignments, we come across different question types in the assignments, but we can ask our teachers right away*". (S14) suggested, "*It would be really nice and useful if our teacher could share the summary of the subjects we have studied*". On the other hand, participants drew attention to the problem that the

WhatsApp application cannot be used on every phone, and a constant internet connection is required. Besides, some other negative opinions include the application lacking problem-solving program, the keyboard not including Math symbols, and video chats allowing only a limited number of participants. For example, one student (S29) stated *“The application is not compatible with all mobile phones. When the assignments are not very clear, there may be so many questions. Although it is not as effective as face-to-face education, it is reasonable under current circumstances, and we can keep class notes”*. Still another student (S33) noted *“It would be really nice if WhatsApp could be used offline as well. Sometimes the files our teacher sends cannot be opened. Some features for Math class can be added to the application. Math symbols cannot be typed on the application. There may be some additions for this”*.

4. Discussion

Findings of the study reveal that the WhatsApp application is mostly used in Math classes in order to communicate fast and easily. Thus, WhatsApp groups have been created among students, teachers, and parents with the participation of a large number of people. WhatsApp facilitates interaction in a group of people who come together for a common interest. It can also facilitate collaboration in learning and teaching, interaction, and active studying (Beguma et al., 2019). Participants stated that they used WhatsApp mostly to share information (such as course content, pdf files, photos, videos, and assignments), solve problems, make announcements, and send and receive instant messages. According to Motiwalla (2007), students use instant messaging as a tool for learning. Thanks to WhatsApp groups, students can share class materials and information about the exams with each other and they can ask questions to their teachers about the subjects they cannot understand (Baishya & Maheshwari, 2020). In this study, teachers and students also highlighted some advantages of the application such as instant feedback and resolution of problems that could not be understood by students.

The findings of this study have similarities with other research findings in the field, or the results support each other. For example, Akdeniz (2016) found in her study that majority of people preferred WhatsApp for communication. The feature of WhatsApp which offers rich message content and enables voice and video chat is influential in these findings. It was also found in this study that students used WhatsApp to share videos and photos and do leisure activities. The findings reveal that the application was used in Math classes mostly to share documents. Another study conducted by Çağlak showed that the groups created on WhatsApp are mostly schoolmates and family. In these groups, participants shared assignments, information, essays, books, and announcements about classes and school, and they talked about subjects about friends, leisure activity forms, and family issues (Çağlak, 2019). On the other hand, Yiğittürk's (2020) study revealed that WhatsApp groups created in schools were used to communicate fast, share information, and make official announcements. In their study conducted with the participation of prospective Turkish Language Teachers, Maden (2019) found that all prospective teachers used WhatsApp to text on the phone.

Among their reasons for using WhatsApp were messaging fast and easily and sharing audio-visual, written, and video documents. Another study in which the effectiveness of WhatsApp among groups of parents was researched revealed that WhatsApp was an effective tool for communication (Ocak 2019). In their study, Çetinkaya (2017) found that WhatsApp had positive effects on success. Balcı and Tezel-Şahin (2018) found in their study that WhatsApp could be used for communication between teachers and parents as well as for teaching and that WhatsApp facilitated informing parents in large groups fast and easily. Şen-Yaman (2016) found that using WhatsApp in teaching Arabic had a significant effect on academic success. In their experimental study, Agustin & Sari (2021) compared two groups: one used WhatsApp and the other did not use it. Their study showed that the application improved Math skills. In their study, Ofori-Kusi & Tachie (2022) researched the effects of the WhatsApp application on teaching and learning Math, and they stated that the application could be an alternative way when face-to-face education is not possible (such as Covid-19). Jere et al., (2019) researched if WhatsApp was effective in teaching and learning Math. The findings revealed that WhatsApp motivated students and teachers more to share information and that the application could be a way of enhancing interest in Math and increasing learning performance. In this digital age, WhatsApp is becoming more and more popular. Its use in the learning and teaching process has become inevitable.

Suggestions for further research are as follows:

- Effects of WhatsApp application at different levels and in all courses in schools can be researched.
- Training can be given about using WhatsApp more productively in the teaching and learning process.
- Studies on WhatsApp can be analysed, and new studies in different designs can be administered.
- Courses about mobile learning tools and their effective use in education can be included in the curriculum of teacher training programs.

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The Effect of Philosophy Education on Mathematics Success*

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Abstract

The aim of this study reveal the effect of philosophy education on students' mathematics achievement. The research sample consists of a total of 38 students, 18 of whom are experimental and 20 of them are control groups, studying in the 7th grade in Şehit Koray Akoğuz Secondary School in İpekyolu, Van in the second semester of the academic year 2019-2020. The mixed method was used in this study because the data of the research were collected both quantitatively. In the quantitative study part of the study, pretest and posttest quasi-experimental design with experimental and control groups was used, and special case design was used in the qualitative study. At the end of the application, individual interviews were made with 6 students in the experimental group using a semi-structured interview form. While in the analysis process of quantitative data independent groups t-test was used, in the analysis of qualitative data, codes were created and data were analyzed. In the process of collecting the data, the experimental group students were given speeches and discussions on philosophy related concepts in elective courses 2 hours a week for 8 weeks by the teacher of Religious Culture and Ethics who was educated in the field of philosophy education and students were taught books on philosophy for children. Control group students continued with the normal curriculum in this process. An achievement test of 22 questions was developed by taking expert opinion after its validity and reliability were made by the researcher. The achievement test was applied to both groups as a pre-test before the application and as a post-test at the end of the application. In the analysis of qualitative data, a semi-structured interview consisting of 4 questions prepared by the researcher with expert opinion was applied with 6 students from the experimental group. As a result of the quantitative analysis, it was concluded that philosophy education had a positive effect on students' mathematics achievement. As a result of qualitative analysis, philosophy education improved students' sense of curiosity, helped in solving math problems, and improved students in reading comprehension. Also, another result is that students' interest in philosophy has increased.

Keywords: Philosophy, Philosophy Education, Mathematics and Philosophy, Mathematics Education

1. Introduction

Today, mathematics is not perceived as a collection of abstract concepts and skills that need to be learned, as it used to be, but as knowledge that is based on modeling reality, formed through the process of problem solving and interpretation, and skills that develop in this process. In line with this understanding, the goal of learning

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mathematics has been to provide mathematical disposition rather than isolated mathematical concepts and skills (De Corte, 2004). Mathematical aptitude, or in other words, a tendency to do mathematics, well-organized instructional content, mastery in using problem-solving strategies, cognitive and affective self-regulation skills, It is directly related to beliefs about mathematics and problem solving, and it requires the development of these abilities of students first (Altun, 2010).

Philosophy is another branch of science that develops the student's ability to ask questions and develops their ability to question and criticize. The general purpose of philosophy is the field of interest of people who seek knowledge, try to learn, and do it with love. The most important feature that distinguishes philosophy from other branches of science is its self-questioning. From this point of view, philosophy appears as an educational process. According to Çotuksöken (2005), philosophy education is related to asking questions, turning to the existing with questions, looking at the existing by changing the point of view, and a special kind of thinking and expressing education. Thinking philosophically, knowing philosophically, living philosophically, always accompanies the in-between person in her actions and relationships. This way of thinking is also functional in evaluating it as an educational context. This functional dimension is related to the critical thinking dimension. The center of philosophy education lies in certain questions that the reflective human mind finds. Naturally, the best way to start philosophy education with surprising questions is to think (Nagel, 1987).

Various methods have been tried in order to increase the quality of education in our country and in the world. Many studies have been done for this, the factors affecting the success levels have been examined and many researches have been done in this sense. When necessary solutions can be produced for these factors, students' mathematics achievement can reach the desired level. The following objectives are expected from the students in the general objectives of the MEB mathematics curriculum:

Will be able to develop and use mathematical literacy skills effectively.

Will be able to use mathematical terminology and language correctly to explain and share mathematical ideas in a logical way.

By using the meaning and language of mathematics, she will be able to make sense of the relations between people and objects and the relations of objects with each other.

They will be able to develop their metacognitive knowledge and skills and consciously manage their own learning processes.

In the problem solving process, they will be able to easily express their own thoughts and reasoning, and will be able to see the deficiencies or gaps in the mathematical reasoning of others.

Considering these items, students are expected to use what they have learned in mathematics rather than memorizing in daily life, to establish relationships between objects and people, to reveal their own original ideas, and to be able to realize their own deficiencies and produce solutions for them. Likewise, the aim of philosophy education is; It is to raise courageous modern people who know how to think, who make meaningful criticism, who doubt, who try to learn and question, who are in an effort to learn rather than getting information directly (Taşdelen, 2007).

When the results of PISA (The Program for International Student Assessment), one of the international exams held in our country, are analyzed, Turkey was ranked 50th out of 72 countries in terms of mathematical literacy. Mathematical literacy focuses on measuring students' ability to use, interpret and mathematical logic in mathematics (PISA, 2015).

The fact that mathematics and philosophy are in a close relationship, the expectations of the Ministry of National Education in the mathematics curriculum are parallel to this, the deficiencies in mathematics education considering the situation of our country in international platforms and the fact that there are very few studies on this subject in the literature review, and the fact that philosophy education in England has a positive impact on students. The results of a study examining the effect of this issue necessitated the study of this subject (Gorard, Siddiqui & See, 2015).

In the study of Badri and Vahadi (2017), in which they examined the effect of the philosophy teaching program to children, they aimed at the effect on the spiritual intelligence of female students. According to the pre-test and post-test results, it was observed that there was a significant increase in the psychological intelligence of the girls in the experimental group.

Erfani and Rezai (2016) studied with female students of a school in Hamedan in the academic year 2010-2011 to determine the effect of teaching philosophy on students' critical thinking. As a result of the research, it has been shown that teaching philosophy can improve students' critical thinking.

Sare, Luik, and Tulviste (2016) examined the effect of the philosophy program for children on the verbal reasoning skills of preschool children. The students in the experimental group showed an increase in their reasoning, verbal reasoning, reasoning and analogy skills.

In their study, Abaspour, Nowrozi, and Latifi (2015) examined the effect of philosophy in children on the spiritual development of female students. The findings of this study showed that the practice of philosophy activities led to students' spiritual development in terms of God awareness, majesty, and instability, but did not affect students' spiritual development in terms of impression management and realistic acceptance.

In their study, Ghaedi, Mahdian, and Fomani (2015) aimed to teach children the elements of creative thinking according to Torrance's creative thinking framework in preschool children. As a result of this study, an increase was observed in children's creative thinking skills, their ability to gain a different perspective and produce original ideas.

Pourtaghi, Hosseini, and Hejazi (2014) examined the effect of philosophy on children's creativity in their study. It has been concluded that philosophy in children increases children's creativity.

In the study of Polat and Akay (2020) on the effect of philosophy education on the brain development of early children, it was concluded that the philosophical education to be given in the pre-school period would enable children to start primary school with equal opportunities in terms of development. In addition, the idea has emerged that the way to raise generations that will make a difference in the future is through the individual's philosophical thinking skills.

Dirican (2018) examined the effect of philosophy education activities applied to preschool children on the philosophical attitudes and behaviors of children. As a result of the research, it was concluded that the philosophy education activities contributed to the development of the philosophical attitudes and behaviors of the children in the experimental group. In addition, it has been observed that children have a positive effect on their ability to make predictions, realize their thoughts, express different opinions, be tolerant, be curious about what is happening around them, and ask questions.

Koyuncu (2018) investigated the effectiveness of philosophy of mathematics activities on students' attitudes towards mathematics, beliefs and mathematical thinking variables. At the end of the analysis; It was observed that Philosophy of Mathematics Activities increased students' attitudes and beliefs towards mathematics positively, but did not cause any statistically significant difference in mathematical thinking skills.

Taş (2017) examined the effect of the Philosophy Education Program for Children on the theory of mind and creativity of 48-72 months old children. As a result of the research, a statistically significant difference was found in favor of the experimental group between the total scores of the children in the experimental group and the control group, and the scores obtained from the creativity post-test and the scores of the creativity sub-dimensions. According to the results of the research, Philosophy for Children has positive effects on the theory of mind and creativity of 48-72 months old children.

Kartalçı, Acar, Merve, and Işık (2021) conducted a study on 9th and 10th grade students' philosophical thoughts about the nature of mathematics and their mathematical resilience.

Yazıcı (2015), in his study to examine the relationship between music education and philosophy and to reveal the necessity of philosophical-based music education, partially included the philosophy course in the music teaching departments until today, that it is one of the problems in our national music education system, that an attitude towards philosophy is exhibited, He concluded that these sections prevent them from being places where information is used and how to use information is taught rather than places where information is obtained. As a result of this, it has been seen that the music educator cannot raise individuals who can solve problems and think critically, creatively and reflectively, therefore, cultural-artistic gains cannot be achieved on the right basis.

Kılıç (2019) conducted a study of pre-service mathematics teachers to reveal their philosophical views on the nature of mathematics, and concluded that the pre-service teachers had views on quasi-experimental philosophy, which could be due to the impressions they had in the field education courses they took during the pedagogical formation certificate program.

Yeşilyurt-Çetin (2021) aimed to determine the place and importance of philosophy of mathematics in mathematics education in her study to reveal expert opinions on philosophy of mathematics and mathematical thinking. According to the results of the research, the instructors explained mathematical thinking as an abstract and coherent thinking for generating new information and solving problems using previous knowledge and high-level thinking skills. They defined the philosophy of mathematics as the act of questioning the nature and concepts of mathematics, thinking about mathematics in order to understand mathematics, discussing and explaining mathematical concepts. Instructors stated that the philosophy of mathematics course, which is important in terms of understanding, explaining and applicability of mathematical knowledge, also increased the interest and admiration for mathematics and suggested that this course should be included in the curriculum.

1.1 Purpose and Importance of the Research

The aim of this research is to examine the deficiencies in the literature and the effect of philosophy education on the mathematics achievement of seventh grade students in order to improve the level of students in mathematics education.

When the literature is examined, there are almost no studies on philosophy education at secondary school level. Most of the studies in Turkey remain at the qualitative level and the sample of most studies is pre-school students. In addition, in retrospect, although philosophy and mathematics are in a very close relationship, it is important to study the subject that there are very few studies on this subject.

On the other hand, the findings of the study and the blending of philosophy with mathematics to gain a new perspective, the students' development of a positive perspective towards philosophy, and the use of philosophy in order to prevent negative attitudes towards mathematics in Turkey are other important points.

1.2 Research Problem

The main problem statement of this research is to examine the effect of philosophy education on mathematics achievement. In line with this main problem, the following sub-problems were determined.

1.2.1 Subproblems

1. Is there a significant difference between the pretest and posttest achievement scores of the experimental group?
2. Is there a significant difference between the pretest and posttest achievement scores of the control group?
3. Is there a significant difference between the posttest achievement scores of the students in the experimental and control groups?
4. How does philosophy education affect the reasoning skills of the experimental group students?

2. Method

2.1 Population and Sample of the Research

As seen in Table 1, a pre-test was applied to both groups before the application, and the experimental group was taught about philosophy education for two hours a week for eight weeks. The effect of philosophy education on mathematics achievement was examined by applying an achievement test eight weeks after the application.

Table 1: Representation of the Research Model

Groups	Pretest	Working Process	Lasttest
Experimental Group	Achievement test consisting of 6th grade subjects	Two hours of elective courses were taken from the elective courses without interruption of the education-training program, and a course on philosophy was taught to the children by the Religious Culture and Moral Knowledge Teacher, who was educated in the field of philosophy, and this process lasted for 8 weeks.	Achievement test consisting of 6th grade subjects
Control Group	Achievement test consisting of 6th grade subjects	In the control group, normal education was carried out for 8 weeks without any study on philosophy education.	Achievement test consisting of 6th grade subjects

In the section where the qualitative research method was applied, the participants were determined according to purposive sampling, which is one of the non-random sampling methods. In this method, it is used in cases where the sampling units, that is, the probability of being selected for the sample, are not the same. Since it was desired to select situations that would provide diversity in terms of information in accordance with the purpose in order to conduct in-depth research, this sampling was applied (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2015). The participants of this sample consist of a total of 6 students from the experimental group. The students participating in the study were selected on a voluntary basis

Table 3: Topics Covered by Experimental Group Students Every Week

1th week	In the first week, speeches and discussions were held on the concept of love. Questions were asked to the students at the beginning of the lesson on this subject, and it was tried to arouse their curiosity. Parallel to the teaching of the lesson, the teacher asked What is Love? A part of the book called "The book" was read and the students were asked to express their thoughts on the subject and the opportunity to discuss with their friends was provided and students' participation in the lesson was ensured.
2th week	In the second week, speeches and discussions were held on the concept of friendship. What is Friendship on this topic? chapters from the book were read. The course content has progressed as in the previous week.
3th week	In the 3rd week, there were speeches and discussions on the concept of success and failure. Chapters from the book Success and Failure on this subject have been read. The course content has progressed as in the previous week.
4th week	The topic covered with the students in the 4th week was related to the development of the students' sense of self. About this Who Am I? The book was used. The course content has progressed as in the previous week.
5th week	The subject covered with the students in the 5th week was about human behavior. How Should I Behave About This Issue? and Do I Need Others? certain parts of his books were read. The course content has progressed as in the previous week.
5th week	In the 6th week, the subject discussed with the students was about goodness and evil. On this subject, the books What is Goodness? What Is Moral and What Is Not have been used. The course content has progressed as in the previous week.
7th week	In the 7th week, the subject of death and life was discussed with the students. The book

	Life and Dying as a book determined the content of the course. The course content has progressed as in the previous week.
8th week	The subject covered by the students in the 8th week was on the concept of time. The book on this subject, Time is Too Much and No Time is the content of the course. The course content has progressed as in the previous week.

The content of philosophy education consists of topics such as love, friendship, goodness, friendship at a level that children can understand. First of all, the students were asked questions about these concepts at the beginning of the lesson and it was tried to arouse the curiosity of the students. Afterwards, certain stories from philosophy books for children were read by the teacher. The students were allowed to talk about the story, and the opinions of the other students were taken to the questions asked by the students and it was tried to ensure the participation of the students in the lesson. Apart from the discussions in the lesson, the books suitable for the level of the students were given and they were allowed to read them alternately. These books are: The Philosopher Boy/How Should I Behave? The Philosopher's Machine and a Roadmap: How to Make Philosophy for Children (P4C)?, The Philosopher Boy/Who Am I?, The Philosopher Boy/What Is Love?, The Philosopher Boy/Do I Need Others? , The Philosopher Child/What is Friendship? Word and Silence/Crispy Philosophy, Me and Others/ Crunchy Philosophy, Believing and Knowing/Crummy Philosophy, Philosopher Child/ What is Kindness?, Moral and Non-Moral/ Crunchy Philosophy, Success and Failure/ Crispy Philosophy, Life and Dying/ Crispy Philosophy, Too Much Time and No Time/ Crispy Philosophy. At the end of this process, a post-test was administered to the experimental group students.

The control group did not receive any training during this period and continued with the normal education program. In the process of obtaining qualitative data, a semi-structured interview was applied by going to the homes of 6 experimental group students. A voice recorder was used in the interviews and the duration of the interviews lasted approximately 5-10 minutes.

2.4 Data Collection Tools

As a data collection tool in the research, an achievement test of 25 questions covering 6th grade mathematics was prepared. In order to determine the content validity of the test, the opinions of an expert lecturer and three mathematics teachers were consulted. A pilot study was conducted with 7th grade students to determine the reliability of the achievement test. 70 students in a secondary school in Van province İpekyolu district participated in this pilot application. As a result of the application, the reliability of this test was found to be 0.76. However, since the item difficulty of the 4th, 22nd and 23rd questions in the test was below 0.20, they were excluded from the test. Thus, the Cronbach Alpha coefficient was calculated as 0.80.

In the qualitative part of this research, semi-structured interview was used as a data collection tool. The reason for using this data collection tool is that the interviews are more flexible and provide the opportunity to ask additional questions depending on the course of the interview. Thus, the meeting became more efficient. Six open-ended questions were initially determined by the researcher, but the number of questions was reduced to four with the contribution of an expert academician and two mathematics teachers who had a master's degree in measurement and evaluation. In this way, the questions were given their final form. Interviews were conducted with six students from the experimental group in the study, and the interview took approximately 5-10 minutes. Interview questions are as follows:

1. What are your thoughts on developing the sense of questioning and curiosity about these applications made in elective courses?
2. What do you think about the philosophy books you have read within the scope of this application to give a different perspective on solving mathematical problems?
3. What are your thoughts on whether this application is helpful in solving the problems you encounter in daily life?
4. When we consider the benefits of these applications within the scope of mathematics, what can you say about this subject?

2.5 Analysis of Data

The aim of the research is to examine the effect of philosophy education on mathematics achievement. The study is a quasi-experimental study and an achievement test was applied to the students. SPSS.22 package program was used in the analysis of the study.

Before starting the application, it was checked whether the pretest achievement scores of the experimental and control groups were normally distributed. The achievement test scores applied to the students were entered into the SPSS.22 package program and the normality status was examined. To examine whether a test is normally distributed, one of the Kolmogorov-Smirnov or Shapiro-Wilk tests should be performed. It is expected that Kolmogorov-Smirnov (K-S) test will give more reliable results in cases where the sample size is above 50, and Shapiro-Wilk test will give more reliable results when the sample size is below 50 (Büyüköztürk, 2015).

Since the control group consisted of 18 students in the study, the Shapiro-Wilk significance value was checked in the normality test and this value was found to be 0.953. Since the normality analysis was greater than 0.05, the pre-test scores of the control group showed a statistically normal distribution. In the study, this value was found to be 0.275 in the Shapiro-Wilk significance test of the experimental group, whose sample number consisted of 20 students. Since the normality analysis was greater than 0.05, the pre-test results of the experimental group showed a statistically normal distribution. The normality test analysis results for the experimental and control groups are shown in Table 4.

Table 4: Experimental and Control Group Pre-Test Normality Analysis Results

		Kolmogorov-Smirnov			Shapiro-Wilk		
	Group	Statistics	Sd	p	Statistics	Sd	p
Pretest	Control	.156	18	.200	.980	18	.953
	Experiment	.149	20	.200	.943	20	.275

Before starting the research, it was checked whether the groups were equivalent according to their pretest scores. For this purpose, data entry was made to the SPSS.22 package program and it was examined whether the success scores of the two groups were significant. The results of the analyzes performed with the Independent Sample t-Test are shown in Table 5.

Table 5: Independent Sample t-Test Results Showing the Equivalence of the Groups

	Group	N	\bar{X}	S	t	Sd	p
Pretest	Class A	18	10.06	3.72	-1.279	36	.209
	Class C	20	11.35	2.46			
	Total	38					

When Table 5 was examined, the p value was found to be 0.209 (>0.05). Considering this result, it is seen that the experimental and control groups are equivalent to each other according to the pretest success score.

In the post-application analyzes, it was checked whether the post-test achievement scores of the experimental and control groups were normally distributed. SPSS.22 package program was used for analysis.

Table 6: Experimental and Control Group Post-Test Normality Analysis Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
Posttest	Statistics	Sd	p	Statistics	Sd	p
	.092	38	.200	.969	38	.372

When Table 6 is examined, it shows the normality analysis made for the experimental and control group post-test. According to the Shapiro-Wilk normality analysis, the significance value was found to be 0.372. According to this result, the post-test achievement scores of the experimental and control groups show a normal distribution.

The data obtained in the qualitative part of this research were found by content analysis method. The data obtained in content analysis is examined more closely and it is aimed to make these data more understandable (Yıldırım & Şimşek, 2008). For this purpose, codes and themes were extracted from the data obtained from the participants, and the raw data were arranged and made more understandable. The raw data were coded by three experts. Two of the experts had a master's degree in measurement and evaluation, and the other expert consisted of a lecturer who gave the "Qualitative Data Analysis in Science Education" course for her master's degree. Three researchers came together and then compared the coding. As a result of this comparison, it was understood that the coding similarity was 79%. The data obtained are supported by tables and presented in a way that readers can understand.

3. Results

3.1 Findings and Comments on the First Sub-Problem

The first sub-problem of the study was "Is there a significant difference between the pre-test and post-test scores of the experimental group?" expressed as.

The application data consists of the answers to the 22-question achievement test applied to 20 experimental group students. Studies on 8-week philosophy education were carried out to the experimental group students. Students were given an achievement test before and after the application. The results of the dependent sample t-test analysis applied to the pre-test and post-test scores of the experimental group are given in Table 7.

Table 7: Analysis of Experimental Group Pretest and Posttest Success Scores

	N	\bar{X}	S	t	Sd	p
Pretest	20	11.35	2.46	-5.33	19	.00
Posttest	20	14.20	2.69			

When Table 7 is examined, the arithmetic mean of the pretest scores of the experimental group was 11.35, while the arithmetic mean of the posttest scores was 14.20. The significance value between the pretest and posttest scores was found to be .00 ($< .05$). As a result of the study, a statistically significant difference was found between the pretest and posttest scores of the experimental group consisting of 20 people. This difference was in favor of the post-test.

3.2 Findings and Comments on the Second Sub-Problem

The second sub-problem of the study was "Is there a significant difference between the pre-test and post-test scores of the control group?" expressed as.

The application data consists of the answers of the 22-question achievement test presented to 18 control group students. The normal education curriculum was applied to the control group. Pre-test and post-test were administered to the students at 8-week intervals. The results of the dependent sample t-test analysis applied to the pre-test and post-test scores of the control group are given in Table 8.

Table 8: Analysis of Control Group Pretest and Posttest Success Scores

	N	\bar{X}	S	t	Sd	p
Pretest	18	10.06	3.72	-1.42	17	.174
Posttest	18	11.11	3.87			

When Table 8 is examined, the arithmetic mean of the pretest scores of the control group was 10.06, while the arithmetic mean of the posttest scores was 11.11. The significance value between the pretest and posttest scores was 0.174 ($> .05$). As a result of the study, no statistically significant difference was found between the pretest and posttest scores of the control group consisting of 18 people.

3.3 Findings and Comments on the Third Sub-Problem

The third sub-problem of the study was “*Is there a significant difference between the post-test scores of the students in the experimental and control groups?*” expressed as.

The data group of the third sub-problem consists of a total of 38 students, of which 20 are in the experimental group and 18 in the control group. The application data consists of the results of the 22-question achievement test. The results of the independent groups t-test analysis applied to the posttest scores of the experimental and control groups are given in Table 9.

Table 9: Deney ve Kontrol Grubu Son-Test Başarı Puanlarının Analizi

	Group	N	\bar{X}	S	t	Sd	p
Posttest	Class A	18	11.11	3.87			
	Class C	20	14.20	2.69	-2.885	36	.007
	Total	38					

When Table 9 is examined, the arithmetic mean of the posttest scores of the control group was 11.11, while the arithmetic mean of the posttest scores of the experimental group was 14.20. A statistically significant difference was found between the experimental and control group posttest scores ($p = .007 < .05$). In other words, the difference between the arithmetic mean of the posttest scores of the experimental group and the control group was found to be 3.09, and this difference is statistically significant.

3.4 Findings and Comments on the Fourth Sub-Problem

Table 10: The Opinions of the Experimental Group Students on Philosophy Education on Developing the Sense of Inquiry and Curiosity

Codes	S1	S2	S3	S4	S5	S6
The student's ability to take their thoughts to the next level	+	-	+	-	-	+
Build self-confidence in students	+	-	+	-	+	-
Students can freely express their thoughts	+	-	-	+	-	-
Students can express themselves better	+	-	-	-	+	-
Giving a different perspective	-	+	-	+	+	-
Developing empathy in students	+	-	-	+	-	-
Encouragement to learn something new	-	+	-	-	-	+
Developing a positive attitude towards the lesson	-	+	-	-	+	-
Creating a sense of curiosity in the students outside of the lessons learned	+	-	+	-	+	-
The sense of curiosity creates feedback on the student	-	-	+	+	-	-
Making inquiries more efficient	-	-	+	-	+	-
Developing a sense of curiosity towards books	+	+	-	-	-	+
Developing a sense of curiosity towards life	-	+	-	-	+	+
To question life	-	-	-	+	+	-
Increasing the authority to ask questions	+	-	-	+	-	-
Creating a research request	-	-	-	+	+	-
Learning by questioning	-	-	-	-	+	+

When Table 10 is examined, the effects of the practices on students consist of two sub-themes. Considering the general effects of these practices, it is determined that most of the students gain different perspectives, the students feel more self-confident, and they carry their thoughts to a higher level.

Regarding taking their thoughts to an advanced level and expressing their thoughts freely, the student with the code S1 said, *"For example, it has taken our thinking level to an advanced level, you know, it has increased our self-confidence and expressing our thoughts more freely."* he expressed his opinion.

The student with the code S4 about gaining a different perspective of philosophy *"When we dealt with the subject of philosophy, it gave us different perspectives, not just our opinions, It has given us a different perspective, that is, other people look at an object we look at differently"* he expressed his opinion.

In the sub-theme of the applications to develop a sense of questioning and curiosity in students, the majority of the students stated that they were more curious about books, their sense of curiosity towards life developed, and they learned by questioning.

Regarding the development of the student's sense of curiosity towards books, the student with the code S3 said, *"I also developed an extreme sense of curiosity. After our discussions in the lessons, when I came home, I was taking notes on the subject on the computer and I had created a notebook for myself. Thus, I was asking the remaining questions to the teacher."* expressed his opinion as. Similarly, the student with the pseudonym S5 said, *"I have a sense of curiosity. We were doing more research on the subjects we did not know, we presented our thoughts on it. Thanks to these lessons, we learned what to expect and how."* expressed an opinion.

Regarding the sense of curiosity towards life and questioning life, the student with the pseudonym S6 said, *"I started to wonder more about the things around me, I started to question more."* expressed an opinion.

Table 11: Opinions of Experimental Group Students on the Books They Read Gain A Different Perspective in Solving Mathematical Problems

Codes	S1	S2	S3	S4	S5	S6
Developing processing skills	-	-	-	+	+	+
Speeding up problem solving	+	-	-	+	+	-
Discovering different solutions	+	-	-	+	-	-
Provide a more persistent approach to solving questions	-	-	+	-	-	+
Better understanding of the meaning relationship in questions	-	+	+	-	+	+
Searching for causality in the solution of the problem	-	-	+	-	-	+
Realizing that mathematics has a logical basis	-	+	-	+	-	-
Understanding that mathematics is not an abstract course	-	+	-	+	-	-
Developing verbal logic	+	-	-	-	+	-
Realizing that the questions are more understandable and clear	-	-	+	-	-	+

When Table 11 is examined, in Table 11, there are codes for the books that the students in the experimental group read about philosophy to gain a different perspective in solving mathematical problems. Most of the students stated that they noticed the meaning relationship in the questions more, they could understand even the questions well, they accelerated the problem solving and the questions had a logical basis.

Regarding the realization of the semantic relationship in the questions and the logical basis in mathematics, the student with the code S3 said, *"I focused more on the mathematics questions, about the meaning relationship, for example, why did I solve this question like this, why did I do it, these developed better with philosophy."* expressed an opinion.

Likewise, the student with the pseudonym S2 said, *"After reading the philosophy books, I tried to do mathematics more on logic rather than numerical memorization."* expressed an opinion.

Regarding the code of discovering different solutions in mathematical problems, the student with the nickname S1 said, *"First of all, we started with the examples we saw first. So we realized that we could solve these tests in two or three ways, not just one method."* expressed an opinion.

Regarding speeding up mathematical problems by reading philosophy books, student S4 said, *"We normally spent two hours doing operations in mathematics, but with philosophy we both improved our reading and gained speed in operations. So it accelerated us."* presented the idea.

Table 12: Student Opinions on the Points where the Application Helped Students in Solving Daily Life Problems

Codes	S1	S2	S3	S4	S5	S6
The books read accelerate the students in other areas as well.	+	-	-	-	-	+
Developing a different perspective on life	+	-	-	+	+	-
Destroying prejudice against people	+	-	+	-	-	-
Fostering the development of empathy	+	+	-	+	-	+
Developing an understanding of life and people	+	-	-	+	-	-
Using the learned information in daily life	-	+	+	+	-	-
Raising awareness in family, friends and environment	+	+	+	+	+	-
Providing better solutions to problems	+	+	+	-	+	-
Providing healthier solutions in friendship relations	-	+	+	+	+	-
Development of exchange of ideas in problem solving	-	-	+	-	+	-
Recognizing the importance of speaking in solving problems	-	-	-	-	+	+

When Table 12 is examined, it is seen that thanks to the application, most of the students have developed a sense of empathy, awareness in friendship relations with their families and their surroundings, and they can produce better solutions for problems.

Regarding the development of empathy, the student with the letter S1 said, *"Instead of acting prejudiced against a person, he filtered a person and showed empathy by empathizing with him."* expressed his opinion. Parallel to this code, the student with the code S4 said, *"We used to think that we were right when we had an argument with someone, but after thinking about such matters, we realized that we might be wrong, and we needed to be in his place a little bit."* expressed an opinion.

The student with the nickname S2, who said that the discussions in the classroom created awareness in his relations with his friendship, family and environment, said, *"I was sharing the information I learned from there with my friends and family, I could find a better solution in the face of a problem."* expressed an opinion.

In terms of producing healthy solutions in friendship relations, the student with the pseudonym S3 said, *"When we had problems with friends, we immediately thought of the topics we talked about in the class or from those books in the group. We were getting everyone's ideas and trying to find a common solution."* presented the idea. Similarly, the student with the nickname S5 said, *"We used to get angry with our friends when we argued with them, but now I think our capacity has increased enough to solve the problem."* used an expression.

Table 13: Student Opinions on the Benefits of the Application within the Scope of Mathematics

Codes	S1	S2	S3	S4	S5	S6
Increasing comprehension capacity	+	+	+	+	+	+
Increasing problem solving speed	-	-	-	+	+	-
Developing the ability to go into detail	-	+	-	+	+	+
Recognizing the verbal aspect of mathematics	-	+	+	-	-	-
Helps in transitioning from abstract to concrete	-	+	+	-	-	-
Making math lesson more understandable	-	+	-	-	+	-
Better understanding of cause and effect relationship in math questions	+	+	-	-	+	+
Developing reasoning skills	-	+	-	-	+	+
Going deeper in solving questions	-	-	-	-	+	+

When Table 13 is examined, most of the students emphasized that the first of the benefits of philosophy education within the scope of mathematics is that it increases their understanding capacity. Apart from this, they stated that they went into detail in the questions, they noticed the cause-effect relationship more in the problems, and their reasoning skills improved.

While S6 students stated that their comprehension capacity increased, *"I started to understand problems more easily"*, S1 student said *"Not only in mathematics but also in Turkish, for every lesson, this was like the second step of our life. While reading the question at first, looking blankly, now thinking and understanding that question, this application helped to solve it."* presented the idea.

The student with the pseudonym S2 explained that *"Usually it was more helpful in the face of problems. I started to understand mathematics better; I started to go into the details of the questions. After the subject was explained in mathematics, we were thinking about the reason for that subject, not just memorizing it numerically. This made the math more meaningful."* made a statement.

Apart from that, student with the nickname S3 said, *"Mathematics was difficult before, I only thought of it as a problem or an operation, but thanks to this application, mathematics is no longer registered numerically for me, but also verbally. For example, I took out the meaning in the sentence, so this helped me a lot. It was a transition from abstract to concrete for me."* While using the expression *"S5, we used to think while reading the questions, what does he mean here, but now I can understand faster. When I read a question, I used to skip some details, but now I understand every detail."* expressed an opinion.

Apart from this question, the student with the pseudonym S5 said, *"Philosophy has gained a different perspective. It prompts people to questions, it satisfies my curiosity, and it improved me a little more."* used an expression.

4. Conclusion, Discussion and Recommendations

In this section, the findings obtained from the sub-problems of the research are discussed with the findings obtained from other similar studies, the results obtained from the sub-problems, and suggestions for practice and researchers based on the findings obtained.

4.1 Discussion and Conclusion

In this study, in which the effect of philosophy education on the mathematics achievement of 7th grade students was examined, experimental design with pretest posttest control group was used. Before starting the research, it was checked whether the experimental and control groups were equivalent to each other in terms of levels, by applying a pretest. As a result of the analysis, no statistically significant difference was found between the experimental and control groups, and the groups were found to be equivalent to each other.

When philosophy education is examined, there are many studies on the effects of philosophy education on students (Badri & Vahadi, 2017; Erfani & Rezai, 2016; Sare, Luik & Tulviste, 2016; Marashi, 2009; Matsuoaka, 2007; Polat & Akay 2020; Dirican, 2018). ; Taş, 2017; Sönmez, 2016; Çayır, 2015; Kefeli & Kara, 2008; Okur, 2008; Yazıcı, 2015); Few studies have been published on its effect on mathematics achievement (Daniel, Lafortune, Pallascio, Splitter, Slade, & Garza, 2005; Koyuncu, 2018; Kartalcı, Acar, Merve, & Işık, 2021; Kılıç, 2019; Yeşilyurt-Çetin, 2021). Looking at the literature review, the original side of the research emerges.

In the first sub-problem of the study, a statistically significant difference was found between the pre-test and post-test scores of the experimental group. The arithmetic mean in the post-test scores of the students in the experimental group increased compared to the arithmetic mean in the pre-test scores. This increase was statistically in favor of the post-test. According to this result, it can be said that philosophy education had an effect on the mathematics achievement of the experimental group. This result is similar to the experimental studies of Trickey and Topping (2004) on the mathematics achievement of students and the study of Overton (1993) regarding the effect of teaching thinking skills on students' academic success. In these studies, a statistically significant difference was found between the post-test and pre-test application of the experimental group in favor of the post-

test. Williams (1993) did not find a statistically significant difference in the experimental group in her study examining the effect of philosophy on secondary school students. She interpreted the reason for this as the fact that the study lasted 8 months and 27 hours in total. In our study, the study lasted 8 weeks and a total of 16 hours, and a significant difference was found. It can be said that this difference will increase if the study lasts longer.

In the second sub-problem of the study, the arithmetic mean of the post-test scores of the control group students showed a slight increase compared to the arithmetic mean of the pre-test scores, but there was no statistically significant difference between the pre-test and post-test scores of the control group. Similar results were obtained in some experimental studies (Trickey & Topping, 2004; Daniel, Lafortune, Pallascio, Splitter, Slade & Garza, 2005; Koyuncu, 2018). The reason for the increase in the post-test scores of the control group students is that it is difficult for the selected students to be selected by the random assignment method. In order not to disrupt the teaching flow, quasi-experimental design was used in the research since it is not possible for the students to be equal in every respect. In this design, the experimental and control group students are not equal in terms of all variables. As a matter of fact, Akdağ and Tok (2010) listed similar reasons as the reason for the increase in the post-test scores of the control group students in their study in which they examined the effects of traditional teaching and powerpoint presentation supported teaching on students.

In the third sub-problem of the study, a significant difference was found between the post-test scores of the students in the experimental and control groups. It can be said that this difference is effective on the mathematics achievement of the students of philosophy education. As a matter of fact, the difference of 3.09 between the post-test scores of the experimental and control groups shows this. In-class discussions with the students, the books they read about philosophy, improved the questioning skills of the students and developed different perspectives in the students. As a result of this, students' academic success in mathematics increased and this was reflected in the post-test. This finding indirectly supports the research findings of Trickey and Topping (2004). Daniel, Lafortune, Pallascio, Splitter, Slade, and Garza (2005) obtained similar results in the study in which students examined critical thinking processes through discussion by using philosophy in mathematics activities. The use of philosophy in classroom discussions has increased students' mathematics achievement, and besides, it has had positive results such as improving students' critical thinking, questioning and reasoning skills. As a result of the research conducted by Gorard, Siddiqui, and See (2015), the students' ability to produce questions, ask questions, and think through the thoughts and ideas of others is consistent with our research.

A question was prepared about how philosophy education affects the reasoning skills of experimental group students, and four sub-questions were formed within the scope of this question. In the first of these questions, the students were asked, "What are your thoughts on developing the sense of questioning and curiosity of these applications made in elective courses?" question has been asked. In most of the answers given by the students, they stated that their thoughts developed better, their self-confidence improved, their sense of curiosity increased, especially thanks to the books they read, and they became more curious about everything. As a matter of fact, in the study conducted by Reznitskaya and Glina (2013) on the effectiveness of dialogue teaching, it was concluded that students studying philosophy participate more in discussions and like to express this more when they have different opinions. Based on this information, it can be concluded that philosophy education increases students' self-confidence. The studies conducted by Gasparatou and Kampeza (2012) and Yeşilyurt-Çetin (2021) regarding the fact that philosophy education develops students' sense of inquiry and curiosity and develops their mathematical thinking skills are also supportive. In addition, as a result of these studies, it has been observed that children's sense of questioning develops, and their skills such as justifying their ideas, making judgments, and expressing opinions increase.

Ask the students, "What do you think about the philosophy books you have read within the scope of this application that will give you a different perspective in solving mathematical problems?" On the other hand, they stated that the students generally improved their processing skills, the meaning relationship in the questions was better understood, and they discovered different solutions. Marashi (2009) found that philosophy education with children improves reasoning skills among male students as a result of his study examining the effect of philosophy education on students' reasoning power. Similarly, Sare, Luik, and Tulviste (2016) examined the effect of the philosophy for children program on the verbal reasoning skills of preschool children. As a result of the research, an increase was observed in the students in the experimental group in their reasoning, verbal reasoning,

justification and inference skills. Apart from this, Ghaedi, Mahdian, and Fomani (2015) stated in a similar study that students developed their ability to gain a different perspective and produce original ideas. It can be said that the books read about philosophy improve the relationship of meaning in students, give students a different perspective and develop solutions.

Prepared for this sub-problem, "What are your thoughts on whether this application is helpful in solving the problems you encounter in your daily life?" Experimental group students stated that their sense of empathy developed, they understood family, friends and the events around them better, they used the information they learned in solving their daily problems, and they were able to produce better solutions for problems. Parallel to these results, the studies of Daniel, Lafortune, Pallascio, Splitter, Slade and Garza (2005) and Overton (1993) are supportive. In his study examining the effect of teaching thinking skills on academic achievement, Overton concluded that teaching thinking skills significantly increased academic achievement in the fields of language and mathematics. In addition, Dirican (2018) observed that there was an increase in students' ability to make predictions, justify their thoughts, express different opinions, be tolerant, be curious about what's going on around them, and ask questions. It can be said that philosophy education helps students in solving the problems they encounter in their daily life and in family, environment and friendship relations.

Finally, the students were asked, "What can you say about this subject when we consider the benefits of these applications within the scope of mathematics?" On the other hand, they stated that their understanding capacity increased in the solution of mathematical problems, their ability to go into detail improved, they increased the speed of problem solving and improved their reasoning skills. They also emphasized that they understood better the cause-effect relationship in mathematics questions. Similar to these data, Gorard, Siddiqui, and See, (2015) obtained similar results in a study in which philosophy education aimed to improve children's reasoning, social skills and general academic performance. In addition, as a result of the research, the skills of producing questions, asking questions, and thinking over the thoughts and ideas of others have developed. Although the study did not aim to increase the mathematics and literacy levels, it is another result that the mathematics achievement of the students increased. Overton (1993), in her study examining the effect of teaching thinking skills on academic achievement, concluded that teaching thinking skills significantly increased academic achievement in the fields of language and mathematics. These studies support the data obtained.

4.2 Suggestions

In this section, the suggestions developed for the findings are gathered under two headings as suggestions for practitioners and researchers.

4.3 Recommendations for Researchers

1. In this study, the effect of philosophy education on mathematics achievement was examined. In future studies, the success of philosophy education on other branches can be evaluated.
2. The effect of philosophy education on academic achievement can be examined for students at high school or university level.
3. Philosophy education can be compared with other learning styles.
4. The effect of philosophy education on students' attitudes towards the lesson can be examined.
5. Data on the effect of philosophy education on academic achievement can also be made with only qualitative data.

4.4 Recommendations for Practitioners

1. The first of the positive effects of philosophy education on mathematics achievement is the discussion on the concepts related to philosophy for children. Therefore, teachers can benefit from philosophy education to increase the success of students in both mathematics and other branches.
2. Philosophy education can be given to teachers so that teachers can guide students and benefit more from philosophy.

3. Even if the subjects of the philosophy course remain abstract for primary school students, the content of this course can be reduced to the level of the students under the name of the basic rules of philosophy and can be taught as a course.
4. In parallel with the course of the lesson, teachers can contribute to the development of students' reasoning skills by discussing the basic concepts in philosophy with the students before the lesson.

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The Effects of Language Exposure, Linguistic Distance, and Demographic Variables on Gagauz Students' Turkish Listening Skills

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Abstract

This quantitative research examined the variables affecting the Turkish listening skills of high school students living in Moldova-Gagauzia. It was evaluated effects of language exposure, linguistic distance, demographic variables (gender, settlement type, mother tongue, and Turkish language level) on participants' Turkish listening skills. 148 participants were students at Süleyman Demirel Moldo-Turkish High School in Kongaz. The data were collected using two instruments: The Turkish language exposure scale and listening tests. The scale was developed by Çobanoğlu Aktan and İnan (2020) to determine Turkish language learners' out-of-school exposure to Turkish. Listening test was developed based on Yunus Emre Institute's "Yedi İklim Türkçe Öğretim Seti". Afterward, the listening test results were analyzed to determine the variables that predicted listening performance. The research results indicated a low level of Turkish exposure among the participants. Females were exposed to Turkish more. There was no relationship between their listening test performance and exposure, mostly including Turkish visual and auditory media. In addition, in the Turkish listening exam, it was seen that the native speakers of Gagauz were more advantageous than Russian. The reason why the A1-2 level participants were more successful in the listening skill test might be the linguistic proximity and similarities of basic vocabulary between Turkish and Gagauz. It was concluded that linguistic distance was a stronger predictor than other variables.

Keywords: Language Exposure, Linguistic Distance, Listening Skills, Turkish as a Foreign Language, Gagauz Learners

1. Introduction

The recent improvements in tools and opportunities for learning a foreign language have offered new ways of learning and teaching and led to the abandonment of traditional foreign language teaching methods characterized by limited classes, repetition, and imitation. A student-centered approach to learning has allowed more space to practice and experience, thanks to out-of-classroom activities. Such an approach to foreign language teaching highlights the importance of the term "acquisition," indicating that students can acquire the target language just as how they learn their native language. In this sense, the Natural Approach to language acquisition emerged from the practices of Terrell (1977) and was developed by Krashen (1987).

According to Krashen and Terrell (1988), the most notable shortcoming of previous approaches and methods was that they ignored the language acquisition process and focused on language structure. Krashen and Terrell (1988) proposed five hypotheses in language acquisition theory: Acquisition-learning distinction, natural order, monitor model, comprehensible input, and affective filter assumption. Comprehensible input has a special place among all assumptions as inputs are the linguistic components necessary for learners to acquire a language. Inputs emerge from many resources such as teachers and students, communication tools, visual materials, and out-of-classroom environment. A person acquires a language thanks to comprehensible and repetitive exposure. Therefore, language exposure is a means of getting input (Bialystok, 1978; Littlewood, 1986; Long, 1980, 1985).

1.1. Foreign Language Exposure

The primary principle of exposure relies on students' receiving linguistic inputs continuously and thus acquiring a language instead of learning a language in limited hours of in-class education. Therefore, out-of-school activities are essential for language exposure in everyday life. Most people do not have the opportunity to spend time in the target language environment or talk to native speakers, which urges students to create an environment that would provide exposure to a target language or materials/inputs. At this point, teachers can play a leading role. Benson (2001) defines out-of-school language exposure as self-learning in a natural order. For example, learners can improve their vocabulary by engaging in a foreign language at leisure (Webb, 2015). In the literature, out-of-school exposure activities are listed as watching movies, TV series/shows, and videos, playing computer games, and listening to songs (e.g., De Wilde, Brysbaert & Eyckmans, 2020; González-Fernández & Schmitt, 2015; Kuppens, 2010; Lindgren & Muñoz, 2013; Muñoz, 2011, 2014; Peters, 2018; Sundqvist & Sylvén, 2014). Printed or electronic materials are less preferred for out-of-school language activities (Peters, Noreillie, Heylen, Bulte & Desmet, 2019).

Language skills are acquired by generalizing, transferring, imitating, and simplifying the language structures. In this sense, repetition of the same inputs through the mentioned processes is critical. Re-exposure to a language at regular intervals is beneficial, especially receptive language skills such as listening that help learners receive and use linguistic inputs and develop other language skills (Vandergrift & Goh, 2012). Considering the variety of visual and auditory media, today's culture industry presents several listening inputs in a target language.

The positive effects of television and visual tools on understanding what is heard are still discussed. Larsen-Freeman (2003) pointed out that television would help alleviate the pressure on students. Brinton and Gaskill (1978) also predicted that television and radio news would help improve listening skills. Poon (1992) observed the significant effects of television news on listening skills. In the 2000s, the development of several technological tools and the spread of fast internet connections made it easier for people to access videos, movies, and TV series/shows. Thus, watching television has become a comprehensive resource for active participation in the content of the broadcast, as well as the audio and visual inputs it provides. Recent studies have focused on the way of watching television in the 21st century.

Web (2015) indicates that watching television meets comprehensible input needs in learning foreign languages. Watching shows with subtitles positively affects learners' language development (e.g., Kuppens, 2010; Lindgren & Muñoz, 2013; Peters, 2018; Sundqvist & Sylvén, 2014). Especially in skill development, Lindgren and Muñoz (2013) found that watching movies with subtitles better-predicted students' reading and listening proficiency than many other out-of-school language exposure opportunities. Kuppens (2010) revealed that language exposure through television was more effective on female students than male students. He also concluded that television enhanced vocabulary better than computer games. Peters, Heynen, and Puimege (2016) found that subtitled programs promoted vocabulary learning. Additionally, they emphasized that visual and audio broadcasts in the target language, even without subtitles, contribute to language acquisition.

Some studies show that watching television in the target language improves listening skills (Mehrpour & Rahimi, 2010). Suárez and Gesa (2019) concluded that watching videos helped students retrieve the newly-listened words. Bahrani and Sim (2015) showed that news videos had latent language input and improved intermediate students' comprehension skills. Neuman and Koskinen (1992) indicated that the input from television should activate the cognitive process and draw attention to select and monitor the target content carefully.

In addition to television and audiovisual broadcasts, foreign language learners listen to songs in the target language. Music is acknowledged to have a stimulating and engaging role in improving listening skills (Khaghaninejad & Fahandejsaadi, 2016). Studies on the positive effects of listening to songs on language development yield different results. For example, according to Peters (2018), the effect of listening to songs in the target language- as a source of exposure- is negligible. On the other hand, Lindgren and Muñoz (2013) found a positive relationship between listening to songs and students' reading and listening skills. Pavia, Webb, and Faez (2019) also explored the effects of repeatedly listening to a particular song, namely the frequency of exposure, on target vocabulary acquisition and learning outcomes. They found that listening to songs contributed to vocabulary learning, repeated listening positively affected vocabulary acquisition, and frequent exposure to songs in the target language improved listening skills. Nimani and Dagarin (2019) showed that listening to songs in the target language as an extracurricular activity positively affected vocabulary and listening comprehension. However, they could not find a relationship between improved listening skills and non-musical content. Gönülal (2020) found results suggesting that podcasting and vodcasting technology improved listening skills. However, he asserted that improved listening skills could not be explained only by out-of-classroom systematic exposure to a target language.

Electronic devices and online activities also have the potential for out-of-school language exposure the (e.g., De Wilde, Brysbaert & Eyckmans, 2020; Lindgren & Muñoz, 2013; Peters, 2018; Sundqvist & Wikström, 2015; Sundqvist & Sylvén, 2014). Such activities depend on receiving language inputs through social media, computer games, or websites. Lindgren and Muñoz (2013) concluded that inputs from computer games and electronic devices significantly predicted listening proficiency. However, the effects of computer games and electronic devices are less slight than those of watching television and listening to songs. Similarly, Kuppens (2010) found that watching television affected students' vocabulary more than playing computer games. Peters (2018) stressed that language exposure through computer games was inversely proportional to age. Accordingly, high school students received more input from computer games than university students. Sundqvist and Wikström (2015) determined that males played computer games more often than females, which was linked to increased vocabulary knowledge in males. Females, on the other hand, spend more time on social media. Therefore, no relationship was found between computer activities and vocabulary knowledge in females.

There are also contradictory findings regarding students' out-of-school reading habits. Reading is a critical activity to enrich vocabulary and improve comprehension skills. Vocabulary learned through reading also affects listening comprehension. Webb and Chang (2015) determined that comprehensive reading activities have the potential to improve language skills, especially for advanced students. Peters (2018) found that although 16 and 19-year-old students rarely read books and magazines in their target language out of school, there was a positive relationship between reading and language development. Out-of-school reading activity in the target language is less preferred in younger age groups. Therefore, early reading activities provide less input (Lindgren & Muñoz, 2013; Sundqvist & Sylvén, 2012). Therefore, it can be predicted that the reading input would be higher in university-level students.

1.2. Linguistic Distance and Mother Tongue

Languages are similar in genetics, typology, semantics, and lexigraphy. In language teaching, linguistic distance is addressed with the advantages of the similarity between a target language and native language for learners (Corder, 1978). In this sense, those who learn similar languages are expected to be more successful than those who speak languages with less affinity. Ringbom (1987) found that Finnish-Swedish bilingual students primarily benefited from Swedish vocabulary and functions in writing an English text. Similarly, Cenoz (2001) concluded that people who knew Spanish-Basque made a semantic transfer from Spanish while learning English. Beenstock, Chiswick, and Repetto (2001) also indicated that the Jewish immigrants in Israel whose mother tongue was Arabic were more proficient in Hebrew than other immigrant groups, which stemmed from the affinity between Arabic and Hebrew. According to d'Ydewalle and Van de Poel (1999), Dutch students were more successful in the Danish vocabulary exam than French. In their research with students from several European countries, Lindgren and Muñoz (2013) examined the effects of linguistic distance and exposure on foreign language comprehension and concluded that linguistic distance was a stronger predictor than exposure.

Çobanoğlu Aktan and İnan (2017) observed that being a native speaker of a Turkic language positively and strongly predicted Turkish proficiency. It similarly predicted the Turkish exam performance of the people living in the Balkans, Middle East, and Central Asian countries. In addition to linguistic distance, cultural proximity is also influential in exposure to a language in this context. Linguistic kinship sometimes supports cultural proximity, characterized by an inclination to prefer content in the target language. It also promotes much exposure to the target language. Turkish TV series/shows have gained popularity in the Balkans, the Middle East, and Central Asia due to their geographical and cultural proximity. Arbatlı and Kurar (2015) found that in Kazakhstan, a multinational country, especially Turkic communities watched Turkish TV series/shows and concluded that it contributed to cultural interaction and the spread of Turkish. Arık and Çelik (2019) also determined that Turkish media positively contributed to learning Turkish in Kyrgyzstan. Similarly, Aktürk and Yağbasan (2020) concluded that Turkish TV series contributed to the spread of Turkish in Azerbaijan. In the case of Gagauzia, Kurt (2017) found that individuals who can speak Gagauz and have bonds with Turkey and Turkish culture are competent in Turkish.

1.3. Gagauzia and Gagauz Language

Gagauz is classified within the Oghuz Turkish branch of Turkic languages as Turkish and Azerbaijani (Doerfer, 1959). Because of interactions with Slavic languages for centuries, Gagauz differed from Turkish with some typological features (Johanson, 2020). It has copied the Slavic language forms in terms of syntactic. Lexically, it has many Russian loan words and Bulgarian and Romanian (Menz, 2006). The Gagauz language is spoken in various places in the Balkan peninsula, mainly in Gagauzia ATU (Autonomous Territorial Unit) in the Republic of Moldova. Gagauz language is considered an endangered language by UNESCO (Moseley, 2010). Although the Gagauz language is one of the official languages in Gagauzia, the dominance of Russian language and culture can be observed among the people living in the region.

1.4. Aim and Research Questions

Above, we mentioned the importance of exposure to the target language by presenting examples from the relevant literature and exemplified the effects of out-of-school exposure experiences through virtual and social media, audio and visual media, and social communication elements on foreign language development. This study aimed to investigate the effects of age, gender, linguistic distance, and especially language exposure on listening test performance. The research questions are listed as follows:

1. What is the participants' Turkish language exposure scores?
2. Is there a statistically significant difference between the participants' exposure and particular variables (e.g., gender, settlement type, language level, mother tongue)?
3. Is there a relationship between the participants' listening test performance and Turkish language exposure?
4. What is the predictive power of the given variables (e.g., gender, settlement type, language level, mother tongue) in listening test performance?

2. Method

2.1. Research Model

It was quantitative research, which examined Turkish language learners' listening performance in terms of language exposure, linguistic distance, and demographic variables, and both singular and relational survey models were employed. Singular survey models are preferred to determine variables separately by type or quantity (Creswell, 2013). Relational survey models show the presence or degree of change between two or more variables. In this sense, we used the relational survey model to reveal the factors behind participants' success in listening tests and the singular survey model to show their exposure to the Turkish language.

2.2. Participants

Participants were 148 individuals living in the Gagauzia Autonomous Region of the Republic of Moldova. All participants were students at Süleyman Demirel Moldo-Turkish High School in the Kongaz village of Gagauzia. It is one of the international high schools in Moldova. The languages of instruction were Turkish, Russian, and English. Each class received a 4-hour Turkish lesson weekly.

Table 1: Demographic characteristics of the participants

Gender	N	%
Female	94	36.5
Male	54	63.5
Mother Tongue	N	%
Gagauz	87	58.8
Russian	61	41.2
Language Level	N	%
A1	47	31.8
A2	35	23.6
B1	32	21.6
B2	34	23.0
Settlement Type	N	%
City	35	23.6
Village	113	76.4
Total	148	100

Table 1 shows the demographic characteristics of the participants. Accordingly, 94 (63.5%) participants were female, and 54 (36.5%) were male. 87 (58.8%) were Gagauz speakers, and 61 (41.2%) were Russian speakers. In terms of Turkish proficiency, the number of A1 learners was 47 (31.8%), A2 was 35 (23.6%), B1 was 32 (21.6%), and B2 was 34 (23%). Of them, 35 (23.6%) lived in the city, and 113 (76.4%) lived in the village.

2.3. Data Collection Tools

The data were collected using two instruments: The Turkish language exposure scale and listening tests. The scale was developed by Çobanoğlu Aktan and İnan (2020) to determine Turkish language learners' out-of-school exposure to Turkish. The five-point Likert type had 17 items and three factors: "speech and social interaction," "audio and visual media," and "virtual and social media." It explained 51.545% of the total variance. The first factor explained 34.553% of the total variance, the second factor 8.585% of the total variance, and the third factor explained 8.407% of the total variance. The Cronbach Alpha internal consistency coefficient was 0.633, 0.759, and 0.820 for each factor, respectively. The Turkish listening skill test was prepared considering language proficiency levels (e.g., A1, A2, B1). The test comprised three parts and fifteen items at all levels, including multiple-choice, fill-in-the-blank, and sentence completion. The test was developed based on Yunus Emre Institute's "Yedi İklim Türkçe Öğretim Seti" which was the primary course material for the participants.

2.4. Data Analysis

Statistical analysis was carried out using SPSS. The scale scores were subjected to descriptive analysis. The kurtosis value of the data was 1.23. Since it was between $-2 < x < +2$, the data had a normal distribution (George & Mallery, 2010). Then, parametric tests of t-Test and ANOVA were used to analyze the scale scores according to gender, settlement type, mother tongue, and Turkish language level. Whether the data met the homogeneity of variance assumption for ANOVA was checked by performing the Levene's Test. Pearson correlation coefficient was calculated for the correlation between the Turkish Language Exposure Scale scores and listening skill test scores. Regression analysis was conducted to specify the variables that predicted the listening test performance.

3. Findings

3.1. Findings Regarding the Participants' Turkish Language Exposure

The Turkish Language Exposure Scale responses were evaluated to determine the participants' exposure to Turkish. The total scores and the descriptive statistics are shown in Table 2.

Table 2: Descriptive Data on Total Scale and Factor Scores

	N	\bar{X}	Sd	Min.	Max.
Turkish Language Exposure Scale	148	35.00	10.9	18	81
Speech and social interaction	148	9.36	2.66	4	19
Audio and visual media	148	11.90	4.57	5	25
Virtual and social media	148	13.70	5.56	8	40

As seen in Table 2 that the mean total scores indicated a moderate exposure to the Turkish language (\bar{X} =35.00). Since the highest score obtained from the scale was 85, the exposure rate was 41%, suggesting medium and low levels of exposure. The factor with the highest mean score was "virtual and social media" (\bar{X} =13.70), followed by "audio and visual media" (\bar{X} =11.90) and "speech and social interaction" with the lowest mean score (\bar{X} =9.36). The items with the highest and lowest response rates provide more detailed information about participants' exposure to Turkish. Descriptive statistics about the items are presented in Table 3 below.

Table 3: Items with the highest and lowest mean scores

Item	Items with the highest mean scores	\bar{X}	Median	Sd
3	My classmates speak Turkish.	2.91	3.00	.88
8	I watch Turkish TV series/shows.	2.87	3.00	1.27
7	I listen to Turkish songs.	2.86	3.00	1.13
Item	Items with the lowest mean scores	\bar{X}	Median	Sd
14	I read Turkish comics.	1.34	1.00	.72
15	I play computer games in Turkish.	1.44	1.00	.86
16	I use a Turkish computer program.	1.44	1.00	.89

Table 3 shows the descriptive statistical analyzes of the scale items with the highest and lowest mean values. Accordingly, the items with the highest mean score ranged between "rarely" (2) and "sometimes" (3) on the Likert scale. The item "My classmates speak Turkish" had a higher mean than other items (\bar{X} =2.91), which was followed by the items "I watch Turkish TV series/shows." (\bar{X} =2.87) and "I listen to Turkish songs." (\bar{X} =2.86). The items with the lowest mean value were marked "never" (1) and "sometimes" (2). The item "I read Turkish comics." had the lowest mean score (\bar{X} =1.34), which was followed by the items "I play computer games in Turkish." (\bar{X} =1.44) and "I use a Turkish computer program." (\bar{X} =1.44). It can be indicated that the exposure sources, albeit at a low level, were daily conversations, TV series/shows, and songs in their immediate environment. However, the input rate of cartoons, computer games, and programs was low.

3.2. An Assessment of Turkish Exposure by Gender, Settlement Type, Mother Tongue, and Language Level

Whether particular variables such as gender, settlement type, mother tongue, and Turkish language levels affected participants' exposure to the Turkish language was examined in the study. First of all, independent samples t-test was performed to show the effects of gender. The t-test results are shown in Table 4 below.

Table 4: T-Test Results by Gender

	Group	N	\bar{X}	Sd	df	t	p
Turkish Language Exposure Scale	Female	94	36.77	9.73	146	-2.69	.00*
	Male	54	31.83	11.25			
Speech and social interaction	Female	94	8.78	2.31	146	-2.05	.04*
	Male	54	9.70	2.80			
Audio and visual media	Female	94	13.15	3.78	146	-4.66	.00*
	Male	54	9.74	4.54			
Virtual and social media	Female	94	13.31	5.43	146	-.63	.52

Male 54 13.91 5.65

*p<0.05

According to the analysis results in Table 4, the Turkish language exposure differed statistically significantly by gender ($t=-2.69$, $p<0.05$). Female participants ($\bar{X}=36.77$) were exposed to Turkish more than male participants ($\bar{X}=31.83$). Besides, there was a significant difference in the “speech and social interaction” factor by gender ($t=-2.05$, $p<0.05$), suggesting that males ($\bar{X}=9.70$) were exposed to Turkish via virtual and social media more than females ($\bar{X}=8.78$). A similar difference was also observed in the “audio and visual media” factor ($t=-4.66$, $p<0.05$), implying that females ($\bar{X}=13.15$) were exposed to the Turkish language via audio and visual media more than males ($\bar{X}=9.74$). “Virtual and social media” factor also differed statistically significantly by gender ($t=-0.63$, $p>0.05$). Accordingly, the mean scores of males ($\bar{X}=13.91$) were partly the same as females' ($\bar{X}=13.31$).

Whether the place where the participants live showed a significant difference in exposure level was checked by performing independent samples t-tests on scale and factors. The test results are given in Table 5.

Table 5: T-Test Results by Settlement Type

	Group	N	\bar{X}	Sd	df	t	p
Turkish Language Exposure Scale	City	35	36.63	15.14	146	1.02	.30
	Village	113	34.45	9.30			
Speech and social interaction	City	35	9.86	3.29	146	1.25	.21
	Village	113	9.21	2.43			
Audio and visual media	City	35	12.31	5.62	146	.60	.54
	Village	113	11.78	4.22			
Virtual and social media	City	35	14.46	8.19	146	.92	.35
	Village	113	13.46	4.47			

*p<0.05

As understood from Table 5, whether the participants lived in a city or a village did not make a statistically significant difference in their Turkish exposure ($t=1.02$, $p>0.05$). However, the participants living in the city ($\bar{X}=36.63$) had a higher mean score than those living in the village ($\bar{X}=34.45$). When we addressed the factors, we found that the “speech and social interaction” factor did not differ statistically significantly by settlement place ($t=1.25$, $p>0.05$). The mean scores of city dwellers in this factor ($\bar{X}=9.86$) were partly the same as those in the village ($\bar{X}=9.21$). The “audio and visual media” factor similarly did not differ by settlement type ($t=0.60$, $p>0.05$). The mean scores of those living in the city ($\bar{X}=12.31$) were higher than those living in the village ($\bar{X}=11.78$). Lastly, the scores did not significantly differ in the “virtual and social media” factor ($t=0.92$, $p>0.05$). Accordingly, the mean scale factor scores of those living in the city ($\bar{X}=14.46$) were higher than those living in the village ($\bar{X}=13.46$).

We performed independent samples t-test to determine whether the mother tongue variable showed a significant difference in exposure. The test results are presented in Table 6.

Table 6: T-Test Results by Mother Tongue

	Group	N	\bar{X}	Sd	df	t	p
Turkish Language Exposure Scale	Gagauz	87	34.84	10.45	146	-.16	.86
	Russian	61	35.15	11.71			
Speech and social interaction	Gagauz	87	9.25	2.83	146	-.61	.54
	Russian	61	9.52	2.41			
Audio and visual media	Gagauz	87	12.09	4.40	146	.59	.56
	Russian	61	11.64	4.83			
Virtual and social media	Gagauz	87	13.49	5.16	146	-.51	.60
	Russian	61	13.98	6.12			

*p<0.05

The results regarding the mother tongue variable and exposure level are given in Table 6. Accordingly, the mother tongue variable did not significantly differ in Turkish language exposure ($t=-0.16$, $p>0.05$). The mean scores of Gagauz speakers ($\bar{X}=34.84$) were lower than those of Russian ($\bar{X}=35.15$), indicating that Russian speakers were exposed to Turkish more than Gagauz speakers. Besides, the mother tongue variable did not make a significant difference in the “virtual and social media” factor ($t=-0.61$, $p>0.05$). The mean scores of the Gagauz speakers in the “speech and social interaction” factor ($\bar{X}=9.25$) were lower than those of Russian speakers ($\bar{X}=9.52$). We similarly did not find a significant difference in the “audio and visual media” factor by language variable ($t=-0.56$, $p>0.05$). However, the mean scores of Gagauz speakers in this factor ($\bar{X}=12.09$) were higher than those of Russian speakers ($\bar{X}=11.64$). The mother tongue variable did not significantly differ in the “virtual and social media” factor ($t=-0.51$, $p>0.05$). In this sub-dimension, the mean scores of Gagauz ($\bar{X}=13.49$) and Russian speakers ($\bar{X}=13.98$) were partially the same.

Table 7: Levene's Test Results by Language Level

Dimensions	Levene's Test	
	F	p
Turkish Language Exposure Scale	.16	.92
Speech and social interaction	1.16	.32
Audio and visual media	.49	.68
Virtual and social media	.56	.64

As seen in Table 7, there were homogenous distributions of the variances in the scale (Levene's $F=0.16$) and the factors of “speech and social interaction” (Levene's $F=1.16$), “audio and visual media” (Levene's $F=0.49$), and “virtual and social media” (Levene's $F=0.56$) ($p>0.05$). since the homogeneity was ensured, ANOVA, a parametric test, was performed. The results are shown in Table 8.

Table 8: ANOVA Results by Turkish Language Level

			Category	N	\bar{X}	Sd	F	p
Turkish Language Exposure Scale			A1	47	36.21	10.97	1.14	.33
			A2	35	36.77	11.49		
			B1	32	33.28	9.31		
			B2	34	32.97	11.67		
Speech and social interaction			A1	47	9.00	2.56	1.48	.22
			A2	35	10.03	2.73		
			B1	32	8.91	2.20		
			B2	34	9.62	3.04		
Audio and visual media			A1	47	12.49	4.34	.53	.65
			A2	35	12.09	4.43		
			B1	32	11.38	4.55		
			B2	34	11.41	5.12		
Virtual and social media			A1	47	14.72	5.75	2.27	.08
			A2	35	14.66	6.12		
			B1	32	13.00	4.73		
			B2	34	11.94	5.07		

* $p<0.05$

According to Table 8, participants' Turkish language levels did not make a statistically significant difference in their exposure levels ($F=1.14$, $p>0.05$). There was not a statistically significant difference in the factors of “speech and social interaction” ($F=1.48$, $p>0.05$), “audio and visual media” ($F=0.53$, $p>0.05$), and “virtual and social media” ($F=2.27$, $p>0.05$) by their Turkish language level. The total scale mean scores were higher among A1 ($\bar{X}=36.21$) and A2 ($\bar{X}=36.77$) learners than others. In this sense, A1 and A2 level participants were more exposed to the Turkish language than those at B1 and B2 levels. A2 level participants ($\bar{X}=10.03$) were more exposed to

Turkish through speech and social interaction. The participants most exposed to the Turkish language through audio and visual media ($\bar{X}=12.49$) and virtual and social media ($\bar{X}=14.72$) were the A1 level learners.

3.3. The Relationship between Turkish Language Exposure and Listening Skill Test Scores and the Predictive Power of Other Variables

The relationship between Turkish language exposure and listening skill was also dealt with within the scope of the research. The descriptive statistics regarding participants' scores in the Turkish listening test are given in Table 9.

Table 9: Listening Skills Test Scores

Gender	N	\bar{X}	Sd
Female	94	12.30	3.01
Male	54	12.00	3.05
Settlement	N	\bar{X}	Sd
City	35	11.10	3.79
Village	113	12.50	2.67
Mother Tongue	N	\bar{X}	Sd
Gagauz	87	13.00	2.38
Russian	61	11.10	3.47
Level	N	\bar{X}	Sd
A1	47	14.04	1.89
A2	35	12.60	1.90
B1	32	9.69	3.57
B2	34	11.65	2.92

Table 9 shows participants' scores in the listening tests. The participants were generally successful in the 15-point listening test. The mean test scores of female ($\bar{X}=12.30$) and male participants ($\bar{X}=12.00$) were almost the same. In terms of settlement type, those living in the village ($\bar{X}=12.50$) had a higher mean score than those in the city ($\bar{X}=11.10$). The mean score of Gagauz speakers ($\bar{X}=13.00$) was higher than Russian speakers ($\bar{X}=11.10$). Lastly, the A1 level learners obtained the highest mean score in the listening test ($\bar{X}=14.04$).

The Pearson correlation coefficient between the total Turkish Exposure Scale scores and the listening test scores was calculated to examine the relationship between exposure level and listening test performance. The analysis results indicated a low positive correlation between Turkish language exposure and listening test success ($r=0.030$). However, it was not statistically significant ($p>0.05$). Then, the predictive power of the mother tongue in the listening test performance was examined, and Table 10 shows the regression analysis results.

Table 10: Regression Analysis Results Regarding the Listening Test Performance

Variables	B	Std. Error	β	t	p
Listening Score	15.762	1.462	-	10.784	.000
(Constant)					
Gender	-.128	.452	-.020	-.283	.778
Settlement	.926	.515	.131	1.800	.074
Level	-1.014	.188	-.388	-5.401	.000*
Language	-1.831	.439	-.299	-4.168	.000*
R=.524	$R^2=.254$				
F=13.526	p=.000				

*p<0.05

As seen in Table 10, the multiple regression analysis results showed that the participants' mother tongue, together with the Turkish language level variable, significantly predicted the listening test success ($R=0.524$ and $R^2=0.254$) ($F=13.526$, $p<0.05$). The given variables explained approximately 25% of the variance in listening test success.

According to the standardized regression coefficients, language level ($\beta=-5.401$) was the biggest predictor, followed by mother tongue ($\beta=-4.168$). Considering the t-test results regarding the significance of the regression coefficients, language, and mother tongue were significant predictors of listening test success, indicating an inverse relationship between the Turkish language level and listening test performance. Additionally, Gagauz speakers had better test performance than Russian speakers.

4. Discussion and Conclusion

With the development of education and communication technologies in language teaching, the alternatives to access to a target language have increased. It is not likely to speak of foreign language teaching just limited to in-class time and reinforced with homework assignments. Today, anyone with internet access can access target language materials and contents. In this sense, exposure to a foreign language has become easier than in the past. It is possible to develop language skills thanks to meaningful language inputs, including audio, visual, and written sources. Therefore, it becomes essential to investigate students' exposure to foreign languages. This research examined Turkish learners' exposure profiles and their reflections on listening skills.

Within the scope of the research, firstly, participants' Turkish language exposure was determined by administering the Turkish language exposure scale. The participant responses indicated a low level of out-of-school Turkish language exposure. The most basic input source for the participants comprised 4-hours of Turkish classes weekly and communication with the Turkish teacher. Specifically, the low means scores from the "speech and social interaction" factor prove that the participants were not in a Turkish-speaking environment except the school environment. However, some participants stated that they communicated with their classmates in Turkish. Virtual and social media events are also popular input sources for participants. Accordingly, Turkish websites, social media accounts, and Youtube videos are important in terms of providing Turkish input. In this respect, our findings align with the research of De Wilde, Brysbaert & Eyckmans (2020), which emphasizes the significance of online interaction. However, the lowest mean scores were obtained from the items related to computer games and programs, which were not among the leading input sources for the participants. It does not overlap with the findings of Peters (2018), who indicated that high school students received more input from computer games. It might stem from the limited social and economic opportunities the participants living in Gagauzia had. On the contrary, accessing audio and visual media content in Gagauzia is easier. For example, Turkish series/shows, movies, and songs are accessible alternatives for anyone with a television and radio at home. Similarly, Kuppens (2010) highlights that media contents are more effective for language exposure than computer games. Even among the scale items, watching Turkish TV series and listening to songs were more popular than other activities, which aligns with the studies emphasizing that exposure to television content was more prevalent than many other out-of-school activities (e.g., Kuppens, 2010; Lindgren & Muñoz, 2013; Nimani & Dagarin, 2019; Peters, 2018; Sundqvist & Sylvén, 2014). Additionally, it was concluded that the exposure to the Turkish language through reading activities was low. The items with the lowest mean scores were related to reading activities. Reading in the target language is a less preferred activity (Lindgren & Muñoz, 2013; Peters, 2018; Sylvén & Sundqvist, 2012). In the study, we examined whether gender, settlement type, mother tongue, and Turkish level affected language exposure and found that gender variables affected Turkish exposure. Females were more exposed to Turkish than males. Nevertheless, males were exposed to Turkish more than females in social environments where Turkish was spoken. Females were exposed to Turkish more than males through audio and visual media such as Turkish movies and TV series, which aligns with our findings. Television is a more effective input tool for female students than male students (Kuppens, 2010; Sundqvist & Wikström, 2015). We found that both genders were equally exposed to virtual and social media, which is a different finding. For example, Sundqvist and Wikström (2015) concluded that females were more exposed to a target language through social media than males.

Settlements differ in terms of education, social environment, and technical opportunities. Living in cities can sometimes be more advantageous in resource access than living in villages (United Nations Development Program, 2020). Considering this fact, we examined the relationship between participants' exposure to the Turkish language and where they lived but did not find a statistically significant difference between those living in a city and a village. However, the average scores suggest that those living in the city might be luckier to access Turkish language content.

The linguistic kinship between Gagauz and Turkish refers that Gagauz speakers have the opportunity to be exposed to the Turkish language frequently because some studies emphasize that the main motivations of those who follow the Turkish media in Turkic republics are cultural and linguistic proximity (e.g., Arbatlı & Kurar, 2015; Arık & Çelik, 2019; Aktürk & Yağbasan, 2020). However, our findings show that being a Gagauz or Russian speaker does not change Turkish exposure.

No statistically significant difference was found in the effects of Turkish language level on Turkish exposure. The A1 and A2 level participants were more exposed to the Turkish language than the advanced participants. B2 is acknowledged as the highest level of Turkish proficiency, and the group with the lowest exposure rate was the B2 level participants. In this sense, our findings show the opposite.

Language exposure is considered an effective tool for providing meaningful input. Thus, we aimed to describe the relationship between Turkish language exposure and listening skill performance. The participants got an average of 12 points out of a 15-point listening skills test, which suggests high success. The Gagauz speakers and the A1 level participants were more successful than the other groups. However, we could not find a statistically significant relationship between listening test performance and Turkish language exposure. In other words, participants' exposure to Turkish and listening skills did not contribute to test performance. These findings are inconsistent with the literature, indicating that language exposure partially improves language skills. For instance, Lindgren and Muñoz (2013) found that language exposure positively predicted reading and listening skills. Similarly, Bahrani and Tam (2015) concluded that videos improved listening comprehension skills. There are also studies underlying the limited effect of exposure on skill development. For example, Nimani and Dagarin (2019) found no significant relationship between non-musical radio broadcasts and language exposure. Gönülal (2020) reported that exposure reinforced listening skills, but it could not explain the whole process.

It can be inferred that the low-level exposure does not provide input for Turkish listening skills. The participants were successful in the Turkish listening test despite insufficient exposure, which cannot be explained only by the effect of exposure. Other factors may have an impact as well. Therefore, we attempted to reveal the factors that might be influential on listening skills except for exposure. The regression analysis results showed that gender or settlement type did not predict listening skill test success. However, mother tongue and Turkish language levels predicted listening skill performance.

According to the findings, a native speaker of Gagauz was more successful than a native speaker of Russian, which results from the linguistic affinity between Gagauz and Turkish. This result aligns with the studies examining the effects of linguistic distance (e.g., Beenstock, Chiswick & Repetto, 2001; Cenoz, 2001; d'Ydewalle & Van de Poel, 1999). Lindgren and Muñoz (2013) found that linguistic affinity was a stronger predictor of listening test performance than factors such as exposure. Gagauz is in the Oghuz group of Turkish and Turkic languages, but it is also influenced by Slavic languages in terms of syntax and vocabulary (Menz, 2006). The linguistic distance between Russian, an Indo-European language, and Turkish is greater than Gagauz.

Findings indicate that the language level negatively predicted listening skills. As participants' Turkish levels increase, they become less proficient in listening. In this sense, the A1 level participants performed better in the listening test than at the B2 level, which parallels Kurt's findings (2017). In their research on the Turkish language skills of Gagauz students, the A1 level learners got higher scores in the listening skill test, which might stem from the similarity in the A1 and A2 level basic vocabulary between Turkish and Gagauz.

Turkish and Gagauz are similar in terms of everyday language vocabulary. The A1 and A2 basic levels of Turkish contain several daily words. As the language level increases, social, scientific, and academic words are added to the vocabulary. However, Turkish and Gagauz differ in terms of vocabulary related to other fields except for everyday life. According to Tekin (1978), it significantly reduces the mutual intelligibility between Gagauz and Turkish. In this sense, it is thought that as the language level increases, Gagauz becomes less advantageous in learning Turkish. It can be said that the students cannot maintain their success in learning Turkish as they improve in language learning.

All these results do not refuse the importance of language exposure as a booster in language learning. However, this paper confirms that other variables apart from language exposure can contribute to listening test scores. Future studies should aim to account for especially linguistic distance in order to explain foreign language achievement.

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The Relationship between Teachers' Motivation and Organizational Commitment: The Mediating Role of Perceived Principal Management Style

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Abstract

In this study, it is aimed to examine the mediating role of school principals' management styles in the relationship between teachers' motivation and organizational commitment. In the study, teachers working at all levels of education in public schools in the city center of Isparta in the 2021/2022 academic year constitute the universe. Simple random sampling method was preferred in the selection of the study group and data were collected from 962 teachers who volunteered. At the end of the extreme values, normality and multiple normality controls in the data set, 933 teachers were determined as the study group of the research. The perceived principal management style scale developed by Üstüner (2016), the organizational commitment scale for teachers developed by Üstüner (2009) and the adult motivation scale developed by Tulunay Ateş and İhtiyaroğlu (2019) were used as data collection tools in the research. The model established regarding the mediating role of management style in the relationship between teachers' motivation and organizational commitment was tested with the structural equation model. The demographic information, reliability coefficients and correlation values between the variables of the research participants were analyzed by SPSS 22, and the structural equation modeling was analyzed by LISREL 8.80. According to the research findings, relations between teachers' motivation, organizational commitment and perceived principal management style were determined. In addition, according to another finding of the research, the perceived principal management style has a partial mediating role in the relationship between teachers' motivation and organizational commitment. According to these findings, it can be interpreted that the effect of school principals' management style should be taken into account in increasing teachers' motivation and organizational commitment.

Keywords: Motivation, Organizational Commitment, Perceived Principal Management Style, Structural Equity Modeling, Mediation Role

1. Introduction

The Based on the information revealed by neoclassical theory; It can be said that the labor and productivity of the employees are affected by their emotions, thoughts and behaviors and related factors. Among these factors that

affect employees, there are also concepts such as commitment and motivation. As the motivation and organizational commitment of organization members and the relationship between them are important for the organization, they are the subjects that are included in many books written in the field of organization and management (Balay, 2014; Eren, 2012; Özkalp & Kırel, 2016 ve Sabuncuoğlu & Vergiliel Tüz, 2013) and researched (Cemaloğlu, 2002; Coladarci, 1995; Dogani, 2010; Hiriyappa, 2018; Karadaş, 2012; Karaköse & Kocabaş, 2006; Liou, 2008; Riehl & Sipple, 1996; Terzi & Kurt, 2005; Tulunay, Ateş & İhtiyaroğlu, 2019; Üstüner, 2016; Yazıcı, 2009; Yılmaz, 2009; Yıldız, 2013). Karadaş, Teke and Demir (2011) state that the motivation and organizational commitment of organization members in organizations should be increased for achieving the aims of the organization. With this perspective, It can be interpreted that the relationship between motivation and organizational commitment in organizations is very important. In other words, the behavior of the managers is effective in the job satisfaction of the organization members (Erdil et al., 2004) and the level of alienation from work (Şimşek et al., 2006). The fact that managerial behaviors can affect employees from different aspects suggests that they may also affect motivation and commitment.

The concept of commitment is expressed as individuals' feeling a high degree of responsibility towards something, an institution, an idea that they consider more important than themselves (Ergun, 1975). The concept of organizational commitment, which was first investigated by White in 1956, has been discussed by different researchers over time (Gül, 2002; Gül, 2014). Researchers who dealt with organizational commitment in the following years revealed in their studies that this concept is not a single dimension but also a concept that includes different dimensions. For example; Meyer and Allen define the concept of organizational commitment in the dimensions of affective, continuance and normative commitment; Mowday behavioral and attitudinal commitment dimensions; Etzioni moral, calculating and alienating dimensions of commitment; Kanter in the dimensions of continuance, unity and control commitment; Chatman and O'Really discussed internalization, adaptation and identification under the dimensions of commitment (Demirel, 2020). Porter et al. (1974) described by three factors organizational commitment as strong belief and acceptance of the organization's goals and values, the willingness to exert effort on behalf of the organization and a firm desire to continue membership in the organization.

Employees' commitment to the organization is important in all organizations, as well as a vital situation in schools located at the center of the education system (Karayılan, 2021). Since teachers are at the center of communication with both administrators and students in educational organizations, teachers' commitment to the school is of great importance (Celep, Bülbül & Tunç, 2000). Because, in order for teachers to work effectively and willingly, they are expected to develop a commitment to the school as well as their commitment to their profession and students. For this reason, it is necessary to eliminate all factors that negatively affect teachers' commitment levels (Yıldız, 2013). In this way, it is stated that the effectiveness of schools will increase thanks to teachers whose organizational commitment levels will increase (Elliot & Crosswell, 2003; Web, Metha & Jordan, 1992). Because it is stated that teachers with high organizational commitment are more effective in increasing student achievement due to being more interested in their students, while teachers with low organizational commitment have a negative impact on student success because they are less tolerant and less understanding towards their students (Balay, 2014; Riehl & Sipple, 1996) Considering that school success is measured by student success, it is stated that teachers with high organizational commitment will increase the success of the institution by raising more successful students (Karadaş, 2013) and will be ready to serve the school well (Bogler & Somech, 2004).

Dannetta (2002) states that teacher commitment has three dimensions.

- 1) Organizational commitment can be described as belief and acceptance of organizational goals and values, willingness to exert effort on behalf of the organization and the desire to stay in the organization (Mowday, Steers & Porter, 1982).
- 2) Commitment to the teaching profession; It is the degree to which a person has a positive, emotional commitment to his or her job (Coladarci, 1992).
- 3) Commitment to students' learning; It is about how committed teachers are to their students' learning, regardless of other issues that may be relevant (for example, academic difficulties, social background) (Kushman, 1992).

When the three dimensions mentioned above are carefully examined, it can be interpreted that organizational commitment is very important for teachers and that teachers with high organizational commitment will exhibit positive behaviors for the school, students and themselves.

There can be many factors that affect the motivation of individuals about a subject (Çetinkaya, 2018). For example, Ağca (2014) mentions that school administrators' management style and practices are highly effective in teachers' organizational commitment. Another factor that affects organizational commitment is motivation. Because it is stated that the organizational commitment of employees with low motivation is also low (Sarıkaya, 2016). For this reason, it would be useful to examine the relationship between organizational commitment and motivation in detail.

Hiriyappa (2018) argues that the concept of motivation is difficult to understand and define. Therefore, it is natural to have different definitions of motivation. For example; This concept, which is reproduced from the word “movere”, stands for activating in Latin, means activating individuals for organizational purposes within the organization (Tanrıöğen, 2018). In addition to, Kanfer (1990) describes motivation as the direction of person's effort level and a psychological process that enables one to cope with these obstacles in the face of obstacles. Therefore, it can be interpreted that the main source of initiating, directing and maintaining human behaviors is motivation (Çetinkaya, 2018). According to Keser (2006), motivation; It consists of three basic components: activating the impulses that exist in the nature of the individual and directing his behavior through environmental factors, evaluating the behavior in line with the goal to be achieved and maintaining the behavior in order to reach the goal by the individual.

Motivation can emerge as a result of internal and external sources (Robbins, 1999). Intrinsic motivation is based on an innate tendency to interact effectively with one's environment and make sense of one's own world (White, 1959). For this reason, in intrinsic motivation, the individual performs the behavior voluntarily for his own good, and the source of motivation is actually performing that job, that is, the behavior itself (Hackman & Oldham, 1976). Individuals who are motivated by external factors perform the behavior to obtain material or social awards or to refrain recompense. For this reason, the source of motivation is not the behavior itself, but the consequences of the behavior (Robbins, 1999).

The main reason why individuals who are both internally and externally motivated in organizations are motivated is the benefit they derive from organizations (Robbins, 1999). In return for the benefit it provides to the members of the organization, it obtains inputs such as time, effort, experience, knowledge and skills of the members of the organization (Jones, George & Hill, 1999). As a result of the mutual benefits among the organization and the member, the members of the organization are motivated internally in situations such as autonomy, responsibility, success and enjoyment of work while they are externally motivated in situations such as wages, job security, employee benefits and rest times (Robbins, 1999). Consequently, it is important to try to grasp what motivates individuals internally and externally (Dogani, 2010). For this reason, It can be said that motivating the members of the organization well and determining their motivation sources correctly are some of the most important duties of principals in organizations (Karaman, 2010).

Some peculiarities of the motivation process can be mentioned. For example; Yıldırım (2006) lists the characteristics specific to motivation as follows.

- What motivates people may differ from person to person.
- Whether the motivation process is successful or not can only be possible with good observation of human behavior.
- When a need is motivated and satisfied, new sources of motivation are needed.
- Although it is difficult for managers to control the motivation of individuals, it may be possible to influence the motivation process.
- People can be motivated without even realizing it.

Motivation is very important for productivity and success in schools, as in organizations outside the school (Herzberg, 2003). Because the teachers are at the center of this organization (Bursalioglu, 1987) and because teachers have a significant role in the learning process as an example to students (Farid, 2011), the concept of

motivation can be expected to be even more important in schools. Although many teachers try to give their best for their students, there are many factors that prevent teachers from being motivated in the school environment (Darling-Hammond, 1999). On the other hand, organizational members who are motivated in the organization; It can be said that motivating teachers is important in terms of increasing teacher productivity since they will show responsible, organizational and self-directed behaviors (Vaughan, 2005).

Motivation is very important in terms of teachers' duties and responsibilities (Cemaloğlu, 2002). Similarly, Sarı, Arıanoğlu, and Cananoğulları (2018) state that teachers with high motivation will tend to take more responsibility. While a significant relation exists among teachers' motivations with their job satisfaction and work performance, highly motivated teachers also have a positive effect on student achievement (Yılmaz, 2009). Although teachers motivation is a combination of internal and external motivation levels at different rates, it is expected from teachers to fulfill their duties with internal motivation (Yazıcı, 2009). Because a high level of intrinsic motivation brings success (Lin, McKeachie & Kim, 2003). On the other hand, it is stated that teachers with low motivation levels may experience some negative situations and stress level is one of them (Pithers & Fogarty, 1995).

On the other hand, one of the important issues on motivation and organizational commitment is the management manner applied by the principals (Omidifar, 2013). Because the management attitude applied by the managers; It has an impact on teachers' motivation (Ada, et al., 2013) and organizational commitment (Ağca, 2014). Each manager may prefer a different management approach. In this case, the rate of motivating teachers may also change (Sarı, Arıanoğlu & Cananoğulları, 2018). The management styles adopted by the managers have been classified in different ways by some authors. For example; While Terzi and Kurt (2005) discuss the management styles of managers in three dimensions as "democratic", "authoritarian" and "indifferent"; In the "Perceived Manager Management Style Scale" improved by Üstüner (2016), four dimensions are considered as "cooperative-democratic", "authoritarian", "disinterested" and "oppositional" management styles. Since the "Perceived Manager Management Style Scale" improved by Üstüner (2016) was used in the current study, it was preferred to examine this classification.

Cooperative-democratic management approach

According to this management approach, the school administrator encourages teachers to work with the administrators while including them in the decision-making process by getting help from the teachers when necessary (Sarı, Arıanoğlu & Yalçın, 2014). In addition, administrators who adopt the cooperative-democratic management style try to develop cooperation between teachers, appreciate teachers and expect them to follow new developments (Üstüner, 2016).

Authoritarian management approach

In this management approach, administrators make teachers feel that there is a power difference between them and expect teachers to be aware of this (Sarı, Arıanoğlu & Yalçın, 2014). Üstüner (2016) states that administrators of this style are strict and intolerant, do not take teachers into account when participating in decision-making, and act too formally towards teachers.

Disinterested management approach.

School principals who adopt this management style do not give importance to the relationships between stakeholders at school, the feelings of the teachers, the problems of the school and the success of the school. They almost leave school alone (Sarı, Arıanoğlu & Yalçın, 2014). In addition, school principals who adopt this style also exhibit behaviors of constantly delaying the solutions of problems and being unfair among employees (Üstüner, 2016).

Resistive management approach

Managers in this style prefer to complicate problems instead of solving them, and they do not like breaking the rules and disrupting the routine (Üstüner, 2016). In addition, they do not support the work done by the teachers and try to prevent these studies (Sarı, Arıanoğlu & Yalçın, 2014).

Which attitude the administrators will choose depends on their personality traits (Ergin, 2008). In addition to the personality traits of the managers, the personnel profile they work with, the structure of the organization, the characteristics of the organization, the nature of the work done and the time constraints can also affect the management attitude that the managers will apply (Üstüner, 2016). Therefore, the attitude of the manager, which is affected by many factors and is clearly defined separately from each other as stated in the above headings, may sometimes change. With another expression, a manager can exhibit more than one and different attitudes together or separately, depending on the situation.

Although there are many studies that affect teacher motivation at school, the most important factor affecting teacher motivation is the attitude of the administrator (Eyal & Roth, 2011). In addition, Sun (2004) states that the management styles applied by the administrators are also effective in the organizational commitment of the teachers. It may be important to examine the relationships between these concepts because the management styles that principals applied have an impact on teachers' motivation and their organizational commitment. For this reason, it is intended to investigate whether the school principals' management style has a mediating role in the relationship between teachers' organizational commitment and motivation.

2. Methodology

This study is a descriptive study, one of the relational screening models, aiming to examine whether school principals' management style has a mediating role in the relationship between teachers' motivation and organizational commitment.

In this study, model 1 and model 2, in which the relationships between variables will be tested, are given in figure 1.

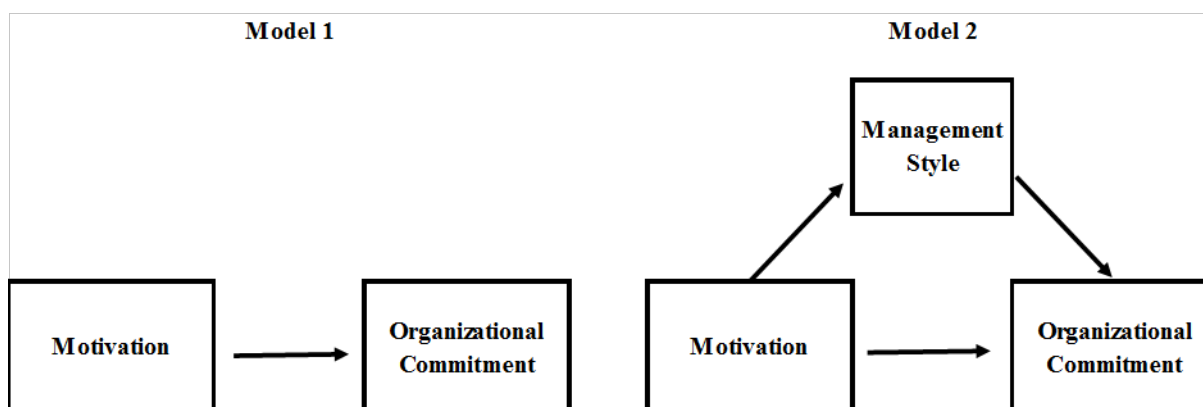


Figure 1: Research Models

As seen in Figure 1, while the relationship between teachers' motivation and teachers' organizational commitment was examined in Model 1, the mediating role of managerial attitude in the relationship among teachers' motivation and organizational commitment was investigated in Model 2.

2.1 The Study Group

The research group consists of teachers at all levels working in public schools in the center of Isparta in the 2021/2022 academic year. Data were collected from teachers who volunteered to participate in the study by using simple random sampling method in selecting the participants. In the first stage, data were collected from 962 teachers, but after the extreme data, normality and multiple normality checks the data that did not provide the normality and multiple normality assumptions were removed and 933 participants were determined as the final study group of the study. Demographic information of the study group is given in the findings section.

2.2 Data Collection Tools

2.2.1 Perceived Principal Management Style Scale

The scale, which aims to measure school principals' management styles according to teachers' perceptions, was improved by Üstüner (2016). The scale consists of 25 items in total, 7 items in the dimension of "cooperative" management style, 7 items in the dimension of "authoritarian" management style, 7 items in the dimension of "indifferent" management style, and 4 items in the dimension of "oppositional" management style. Scale items are graded as 5-point Likert-type (1) "never", (5) "always". In the 1st dimension, a maximum of 35, a minimum of 7 points, a maximum of 35, a minimum of 7 points in the 2nd dimension, a maximum of 35, a minimum of 7 points in the 3rd dimension, and a maximum of 20 and a minimum of 4 points in the 4th dimension can be obtained from the scale. The Cronbach's Alpha values related to the reliability of the scale are cooperative .92, authoritarian .89, irrelevant .86 and oppositional .85. In this study, Cronbach's Alpha values were found to be cooperative .96, authoritarian .87, irrelevant .78 and oppositional .84 in the reliability analyzes of the scale

2.2.2 Organizational Commitment Scale for Teachers

The single-factor and 17-item scale was developed by Üstüner (2009) to measure teachers' organizational commitment. The scale is in the form of a 5-point Likert scale and has a rating of (1) "never" and (5) "always". The Cronbach's Alpha internal reliability coefficient of the scale was determined as .96. In this study, Cronbach's Alpha value was found to be .97 in the reliability analysis of the scale.

2.2.3 Adult Motivation Scale

The scale improved by Tulunay Ateş and İhtiyaroğlu (2019) consists of 2 dimensions and a total of 21 items, 13 items in the "intrinsic motivation" dimension and 8 items in the "extrinsic motivation" dimension. The scale items are in a 5-point Likert type and are graded as (1) "strongly disagree" and (5) "strongly agree". The score that can be obtained from the scale is a minimum of 21 and a maximum of 105. The Cronbach Alpha reliability coefficient for the reliability of the scale was calculated as 0.94. In this study, the Cronbach Alpha reliability coefficient for "intrinsic motivation" was calculated as 0.89 and the reliability coefficient for "extrinsic motivation" was calculated as 0.72.

2.3 Data analysis

When analyzing data, some steps mentioned below were followed in order to determine whether the assumptions required for structural equation modeling were met. First, missing data was checked and three data were cleared from the data set. In addition, Mahalanobis distances of the data were calculated in order to calculate the multivariate extreme values. As a result, data that did not have multivariate outliers were excepted from the data set. At the end of the all these procedures, skewness and kurtosis values were examined with the data of the remaining 933 participants for testing the normal distribution. These values were found to be between -1.5 and +1.5. According to this, it can be said that the data exhibit a normal distribution (Tabachnick & Fidell, 2013). SPSS 22.00 for descriptive statistical values and LISREL 8.80 for confirmatory factor analysis and structural equation modeling were used in the research.

3. Results

The demographic information of the teachers who constituted the study group of the research are given in Table 1.

Table 1: Demographic Information of Teachers

		f	%
Gender	Male	399	42,8
	Female	534	57,2
	Total	933	100
Teaching Level	Pre-School	72	7,7
	Primary School	217	23,3
	Secondary School	250	26,8
	High School	393	42,1
	Total	933	100
Operation Time	1-3 years	382	40,9
	4-6 years	224	24
	7-9 years	131	14
	10-13 years	102	10,9
	14 years and above	92	9,9
	Total	933	100
Seniority	1-10 years	206	22,3
	11-20 years	382	40,3
	21-30 years	276	29,8
	31-40 years	69	7,6
	Total	933	100

When Table 1 is examined, it is seen that 42.8% (n:399) of the teachers participating in the research are male and 57.2% (n:534) are female. In addition, 7.7% (n:72) of the participants are preschool teachers, 23.3% (n:217) are primary school teachers, 26.8% (n:250) are secondary school teachers and 42.1% (n:393) are high school teachers. In addition, when the working time of the participants at their school is examined, it is determined that 40.9% (n:382) is between 1-3 years, 24% (n:224) is between 4-6 years, 14% (n:131) is 7 -9 years, 10.9% (n:102) is 10-13 years and 9.9% (n:92) is 14 years or more. Finally, It is seen that they have 22.3% (n:206) of the participants were between 1-10 years, 40.3% (n:382) between 11-20 years, 29.3% (n:276) between 21-30 years and 7.6% (n:69) between 31-40 years professional seniority.

Before the structural equation modeling analysis; In the scale of teachers' organizational commitment, consisting of a total of 17 items and one dimension, 2 parcels were created by using the item parceling method. It is aimed to benefit from the advantages (Süral-Özer, Eriş, & Timurcanday-Özmen, 2012) of using one-dimensional variables together with the item parceling method to provide more model fit to be an alternative to the weaknesses of factor analysis and to be used in organizational and psychological research. After the exploratory factor analysis, the items of the scale were according to their factor loads; Those with the lowest and highest factor loads were divided into two parcels. Thus, 2 latent variables, 1 observed in the organizational commitment scale for teachers, were obtained. Pearson Product-Moment Correlation Analysis was carried out in order to reveal the relationships between teachers' organizational commitment, motivation and perceived principal attitude. The correlation, mean and standard deviation values between the variables are given in Table 2.

Table 2: Correlation, Mean and Standard Deviation Values between Variables

Variable	X	Sd	1	2	3	4	5	6	7	8
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1.C.M.S	4,07	0,98	1							
2.A.M.S	2,16	0,93	-.57**	1						
3.D.M.S	1,59	0,65	-.61**	.39**	1					
4.O.P.S	1,69	0,88	-.67**	.58**	.67**	1				
5. O.C.1	3,84	0,96	.78**	-.44**	-,53**	-.56**	1			
6. O.C.2	3,8	1,02	.81**	-.49**	-.54**	-,57**	.918**	1		
7. I.M.	4,62	0,36	.17**	-,10**	-.07**	-.06	.241**	.239**	1	
8. E.M.	4,24	0,47	.16**	-.05	-.05	-.02	.233**	.215**	.560**	1

*p<.05, **p<.01

C.M.S: Collaborative management style, **A.M.S:** Authoritarian management style, **D.M.S:** Disinterested management style, **O.P.S:** Opposing management style, **O.C.1:** Organizational commitment Plot 1, **O.C.2:** Organizational commitment 2. Plot, **I.M:** Intrinsic motivation, **E.M:** Extrinsic motivation

When Table 2 is examined, a highly positive and significant relationship ($r = .78$) was found between the 1st parcel of collaborative management hound and organizational commitment, A very high and positive correlation was found between the 2nd parcel of organizational commitment ($r = .81$) and a low level of positive correlation between intrinsic motivation ($r = .17$) and extrinsic motivation ($r = .16$). In addition, between the authoritarian management style and the 1st parcel of organizational commitment ($r = -.44$) moderately negative, between the 2nd parcel of organizational commitment ($r = -.49$) moderately negative and intrinsic motivation ($r = -.10$).) a low-level negative significant relationship was detected. Between the irrelevant management style and the 1st parcel of organizational commitment ($r = -.53$) moderately negative, between the 2nd parcel of organizational commitment ($r = -.54$) between moderately negative and intrinsic motivation ($r = -.07$) a low-level negative significant relationship was detected. Finally, a moderately negative significant relationship was found between the oppositional management style and the 1st parcel of organizational commitment ($r = -.56$), and a moderately negative significant relationship between the 2nd parcel of organizational commitment ($r = -.57$). The structural model of motivation and teachers' organizational commitment is shown in Figure 2.



Figure 2: Structural Model of Teachers' Motivation and Organizational Commitment Variable

In Figure 2, it is seen that there is a coefficient ($\beta=0.38$, $p<.01$) showing the relationship between teachers' motivation and organizational commitment. Standardized coefficients are interpreted as low when they are less than 0.10, medium when they are around 0.30, and large when they are 0.50 and above (Kline, 2005: 122). Therefore, it can be said that motivation has a moderate effect on teachers' organizational commitment. When the fit indices of the model are examined ($X^2= 210.76$; $sd = 71$; $X^2 /sd =2.96$; $RMSEA = 0.00$, $RMR = 0.00$; $CFI = 0.98$; $GFI = 0.98$; $NFI=0.97$; $AGFI = 0.98$) values are generally good. . After this process, the model was tested by adding management style as a mediating variable to the model between motivation and organizational commitment. The t values of the obtained model are given in Figure 3, and the mediation role analysis including standardized values is given in Figure 4.

In Figure 3, principal management style t values are given in the relationship between teachers' motivation and organizational commitment.

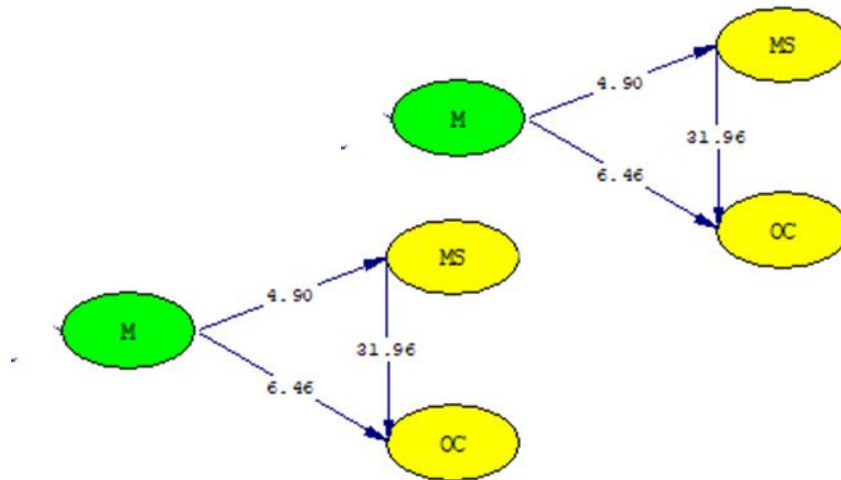


Figure 3: Principal Management Style t-values in the Relationship Between Teachers' Motivation and Organizational Commitment

Jöreskog and Sörbom (1993) state that the critical t value should be above 1.96 for .05 significance level and above 2.576 for .01 significance level. In other words, it can be said that the relations below 1.96 for .05 significance level and 2.57 for .01 significance level are meaningless (Şimşek, 2020). When Figure 3 is examined, it has been determined that $t=4.90 > 2.57$ for teachers' motivation and principal management style, $t=6.46 > 2.57$ for teachers' motivation and organizational commitment, and $t=31.96 > 2.57$ for principals' management style and teachers' organizational commitment. From this point of view, it can be said that there are significant relationships between teachers' motivation, organizational commitment and principal management style.

In Figure 4, the mediating role of the principal's management style in the relationship between teachers' motivation and their organizational commitment and the relations between the variables are given.

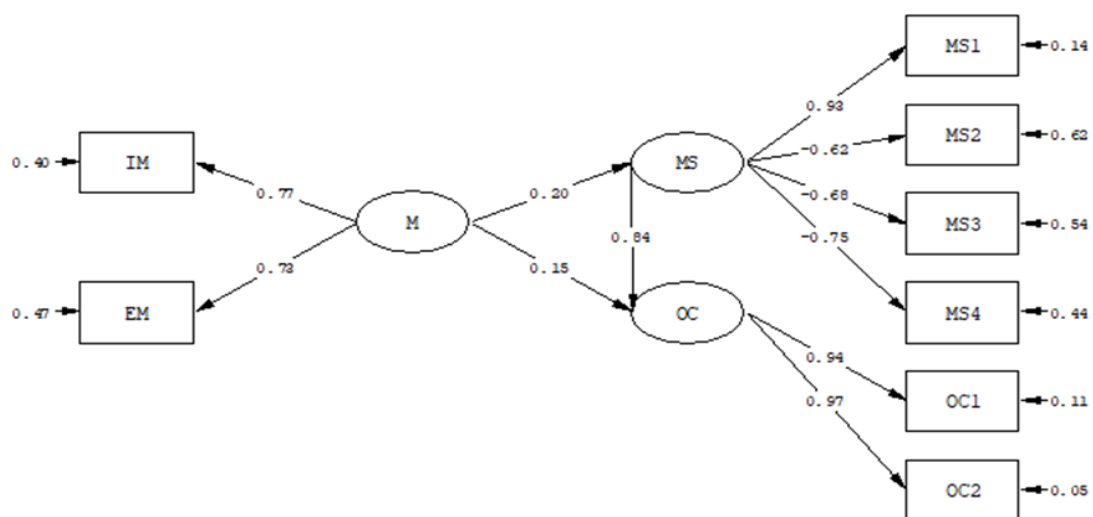


Figure 4: The Mediating Role of Principal Management Style in the Relationship between Teachers' Motivation and Organizational Commitment

When Figure 4 is investigated, it is clear that there are positive relationships among the three variables. One-way arrows in the figure show one-way linear relationship. Each arrow means a hypothesis and a path that will correspond to the regression coefficient (Şimşek, 2007). In line with this information, according to the model obtained, it can be paraphrased that the effect of teachers' motivation on their organizational commitment occurs

both directly and indirectly through the principal's management style. In addition, as the model is investigated, it is determined that the collaborative management style is positive; it is also determined that there is a negative relationship between authoritarian, disinterested and oppositional management styles.

In addition, as the structural model in Figure 2 is investigated, it is seen that the effect of motivation on organizational commitment ($\beta=0.38$, $p<0.001$) decreased in the mediator model ($\beta=0.15$, $p<0.001$) in Figure 4. This decrease can be interpreted as evidence of the mediating effect of the manager's management style between motivation and organizational commitment and as a partial mediation. When the goodness-of-fit values of the last model tested in the study are examined ($X^2 = 284.14$; $sd = 74$; $X^2 / sd = 3.83$; $RMSEA = 0.07$; $RMR = 0.03$; $CFI = 0.96$; $GFI = 0.94$; $NFI = 0.96$; $AGFI = 0.87$) was found to be at a good level and sufficient (Cokluk, Şekercioglu, & Büyüköztürk, 2012; Hu & Bentler, 1995; Kline, 2005).

4. Discussion

In this study, the mediating role of perceived principal management style in the relationship between teachers' motivation and their organizational commitment was examined. According to In accordance with the results of the correlation analysis and structural equation model made for this purpose; It has been determined that there is a moderate positive relationship between motivation and organizational commitment. As the literature is investigated, many studies examining the relationship between organizational commitment and motivation (Austen & Zacny, 2015; Bahrami et al., 2016; Canbaba, 2019; Ertürk, 2014; Fırat, 2012; Kalay, 2015; Mohan & Sharma, 2015; Oran, Bilir Güler) and Bilir, 2016; Özata and Topçu, 2018; Posey et al, 2015; Yılmaz, 2011; Yusein, 2013; Zeynel and Çarıkçı, 2015). On the other hand, many studies showing the significant and positive relationships between teachers' motivation and organizational commitment (Cansu, 2019; Ertürk, 2014; George & Sabapathy, 2014; Kalay, 2015; Oboko & Waswa, 2020; Tentama & Pranungsary, 2016; Uzunpınar, 2019) are available. As can be seen, the fact that the relationships between the organizational commitment and motivation of both employees and teachers are frequently studied by researchers can be explained by the importance of the relationship between motivation and organizational commitment. It is possible to confirm this important relationship with the finding of Johnson, Chang and Yang (2010) in their study that motivation is very important in increasing the organizational commitment of employees.

Another of the findings of this research is the relationship between teachers' motivation and perceived principal management style. There are some studies in the literature examining the relationships between teachers' motivations and perceived principal management style. For example, Abdurrezzak and Üstüner's (2020) finding that perceived management style is a significant predictor of teachers' intrinsic motivation is one of them. In addition, Sarı, Yıldız, and Canoğulları (2018) and Sun (2004) found significant relationships between perceived principal management style and teacher motivation, and Karataş (2020) found significant relationships between perceived principal management style and teachers' professional motivation. These relationships can be expected to vary according to perceived principal management styles. In the current study, it was determined that the internal and external motivations of the teachers had a positive effect on the collaborative management style, while it had a negative effect on the collaborative, authoritarian and oppositional management style. From this perspective, it can be interpreted that teachers who work with school principals who cooperate with teachers and adopt a management style that includes teachers in the decisions taken will be more motivated. On the other hand, considering that the collaborative management style has a positive effect on the school climate (Guzelgör, Demirtaş & Balı, 2021) and that the administrators with the collaborative management style also try to improve the cooperation between teachers and appreciate the teachers (Üstüner, 2016), It can be said that the collaborative management style will increase the working performance and their commitment to school of the teachers.

Finally, the mediating role of perceived principal management style in the relationship between motivation and organizational commitment was examined. When the fit indices of the obtained model were examined, it was seen that the values were generally high. According to the research findings, it is seen that teachers' motivations affect their organizational commitment both directly and indirectly through the perceived principal management style through partial mediation. This finding is a sign that the management styles of school principals' should be considered as an issue that should be considered in terms of teachers' motivation and organizational commitment.

Also the effect of the manager's management style should be taken into account in ensuring and increasing the organizational commitment of teachers.

Although this research is the first to investigate the impact of principals' management style on the relationship between teachers' motivation and organizational commitment in Turkey, it has some limitations. The research was executed only on teachers working in the city center of Isparta province. For this reason, it can be said that the generalizability is low. For this reason, more generalizable findings can be presented by conducting studies with larger samples in different provinces of Turkey.

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Investigation of Social Media Usage Status of Music Teacher Candidates

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Abstract

The progress societies take in progress becomes directly proportional to their adaptation to technology and their rapid catching up with change. In the computer age, all kinds of life layers of individuals are intertwined with technology. As a matter of fact, education, culture, health, social and all kinds of social life layers are being carried out through the internet, social networks and technological tools. While the Internet and social media have emerged as an alternative communication medium, they have emerged as an opportunity for individuals who have difficulty expressing themselves especially in the public sphere or in their social circles. Social networks, which provide opportunities for young people to make their voices heard, produce content, create networks by coming together with individuals who think like them, and increase their democratic participation by expressing their opinions on political and social issues, have also had positive effects in this context. This research was conducted to measure the social media usage purposes of music teacher candidates, and to determine whether their social media use purposes, situations and areas are related to social media use disorder or addiction. Social media usage scale were applied to the study group determined by the random assignment method within the scope of the research, and in the light of the data obtained, the social media usage status of the music teacher candidates was compared with the gender and individual instrument variables, and it was examined whether there was a significant difference between them

Keywords: Music Education, Music Teacher Candidates, Internet, Social Media

1. Introduction

Technological changes and developments are now taking place in all areas of daily life. The progress societies take in progress becomes directly proportional to their adaptation to technology and their rapid catching up with change. In the computer age, all kinds of life layers of individuals are intertwined with technology. As a matter of fact, education, culture, health, social and all kinds of social life layers are being carried out through the internet, social networks and technological tools. While the Internet and social media have emerged as an alternative communication medium, they have emerged as an opportunity for individuals who have difficulty expressing themselves especially in the public sphere or in their social circles. Social networks, which provide opportunities for young people to make their voices heard, produce content, create networks by coming together with individuals

who think like them, and increase their democratic participation by expressing their opinions on political and social issues, have also had positive effects in this context.

Today, with the rapid development of communication technologies and the internet, the reflections of technology on social, cultural and economic life are visibly felt. Communication technologies, which are seen as one of the driving dynamics of the rapid changes in society, have also changed the communication habits of the individual in their social life to a certain extent. With this transformative power, technology has begun to adapt individuals and even societies to itself. In other words, this mediated form of communication realized through technology has gradually become widespread in the society, and this has brought about changes in both individual and social communication practices (Aydın, 2016).

Many factors are effective in increasing the importance of social media in society. These factors; It is possible to list them as being easy to use, delivering the desired messages to large audiences quickly, being completely free, and offering two-way communication (Altunbaş and Kul 2015: 415). The effective role of computer and communication technologies in our lives is undeniable. Particularly, thanks to the internet, which is a revolutionary communication technology, instant sharing of different types of data such as videos, music and photos and access to information have become easier. The Internet has created a gigantic environment of computer networks that exist at the same time and everywhere, independent of the physical space and that will unite millions of people in the virtual world (Yılmazsoy and Kahraman, 2017).

Along with the change and development of life styles and technology, communication opportunities, ways of obtaining information, personal development process and content have changed. The social media environment created by the change in the media is a determining factor in the diversification of information, the spread of information, the form of information, access to information and internalization of information (Kamiloğlu and Yurttas, 2014: 132). According to Menteşe (2013: 13), in the twenty-first century, which is the age of information and technology, information technologies have affected the learning-teaching process, social, economic and cultural life. However, it has also changed the interpersonal interaction, especially the communication style of people, to different dimensions.

Generally; Although it is accepted that social media, which is defined as the set of tools and platforms that people use to share their thoughts, experiences, comprehension skills, perceptions, media such as music, video and photography with each other, has entered our lives in parallel with the development of internet technologies, it is actually seen that its use has become widespread in the 2000s and later (Lai and Turban, 2008). It can be thought of as the desire to eliminate the socialization that cannot be achieved or gained in real life in the virtual environment. The individual tries to socialize through e-mails, chat rooms, discussion forums and online games. An individual who wants to have social interaction via the Internet does not favor face-to-face interaction. The tendency of the individual to socialize or to find social support triggers the risk of internet addiction and the individual may move away from the society (Günüç & Kayri, 2010). Today, on social media sites, a large number of people use their real identity information. They can freely share and discuss a large number of different types of information and disseminate this process. Today, interaction on social networking sites is based on friendship, kinship, interests and activities. But this is not the only function of social networks. These networks consist of not only family and friends, but also teachers, school staff, neighbors, and different circles in the community. Social networks provide users with many opportunities such as creating and sharing information, establishing and developing relationships (Kwon & Wen, 2010).

Social media tools are rapidly diversifying and constantly evolving. This situation has made the use of social media tools in education increasingly important (Kocadere & Aşkar, 2013). The use of social media tools in education will also strengthen the communication between students and teachers. It is an undeniable fact that children born in the 21st century are constantly exposed to these tools from the moment they are born. According to Öztürk and Talas (2015), thanks to the worldwide spread of social media applications, people have gone far beyond communicating with people in the same neighborhood or in the same city. The ability of people to communicate with each other globally has started a new era (Güney, 2018). Today, interpersonal communication with internet-based applications is very common. Not only text messages, but also different kinds of messages appealing to many sense organs such as photographs, videos, and voices are communicated. Social media is very common in

these relationships established between people over the internet with a computer or mobile phone (Kırık, Pepeler, & Özbek, 2018).

With the Internet becoming an interactive world with Web 2.0, cooperation through social networks enables information sharing and production between educators and those who prepare the information (universities) (Strathdee, 2007) and is used to support education (Cited by Yılmazsoy and Kahraman, 2017). On the other hand, according to Cemaloğlu and Bıçak (2015), social networking sites, the use of which are becoming more and more widespread in the information age we live in, lead teachers and students, who are indispensable elements of schools, to an active participation in social networks and rapidly increase teacher-student interaction (Gül and Diken, 2018). One of the factors affecting the media literacy levels of teacher candidates is the purpose of using social networking sites. Social networking sites have become one of the ways of communication that people from all segments of society use intensively (Ulu and Baş, 2020). Social Media Agency has determined that individuals spend an average of two hours a day on social networks. The country that spends the most time is Argentina with 4.3 hours, and the country that spends the least time is Japan with 0.8 hours. Turkey has gained a place above the average with 2.5 hours (Dal and Dal, 2014).

When the literature is examined, it is seen that different scientific researches of academicians in this field are related to the effects of social media usage status, internet addiction status and social media usage status of university students and teacher candidates studying in different departments. Baş and Dikbaş (2020), Bilgici et al. (2016), Demir and Kumcagiz (2019), Erdem et al. (2017), Erol et al. (2021), Güler et al. (2019), Karasu and Arkan (2016), Koçer (2012), Özalp and Akpınar (2018), Rıdvan and Yıldırım (2016), Somyürek and Gün (2017), Tavşanlı and Akaydın (2017), Tekin and Erdoğan (2020), Varol and Yıldırım (2017) and Yayla (2018) carried out scientific researches related to the use of social media by pre-service teachers.

This research is aimed at “Does the social media usage status of music teacher candidates differ according to various variables?” structured around the research question. In the study, the social media usage status of the music teacher candidates was compared with the gender and individual instrument variables they were studying, and it was tried to reveal whether there were significant differences between the social media usage status and the variables. In the research, answers to the following sub-research questions were sought in the focus of the main research question;

1. What is the distribution of music teacher candidates' daily social media usage times and social media preferences?
2. How are the social media usage tools and purposes of music teacher candidates distributed?
3. Does the social media usage status of music teacher candidates differ according to their gender?
4. Does the social media usage status of music teacher candidates differ according to the individual instrument types they are studying?

This research was conducted to measure the social media usage purposes and social media addiction levels of music teacher candidates, and to determine whether their social media use purposes, situations and areas are related to social media use disorder or addiction. In the literature, the limited number of scientific studies on the use of social media by music teacher candidates is considered important in terms of revealing the social media literacy, use cases, aims and effects and contributions of music teacher candidates on their education, identifying the problems, if any, arising from the use of social media, and offering solutions.

This research is limited to;

1. With the fall and spring semesters of the 2021-2022 academic year,
2. With the music teacher candidates studying in the departments of fine arts education, music education program of the education faculties of the universities in the study group in the 2021-2022 academic year,
3. Music teacher candidates who are in the study group, who are studying in the relevant departments and who also use the internet and social media.

2. Method

2.1 Model of the Research

This research is a descriptive study using the relational screening model, which aims to examine the social media usage status of music teacher candidates. The research model that aims to determine the existence of change between two or more variables or the degree of this change is called the relational survey model (Karasar, 2017). In survey models, there are observations of science, detecting relationships between events, and reaching generalizations on controlled invariant relationships. In other words, the descriptive function of science is in the foreground (Yıldırım, 1966). Kaya (2012) explains that, in the descriptive-correlational survey model, a study determines a situation or event as it is and finds out relationships, effects, and degrees of the variables causing this situation or event. Gürbüz and Şahin (2017 p.108) state that the correlational survey model is used to determine the relationship between two or more variables and any significant differences in certain variables, and also announced that the causes of the relation are sought by using correlation, regression, and difference tests. A researcher working with the scanning model should not only directly examine what he is researching, but also consult the previously kept records about the researched thing, the resource people related to that field, and integrate his own observations with what he has obtained. Recording the events as they are in the scanning model is the most important feature. However, comments and evaluations are mandatory. The scanning model serves these two purposes (Yıldırım, 1966).

2.2 Research Assumptions

1. The participants were assumed to give sincere answers to the measurement tool used in the data collection within the research.
2. The music teacher candidates were assumed to participate in the study voluntarily and were in mental health to respond to the scale questions.

2.3 Study Group

The study group of the research consists of music teacher candidates who are studying in the fall and spring semesters of the 2021-2022 academic year in the department of fine arts education, affiliated to the education faculties of 6 universities, which are determined by the random assignment method, and who are also internet and social media users. Below is the demographic information of the music teacher candidates participating in the research in the relevant departments of the universities that make up the study group and in the relevant departments;

1. Muğla Sıtkı Koçman University, Faculty of Education, Department of Fine Arts Education, Music Education Program (Muğla)
2. Pamukkale University, Faculty of Education, Department of Fine Arts Education, Music Education Program (Denizli)
3. Cumhuriyet University, Faculty of Education, Department of Fine Arts Education, Music Education Program (Sivas)
4. Harran University, Faculty of Education, Department of Fine Arts Education, Music Education Program (Şanlıurfa)
5. Trabzon University, Faculty of Education, Department of Fine Arts Education, Music Education Program (Trabzon)
6. Trakya University, Faculty of Education, Department of Fine Arts Education, Music Education Program (Edirne)

The data on the gender of the music teacher candidates in the study group and the individual instruments they are studying are given in Tables 1 and 2.

Table 1: Distribution of the Music Teacher Candidates to whom the Scale was Applied by Gender

Gender	Frequency	Percentage
Male	73	35
Female	139	65

Total	212	100,0
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Looking at Table 1, 65% of the 212 music teacher candidates to whom the scale was applied are female and 35% male.

Table 2: Distribution of Music Teacher Candidates to whom the Scale was Applied by Individual Instrument Types

Individual Instrument	Frequency	Percentage
String Instruments	86	41,0
Wind Instruments	53	25,0
Clavier Instruments	46	22,0
Picks Instruments	27	12,0
Total	212	100,0

2.4 Data Collection Tools

The "Social media usage purposes scale" developed by Solmaz et al. (2013) was used as a data collection tool in the research. The social media usage scale, which was developed to determine the social media usage status of teacher candidates, consists of 11 items. The standardized loads of the scale were between 0.57 and 0.60, and the Cronbach's Alpha coefficient of the scale was found to be 0.703. In addition, the individual instruments and genders of 212 music teacher candidates, who were applied a scale to determine whether the social media usage status of the music teacher candidates differ according to the variables, were also collected through the personal data form. Before proceeding to the data collection process of the research, necessary ethical permissions were obtained from Muğla Sıtkı Koçman University Human Research Ethics Commission-2 with the report numbered 14 on 05.11.2021. After obtaining the necessary ethical permission, the data collection phase of the research was started. The data used within the scope of the research were collected face-to-face and via google form in the fall and spring semesters of the 2021-2022 academic year.

2.5 Analysis of Data

Research data were analyzed with SPSS 22 package program. Descriptive statistics were used for the first and second sub-research questions of the study. Independent sample t-test was used to determine the relationship between social media usage status of music teacher candidates and gender variables related to the third sub-research question of the study. One-Factor Analysis of Variance (ANOVA) was applied to determine the relationship between the social media usage status of music teacher candidates, which is the third sub-research question of the study, and the variables of individual instrument type they are studying.

3. Results

3.1 Results of the First Sub-Research Question

The first sub-research question of the study, "How is the distribution of music teacher candidates' daily social media usage times and social media preferences?" Findings related to the question are given below.

Table 3: Distribution of Music Teacher Candidates to whom the Scale was Applied on Daily Social Media Usage Periods

Daily Usage Time	Frequency	Percentage
Less than 1 Hour	12	05,7
1-1,5 Hours	27	12,7

2-2.5 Hours	51	24,5
3-3,5 Hours	54	25,0
4-4,5 Hours	23	10,8
More than 4.5 Hours	45	21,3
Total	212	100,0

According to Chart 3, 25% of the 212 music teacher candidates to whom the scale was applied use social media for an average of 3-3.5 hours a day, 24.5% of them for 2-2.5 hours, 21.3% of them used social media for more than 4,5 hours, 12.7 of them used social media for 1-1.5 hours, 10.8 of them 4-4.5 hours and 5.7 of them for less than 1 hour daily average finding has been reached. According to this; It can be said that the majority of the music teacher candidates to whom the scale was applied spend more than 2 hours a day on social media.

Table 4: Distribution of Preferred Social Media Platform of Music Teacher Candidates to Which Scale was Applied

Preferred Social Media Platform	Frequency	Percentage
Instagram	98	45,0
Twitter	45	22,0
Facebook	21	10,0
Tiktok	13	06,0
Youtube	28	14,0
Skype	07	03,0
Total	212	100,0

According to Chart 4 it has been found that 45% of the 212 music teacher candidates to whom the scale was applied preferred instagram as their social media platform, 22% twitter, 14% youtube, 10% facebook, 6% tik tok and 3% preferred the skype social media platform. According to this; It can be said that the most preferred social media platforms by the music teacher candidates to whom the scale was applied are Instagram, Twitter and YouTube.

3.2 Results of the Second Sub-Research Question

The first sub-research question of the study, "How is the distribution of music teacher candidates' daily social media usage times and social media preferences?" findings related to the question are given below.

Table 5: Distribution of Music Teacher Candidates to Which Scale was Applied on Social Media Usage Tools

Social Media Usage Tools	Frequency	Percentage
Mobil Phone	120	56,0
Tablet	43	20,0
Laptop	12	06,0
Desktop Computer	37	18,0
Total	212	100,0

When Table 5 was examined, it was found that 56% of 212 music teacher candidates, who applied the scale, preferred mobile phone as a social media usage tool, 20% preferred tablet, 18% preferred laptop and the remaining 6% preferred desktop computer. In the light of these findings, it was determined that more than half of the music

teacher candidates, who applied the scale, prefer mobile phone as a social media usage tool, although they also use computer and tablet as a social media usage and it can be said to have been selected that mobile phone is commonly used as a tool to usage social media.

Table 6: The Distribution of Music Teacher Candidates Regarding the Purposes of Social Media Use of the Scale

Social Media Usage Purposes	Frequency	Percentage
For Listen to Music	93	43,0
For Know to News	44	20,0
For Enjoy	27	14,0
For Follow the Trend	18	08,0
For Spend Time	30	15,0
Total	212	100,0

According to Chart 6, 43% of 212 music teacher candidates, who were applied scale, used social media for listening to music, 20% for know to news, 15% for spend time, 14% for enjoying and the remaining 8% for follow the trend. The data that they use social media to according to this, it can be said that the music teacher candidates, to whom the scale was applied, mainly use social media for listen to music, communicate and evaluate their spend time.

3.3 Results of the Third Sub-Research Question

The third sub-research question of the study, "Does the social media usage status of music teacher candidates differ according to their gender?" Findings related to the question are given below.

Table 7: Distribution of Social Media Usage Status of Music Teacher Candidates to whom the Scale was Applied by Gender Variable

Social Media Usage Scale	Gender	f	\bar{x}	ss	p
I use social media to communicate with friends	Male	73	3,44	,957	,361
	Female	139	3,57	,959	,362
I use social media for fun and relaxation	Male	73	2,63	,881	,039*
	Female	139	2,41	,913	,037*
I use social media to spend my free time	Male	73	3,24	,954	,230
	Female	139	3,41	,931	,234
I use social media to listen music	Male	73	3,56	1,117	,194
	Female	139	3,76	1,039	,205
I use social media to send and receive messages	Male	73	3,36	1,060	,154
	Female	139	3,58	1,013	,161
I use social media to get to know people better	Male	73	2,65	1,169	,019*
	Female	139	2,39	1,100	,016*
I use social media to follow events or trends	Male	73	4,00	,903	,154
	Female	139	3,81	,897	,155
I use social media for personal presentation and information sharing	Male	73	3,04	1,072	,386
	Female	139	2,91	,981	,399
I use social media to reach people and organizations	Male	73	3,13	,923	,430
	Female	139	3,02	,977	,422
I use social media to exchange ideas	Male	73	3,94	1,006	,618
	Female	139	3,96	1,103	,608
I use social media to access information	Male	73	2,47	,944	,015*
	Female	139	2,68	,992	,024*

* $p < ,05$

According to Table 7, when the averages of the social media usage scale sub-dimensions applied to the music teacher candidates were examined, it was found that social media was most frequently used to follow the events/agenda among the music teacher candidates, and that social media was mostly used for the exchange of ideas. On the contrary, it was found that music teacher candidates use social media to access information, to get to know people better, and to have fun and relax. When Table 7 is examined, according to the findings obtained from the independent sample t-test applied to determine whether the social media usage status of music teacher candidates differ according to gender, the gender of the music teacher candidates and the sub-dimension of using social media for fun and relaxation, and the sub-dimension of using social media to get to know people better. It has been found that there is a significant difference between the sub-dimensions of using social media for access to information. It can be said that according to findings, male music teacher candidates use social media more for fun and relaxation than female music teacher candidates, male music teacher candidates use social media more often than female music teacher candidates to get to know people better, female music teacher candidates use social media compared to male music teacher candidates.

3.4 Results on the Fourth Sub-Research Question

The fourth sub-research question of the study, "Does the social media usage status of music teacher candidates differ according to the individual instruments they are studying?" findings related to the question are given below.

Table 8: Distribution of Social Media Usage Status of Music Teacher Candidates to which Scale was Applied by Individual Instrument Variable

Social Media Usage Scale	Individual Ins.	f	\bar{x}	ss	p
I use social media to communicate with friends	Strings	83	3,25	,7112	,593
	Winds	51	3,26	1,165	,030*
	Claviers	48	2,93	,7054	,000*
	Picks	30	3,11	,8690	,001*
I use social media for fun and relaxation	Strings	83	3,60	,6578	,593
	Winds	51	3,07	,7591	,528
	Claviers	48	2,71	,9498	,002*
	Picks	30	3,24	1,035	,646
I use social media to spend my free time	Strings	83	3,13	,8719	,195
	Winds	51	2,74	,7163	,585
	Claviers	48	3,22	,9662	,038*
	Picks	30	3,49	1,065	,033*
I use social media to listen music	Strings	83	2,97	1,199	,530
	Winds	51	2,68	1,201	,197
	Claviers	48	2,93	1,032	,810
	Picks	30	3,22	1,094	,530
I use social media to send and receive messages	Strings	83	2,99	,9661	1,00
	Winds	51	3,31	1,134	,969
	Claviers	48	3,23	,8870	,009*
	Picks	30	3,54	,8703	1,00
I use social media to get to know people better	Strings	83	3,46	,8804	,782
	Winds	51	3,24	,7132	,013*
	Claviers	48	2,63	,7539	,769
	Picks	30	3,20	,8703	,981
I use social media to follow events or trends	Strings	83	2,20	,7869	1,00
	Winds	51	1,91	,6176	,609

	Claviers	48	1,84	,5514	,817
	Picks	30	2,03	,7799	1,00
I use social media for personal presentation and information sharing	Strings	83	3,65	,8325	,981
	Winds	51	3,86	,7647	,713
	Claviers	48	3,24	,8333	,969
	Picks	30	3,53	,8924	,981
I use social media to reach people and organizations	Strings	83	2,64	,9841	,003*
	Winds	51	2,76	,9581	,030*
	Claviers	48	2,35	,8255	,730
	Picks	30	2,74	,9837	,941
I use social media to exchange ideas	Strings	83	2,72	,7361	,013*
	Winds	51	2,78	,7546	,528
	Claviers	48	2,71	,7514	,002*
	Picks	30	2,76	,7789	,942
I use social media to access information	Strings	83	3,06	,8471	,023*
	Winds	51	3,10	,8723	,527
	Claviers	48	2,63	,7504	,063
	Picks	30	3,00	,8112	,033*

* p<,05

When Table 8 is examined, it has been found that the social media usage status of music teacher candidates differs according to the individual instrument types they are studying. The sub-dimensions of the social media usage scale were compared with the individual instrument types of 212 pre-service music teachers, and the data in table 8 were obtained. According to this; In the sub-dimension of using social media for communication with their friends, it was found that there was a significant difference between the individual instrument types of the music teacher candidates, to whom the scale was applied. It can be said that the music teacher candidates who receive wind, key and plectrum training apart from the string instruments group use social media mostly for communication with their friends compared to the music teacher candidates in the string instruments group. When the data of the sub-dimension of using social media to relax are examined, it can be said that the music teacher candidates in the key instruments group often use social media to relax, while the music teacher candidates studying in the string, wind and plectrum group rarely use social media to relax. It was found that there were significant differences between the sub-dimension of using social media to evaluate leisure time and the individual instrument types of music teacher candidates. It can be said that the music teacher candidates who are trained in the keyboard and plectrum instrument type often use social media for the purpose of evaluating their spare time, while the music teacher candidates in the string and wind instrument group rarely use social media for leisure. Again, a significant difference was determined between the sub-dimension of using social media for the purpose of sending or receiving messages and the variable of types of instruments. It can be said that they use the media to receive or send messages. Again, in the light of the data obtained from Table 8, it was determined that there were significant differences between the sub-dimension of using social media to get to know people better and the individual instrument variable. While music teacher candidates who are studying woodwind instruments mostly use social media to get to know people better, it can be said that music teacher candidates in the string, key and plectrum group rarely use social media to get to know people. Significant differences were found between the sub-dimension of using social media to reach people and organizations and the variable of instrument type. It can be said that while the music teacher candidates studying in the string and wind instrument type often use social media to reach people and organizations, it can be said that the music teacher candidates studying in the keyboard and plectrum type instrument rarely use social media to reach people and organizations. When the sub-dimension of using social media for the exchange of ideas is examined, it can be said that the music teacher candidates in the string instruments and key instruments group mostly use social media for the exchange of ideas, while the music teacher candidates in the wind instruments and plectrum group rarely use social media for the exchange of ideas. It was also found that there were differences between the last sub-dimension, the sub-dimension of using social media to access information, and the individual instrument variables of the music teacher candidates. Accordingly, it can be said that while the music teacher candidates in the string instruments and plectrum group use socially frequently

for access to information, the music teacher candidates in the wind instruments and key instrument group rarely use social media for access to information.

4. Discussion

In the light of the findings, most of the music teacher candidates spend more than 2 hours a day on social media, the most preferred social media platforms of music teacher candidates are instagram, twitter and youtube, and more than half of the music teacher candidates prefer mobile phones as a social media tool. Although it has been determined that they also use computers and tablets as social media usage tools, they are not preferred as much as mobile phones, mobile phones are widely chosen as a means of using social media, and music teacher candidates use social media mainly to listen to music, communicate and spend their spare time. used results were obtained. Deniz and Coşkun, (2004), Durmuş and Başarmak, (2014), Sırakaya and Seferoğlu, (2013) Tektaş (2014), Solmaz et al. (2013), Özalp and Akpınar (2018), Erol et al. (2021) with research have obtained similar results.

It has been determined that there is a significant difference between the gender of music teacher candidates and the sub-dimension of using social media for fun and relaxation, sub-dimension of using social media to get to know people better, and sub-dimensions of using social media for access to information. According to this; Male music teacher candidates use social media more for fun and relaxation than female music teacher candidates, male music teacher candidates use social media more often than female music teacher candidates to get to know people better, female music teacher candidates use social media compared to male music teacher candidates. It has been concluded that they use more information-oriented access. While the result that teacher candidates' social media usage status differs according to gender variables is also seen in Koçer, (2012) and Yayla's (2018) studies, it was concluded in Yeşiltaş's (2016) research that teacher candidates' social media usage did not differ according to gender variable.

In the light of the findings about whether the social media usage status of the music teacher candidates differ according to the individual instrument types they are studying, it was concluded that the social media usage status of the 212 music teacher candidates who were applied the scale differs according to the individual instrument types they are studying. In their research, Lei et al. (2021) found that music students from different instrument groups have some drawbacks in using social media, that they may experience problems in instrument development and intonation, and that music students from eight different instruments may encounter different problems in their use of social media.

In parallel with the results obtained from the research, music teacher candidates can provide conscious, useful, necessary self-control in their use of social media, and can provide the necessary controls themselves in line with the awareness of the power of use of the internet and social media. In today's information and technology age, in line with the use of the internet and social media, the necessary infrastructure, equipment and materials can be prepared in educational institutions in line with the use of technological tools by educators with their educational aspects and using them in educational activities, in-service trainings on the use of technology in education can be benefited, and educators can be informed in the context of technological innovations. Considering in parallel with the distance education activities that emerged after the pandemic, social media can be used more frequently in online education, and all kinds of communication tools brought by technology can be used in an educational context. Considering the positive impact, development and contribution of art, music and education on the individual, people can be directed to musical, artistic and educational activities from social media and internet and social media platforms, which are assumed to lead individuals from being introverted and socializing to individualization.

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Reasons and Opinions of Students Learning English as a Foreign Language about Learning the Target Culture

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Abstract

This study aims to compare the opinions of optional and compulsory preparatory class students about learning English and the target culture. Furthermore, students' reasons to learn English are examined in terms of independent variables (gender, going abroad and status of prep class). In the present study, data are gathered through a questionnaire in the fall term of 2021-2022 academic year. Data are obtained from 150 participants and analyzed via SPSS 25. Descriptive statistics and inferential statistics are conducted. Findings show that students are motivated to learn English both instrumentally and in an integrative way. In addition, there is no statistically significant effect of independent variables on the reasons to study English and the attitudes towards learning English and the target culture. As a result, this current study offers guidance for teachers while they are preparing their teaching materials. That is, teachers should consider not only the culture of British or American but also they should focus on other cultures.

Keywords: Foreign Language, Target Culture, Opinions of Learners, Reasons to Learn English

1. Introduction

Culture has attracted attention of many scholars and anthropologists through history. Their studies mainly were concerned with identification and explanation of culture. Also, incorporating culture into language teaching context has become the concern of language teachers for many years (Genc & Bada, 2005). It has become a vital topic in education when topics content and culture in language learning and teaching process have been considered (Byram & Grundy, 2003). The content of language refers to "speech acts, functions of language and the analysis of needs, for example, have led to a greater awareness of learners as social actors in specific relationships with the language they are learning, relationships which are determined by the sociopolitical and geopolitical circumstances in which they live" (Byram & Grundy, 2003, p.1). On the other hand, culture is categorized as a difficult notion to define with its many facets. For example, Brown (2007, p. 188) defines culture as "a way of life". "It is the context within which we exist, think, feel, and relate to others". A comprehensive definition about culture learning is suggested by Paige, Jorstad, Siaya, Klein and Colby (2000, p. 4) as in the following: "Culture learning is the process of acquiring the culture-specific and culture-general knowledge, skills, and attitudes required for effective communication and interaction with individuals from other cultures. It is a dynamic, developmental, and ongoing process which engages the learner cognitively, behaviorally, and affectively".

Genc and Bada (2005) discuss the importance of different cultures as “ethnocentricity limits the self, hence individuals have to look at themselves from a different perspective to surmount such limitation; thus, culture classes are vital in enabling individuals to see themselves from a different point of view” (p. 75). Therefore, everyone needs to learn and understand people and their traditions, beliefs and opinions.

Paige et al. (2000) also support the importance of learning a different culture and state that learners, who have information about cultures and some experience related to different cultures and have been motivated to learn cultures of different nations thanks to this knowledge and experience, begin to behave in the way which is compatible with this knowledge and feeling. They take initiative to learn firstly themselves as a cultural being, then the effect of culture on communication, behavior and identity, cross-cultural issues, particular culture and lastly the strategies to become an effective culture learner. When learners commence to learn culture, they become more interested in learning it because Tucker and Lambert (1972) state that learning culture attracts learners’ attention more than studying on linguistic aspects. According to them, the fact that learners are fed up with studying foreign languages results from linguistic repetitions and drills. On the contrary, learners have a desire to know the target nation, their way of life and to communicate with them, which motivates them to learn the language.

Similarly, Kim (2020) argues that language learning includes not only learning linguistic items and vocabulary but also learning the culture of other societies in which language is used in order to have experience in a different culture and to become a whole person. Thus, language learning is a tool for the development of humans (Kim, 2020). Besides Kim, Thanasoulas (2001) notes that communication takes place between the speakers effectively based on not only communicative competence but cultural competence, which helps speakers to respect and empathize with others and learning a foreign language includes learning the culture of this language. This will impede the misunderstanding and miscommunication in the conversation. Furthermore, learning culture “will affect their enthusiasm, attitude and motivation for language learning” (Göçen & Özdemirel, 2020, p. 80).

Consequently, culture incorporates members of a group (Brown, 2007), it helps the learners to survive in the new context in order to be a “globalized citizen” (Kuru-Gonen & Sağlam, 2012, p.26). Due to the other important concepts such as World Englishes as an international language (Matsuda, 2003), pluralism (Yumatle, 2015), global mobility in ELT (Codo, 2018) and multi-culturalism (Song, 2020), culture teaching is a must to see differences and similarities between different cultures (Genc & Bada, 2005), to become a whole person (Kim, 2020), to behave accordingly in a foreign culture (Thanasoulas, 2001), and to increase language learning motivation (Göçen & Özdemirel, 2020)

1.1 Previous Studies on Culture Teaching in Language Learning Process

In the literature, there are various studies on culture teaching in foreign language learning in Turkey (Belli, 2018; Genc & Bada, 2005; Göçen & Özdemirel, 2020; Karakuş, 2021; Kuru-Gonen & Sağlam, 2012; Tomak, 2012) and in second language learning abroad (Byrd, 2016; Sasani, 2018). All these studies will be summarized below.

While focusing on studies conducted abroad, Byrd (2016) carried out a survey research with 315 sixth- to twelfth-graders in the USA with an aim of investigating the perceptions of students about culturally relevant teaching with regard to their academic success and racial attitudes. These two independent variables affected students’ perceptions in a positive way. Additionally, Sasani (2018) revealed the opinions of non-native English teachers in the UK about intercultural competence through interviews and classroom observations. They had positive attitudes but they did not how to integrate it into the class systematically and they had some uncertainties such as time limit and students’ language level.

Two of the studies above are based on culture teaching in a second language teaching context, but our concern in this study is teaching culture in the foreign language context. Thus, studies carried out in Turkish context will be discussed and the underlying reason behind this current study will be presented.

Genc and Bada (2005) conducted a study with 38 students from ELT department at a university. After they had a culture course, they answered a questionnaire. Findings demonstrated “a culture class is significantly beneficial in terms of language skills, raising cultural awareness, changing attitudes towards native and target societies, and

contribution to the teaching profession” (p.81). Similarly, Belli (2018) investigated the attitudes of ELT students towards culture learning and teaching in the foreign language classes. According to the findings, majority of them had positive attitudes in terms of culture teaching and they believed that culture teaching would help students to be aware of different culture and they would become more tolerable to the differences.

Tomak (2012) examined perceptions of English language teachers about target culture teaching and data were gathered through the questionnaire and interviews. Results showed that teachers could not integrate target culture into their classes due to the time restriction in the intense curriculum and the researcher suggests that teachers should be trained how to integrate target culture in in-service teacher training. In the same vein, Kuru-Gonen and Sağlam (2012) aimed to find out teachers’ ideas about what they think and do in terms of culture teaching amid foreign language teaching. Findings showed that teachers knew the importance of culture teaching in foreign language classes. However, due to the curricular limitations, they could not integrate culture teaching into their classes.

Apart from opinions of ELT students and teachers about culture teaching and learning, Karakuş (2021) examined 22 foreign language course books in terms of world, target, and local cultures and cross-cultural comparisons. She found out that foreign language course books include mainly target culture, which refers to the lack of different cultural elements from world and local cultures.

Another different study in Turkish context is the study of Göçen and Özdemirel (2020), in which metaphorical perceptions of 180 students about Turkish culture who were studying Turkish as a foreign language in Turkey were revealed through the images and drawings. Content analysis method was employed in the study. Students identified Turkish culture with 106 metaphors under seven categories and they had positive attitudes toward learning Turkish culture. It might be concluded that “learners’ drawings that learning a language in the country/countries where it is spoken as the native language helps learning the culture. It can be inferred that there is a call for doing in-class instructional activities related to daily life and involving some extracurricular activities in teaching processes” (p.101).

To sum up, considering the target culture teaching and learning studies in the literature, it is concluded that there is a lack of research which concentrates on the comparison of opinions of students who learn English as a foreign language in a compulsory prep class and an optional prep class. The aim of the current study is to examine the attitudes towards learning culture of optional preparatory class students and compulsory preparatory class students. Furthermore, whether their reasons to learn English, gender, going abroad and status of prep class affect their attitudes towards learning a different culture will be revealed. The following research questions will frame this study.

RQ1: What are the reasons of students to learn English?

RQ2: Do the students’ gender, going abroad and status of prep class affect their reasons to study English?

RQ3: What attitudes do the students have towards learning English language and culture?

RQ4: Do the students’ gender, going abroad and status of prep class affect their attitudes towards learning English language and culture?

RQ5: Do students’ reasons to study English affect their attitudes towards learning English language and culture?

2. Method

2.1 Research Design

This study is based on a survey design in which a questionnaire is used to gather data from participants about their perceptions, behaviors and attitudes (Creswell, 2012). In this study, students’ reasons to learn English and their attitudes towards language and culture learning were revealed considering their gender, going abroad and status of prep class.

2.2 Setting and Participants

The study was conducted in the School of Foreign Languages of a state university in Turkey. 150 students participated in this study. 107 out of these students are studying English in an optional preparatory class (their majors vary from engineering to health) while 43 students are studying English in a compulsory preparatory class (their major is English Language and Teaching) (See Table 2). The number of male participants (n=89) surpasses the number of female students (n=61) (See Table 1). As it is seen in Table 3, only 20 students have been abroad while 130 students haven't been abroad yet.

Table 1: Descriptive Statistics by Gender

		f	%
Valid	Female	61	40.7
	Male	89	59.3
	Total	150	100

Table 2: Descriptive Statistics by the Status of Prep Class

		f	%
Valid	Optional prep class	107	71.3
	Compulsory prep class	43	28.7
	Total	150	100

Table 3: Descriptive Statistics by Going Abroad

		f	%
Valid	Not going abroad	130	86.7
	Going abroad	20	13.3
	Total	150	100

2.3 Instrument

In order to gather data in the study, a questionnaire was administered, which was adapted from various studies and used by Güven (2015) in her master's thesis. After piloting and making with necessary changes, she calculated reliability of the questionnaire and it was found as .788 (p. 46). Under demographic information category, a question about "the status of prep class in which students study" was added to the questionnaire in order to compare the ideas of both groups (compulsory and optional prep classes).

The questionnaire consists of 6 parts. First part (reasons to learn English), third part (attitudes towards learning culture), fourth part (teaching topics about the culture) are in the form of 5 point Likert scale. In the second part, students are asked to choose culture/s when they think of English culture. In the fifth part, they are asked to select the materials and activities to learn target culture. Finally, in the sixth part, demographic information such as gender, going abroad and their status of prep class is asked.

2.4 Data Collection and Analysis Procedure

After necessary permission was taken from the school, the questionnaire with the aim of the study was administered to students through Google forms in the fall term of 2021-2022 academic year. Data obtained from questionnaires were fed into a computer through SPSS 25. Afterwards, the data were analyzed using Descriptive and Inferential Statistics (Independent Samples t-Test and regression statistics)

3. Results

This study aimed to examine the attitudes towards learning culture of optional preparatory class students and compulsory preparatory class students. Furthermore, whether their reasons to learn English, gender, going abroad and status of prep class affect their attitudes towards learning a different culture were identified. Findings for each research question will be discussed below.

3.1 What are the Reasons of Students to Learn English?

Table 4: Reasons to Study English

Items	M	SD
To study in other countries	4.35	.919
To pass my classes in my department	4.11	1.075
To communicate with people from other countries	4.69	.592
To find work after graduation	4.72	.648
To get informed about the culture of other countries	4.22	.884
To use the Internet	4.16	.935
To watch movies or TV programs in English	4.48	.825
To take part in the cultural activities arranged by the European Union such as Erasmus and European Voluntary Service	4.58	.797
To listen to music in English	4.17	1.019
To visit other countries	4.81	.473
To follow published materials (books, journals and magazines) in English	4.21	1.012

As it is seen in Table 4 above, questionnaire item “to visit other countries” has the highest mean value ($M=4.81$, $SD=.473$), which is stated as integrative motivation and the lowest mean value refers to the item “to pass my classes in my department” ($M=4.11$, $SD=1.075$), which is categorized as instrumental motivation. The mean value for other items varies between these scores. It could be concluded that students are motivated to learn English both instrumentally and in an integrative way.

3.2 Do the Students' Gender, Going Abroad and Status of Prep Class Affect Their Reasons to Study English?

Table 5: Effect of Gender, Going Abroad and Status of Prep Class on the Reasons to Study English

Reasons to study English	<u>Female</u>		<u>Male</u>		t	p	df
	M	SD	M	SD			
	4.47	.342	4.35	.543			
	<u>Going abroad</u>		<u>Not going abroad</u>		t	p	df
	M	SD	M	SD			
	4.37	.42	4.41	.48			
	<u>Compulsory prep class</u>		<u>Optional prep class</u>		t	p	df
	M	SD	M	SD			
	4.50	.394	4.36	.499			

* $p<.05$

An independent samples t-test was carried out in order to find out to what extent gender, going abroad and status of prep class have an effect on the reasons to study English. Findings show that there is not statistically significance difference between females and males ($t(143.939)=1.636$, $p=.104$), between student going abroad and students not going abroad ($t(145)=-.342$, $p=.733$), and between students in compulsory prep class and optional prep class ($t(145)=-1.676$, $p=.096$).

3.3 What Attitudes do the Students Have towards Learning English Language and Culture?

Table 6: The Cultures of English Language

Items about the cultures of English language	n	%
Culture of British	118	78.6
Culture of American	116	77.3
Culture of countries in which English is the native language	62	41.3
Culture of countries in which English is the official language	15	10
Culture of countries in which English is spoken as a foreign language	30	20

No particular country's culture

4

2.6

According to Table 6, particularly two different cultures are thought by the students. 78.6% of students choose British culture and 77.3% of them select of American culture when they think of English culture. Also, some of the students (41.3%) think of the cultures of Canada, Australia and New Zealand where English is the native language.

Table 7: Attitudes towards Learning English Language and Culture

Items	M	SD
English language has become a world language rather than that of a particular nation	4.72	.463
It is necessary to have a good command of English that enables communication with foreigners	4.69	.615
English is the most widely used language in international communication.	4.78	.490
English language reflects one country's cultural values	2.17	1.012
To be able to speak good English, it is necessary to know about the culture of countries where English is the native language (America, England, etc.)	3.43	1.167
To have verbal and written communication skills in English has gained importance in each business sector.	4.71	.538
Cultural elements of different world countries should be introduced in English language classes	4.13	.836
Learning about the standards of judgment of other cultures improves our communication skills with people from these cultures	4.31	.687
I would like to learn about the similarities and differences between the cultures of other countries and Turkish culture	4.15	.857
Learning about other cultures is harmful to my own culture	1.76	1.107
In intercultural communication, it is important to know what not to say to whom in different cultures	4.40	.657
Learning about different cultural elements in English language classes makes language learning more interesting	4.20	.824
I do not think it is necessary to learn about the cultures of other countries	2.07	1.161
It's necessary to learn about how people from different countries behave in various circumstances to have better communication with them	4.38	.611
Introducing culture in English language classes teaches to be respectful of other cultures	4.25	.697
Gaining awareness about cultural differences can minimize misunderstandings among people from different cultures.	4.34	.611
During the introduction of different cultural elements in English language classes, I develop a negative reaction	1.72	1.087
Cultural content should be included in English language teaching curriculum	3.95	.873

According to Table 7 above, which shows the items about attitudes towards learning English language and culture, item "English is the most widely used language in international communication" has the highest mean value ($M=4.78$, $SD=.490$). The lowest item is "During the introduction of different cultural elements in English language classes, I develop a negative reaction" ($M=1.72$, $SD=1.087$). Both of these items as the highest and lowest ones imply that students know the importance of English and the target culture. Thus, they have a positive attitude to learn the language itself and cultural elements of this language.

Table 8: Topics about the Cultures

Items	M	SD
Turkey- life and culture	3.77	1.119
The U.K- life and culture	4.38	.704
The U.S.A. - life and culture	4.32	.721
The countries in which English is the native language - life and culture	4.02	.958
The countries in which English is an official language- life and culture	3.46	1.059

The countries in which English is a foreign language- life and culture	3.66	1.000
Issues related to science and technology	4.31	.727
Daily lifestyle, customs and traditions of different countries	4.32	.729
Issues related to politics	3.27	1.187
Issues related to world history	4.12	.989
Information on different religious practices	3.82	1.105
Communicative aspects like body language and idioms	4.15	.883
Architecture of other countries	4.22	.821
World literature and art	4.05	1.068
Food and clothes of other countries	4.32	.745
Leisure activities and styles of entertainment	4.30	.784
Social and historical aspects of different cultures (national holidays, national heroes, etc.)	4.12	.872

As it is showed in Table 8, item “Life and culture in the U.K” about the topics that students want to learn has the highest mean value ($M=4.38$, $SD=.704$). On the other hand, the lowest mean value refers to the item “Issues related to politics” ($M=3.27$, $SD=1.187$), which yields that students want to learn all the cultural topics mentioned in Table 8 above.

Table 9: Materials and Activities to Learn Culture

Items about the materials and activities to teach culture	n	%
Course book content	93	62
Classroom discussions of cultural experiences	95	63.3
Novels and short stories	69	46
Daily used items such as menus and tickets	68	45.3
Visual elements such as pictures and posters	88	58.6
Video films and documentaries	122	81.3
Newspapers and magazines	55	36.6

According to Table 9, majority of students (%81.3) want to learn culture through video films and documentaries whereas only 36.6% of them would like to learn via newspapers and magazines. That is, students prefer to learn target culture with visual and auditory materials.

3.4 Do the Students' Gender, Going Abroad and Status of Prep Class Affect Their Attitudes towards Learning English Language and Culture?

Table 10: Effect of Gender, Going Abroad and Status of Prep Class on the Attitudes towards Learning English Language and Culture

	<u>Female</u>		<u>Male</u>		t	p	df
	M	SD	M	SD			
	3.79	.323	3.79	.409	-.037	.970	140
Attitudes towards learning culture	<u>Going abroad</u>		<u>Not going abroad</u>		t	p	df
	M	SD	M	SD			
	3.84	.463	3.78	.361	-.568	.571	140
	<u>Compulsory prep class</u>		<u>Optional prep class</u>		t	p	df
	M	SD	M	SD			
	3.79	.349	3.79	.387	.075	.940	140

* $p<.05$

An independent samples t-test was run in order to examine whether gender, going abroad and status of prep class affect the attitudes towards learning English language and culture. Findings indicate that there is not statistically significance difference between females and males ($t(140)=-.037$, $p=.970$), between student going abroad and

students not going abroad ($t(140)=-.568, p=.571$), and between students in compulsory prep class and optional prep class ($t(140)=.075, p=.940$).

Table 11: Effect of Gender, Going Abroad and Status of Prep Class on the Topics about the Cultures

Topics about the cultures	<u>Female</u>		<u>Male</u>		t	p	df
	M	SD	M	SD			
	4.10	.448	3.99	.561	1.219	.225	145
	<u>Going abroad</u>		<u>Not going abroad</u>		t	p	df
	M	SD	M	SD			
	3.99	.585	4.04	.511	.387	.699	145
	<u>Compulsory prep class</u>		<u>Optional prep class</u>		t	p	df
	M	SD	M	SD			
	4	.519	4.05	.522	.498	.619	145

* $p<.05$

An independent samples t-test was run in order to identify to what extent gender, going abroad and status of prep class have an impact on the topics about the cultures. As it is seen in Table 9, there is not statistically significance difference between females and males ($t(145)=1.219, p=.225$), between student going abroad and students not going abroad ($t(145)=.387, p=.699$), and between students in compulsory prep class and optional prep class ($t(145)=.498, p=.619$).

3.5 Do Students' Reasons to Study English Affect Their Attitudes towards Learning English Language and Culture?

Table 12: Effect of Reasons to Learn English on the Students' Attitudes towards Learning English Language and Culture

Independent Variables	R	R Square	Adjusted R Square	Standard Error	F Model	p
Reasons to learn English	.423	.179	.173	.331	29.807*	.000

* $p<.05$

A regression analysis was run to identify the effect of reasons to learn English on the students' attitudes towards learning English and culture. Findings show that reasons of students to learn English significantly explain the variation in their attitudes towards learning culture ($F(1,137)=29.807, p=.00$).

4. Conclusion and Discussion

This present study focused on identifying the attitudes towards learning culture of optional preparatory class students and compulsory preparatory class students and their reasons to learn English. Also, the effect of independent variables "gender, going abroad and status of prep class" was examined. Specifically, this study was based on a survey design. In other words, it was a quantitative study. Findings of the study demonstrated the attitudes of students towards culture learning and their reasons to learn English and the effect of the independent variables on these variables.

The most important finding is that students are motivated to learn English both instrumentally and in an integrative way as all the items about their reasons to learn English have high mean values. There is no statistically significant effect of gender, going abroad and status of prep class on the reasons to study English. It is a bit hard to investigate attitudes independent from motivation as they have a close relationship between each other. Therefore, attitudes were investigated in interaction with motivation. Students' reasons to learn English significantly explain the variation in their attitudes towards learning culture. Related to this topic, Gardner and Lambert (1972, cited in Genç & Bada, 2005, p.74) similarly indicate that culture learning has an important role on motivation as learners

become more curious about and interested in target country. They are keen on the culturally based activities such as role-playing, dancing, searching about countries and people. Therefore, learners might give up their ‘stereotyping’, ‘political bias’, and ‘triviality’ towards particular culture (Patrikis, 1988, p.18, cited in Hadley, 1993, p.367).

Especially today common political and psychological movement around the world such as globalized citizen (Kuru-Gonen & Sağlam, 2012), World Englishes as an international language (Matsuda, 2003), pluralism (Yumatle, 2015), global mobility in ELT (Codo, 2018) and multi-culturalism (Song, 2020) make foreign language and its culture crucial. Therefore, learning culture in language learning process places an important role in internalizing the language. That is to say, one can learn how to behave, what to say, how to use language appropriately in different foreign social contexts. This has made integration of culture into English teaching and learning an inevitable part in ELT area over the past four decades. However, thoughts and feelings of language learners towards learning culture are of great importance. According to the findings of the current study, students are aware of the importance of English and the target culture. They have a positive attitude to learn the language itself and cultural elements of this language. However, when they think the target culture, most of them state British culture and American culture. They want to learn about various cultural elements such as life and culture, daily lifestyle, customs and traditions, literature and art, food and clothes, leisure activities and styles of entertainment in the UK and the USA or other countries in which English is a foreign language or an official language. As teachers need to prepare students for their future, by means of the concept “World Englishes” teachers can present “a different way of looking at the language, which is more inclusive, pluralistic, and accepting than the traditional, monolithic view of English in which there is one correct, standard way of using English that all speakers must strive for. In a sense, incorporating World Englishes is like putting on a new pair of glasses” (Matsuda, 2003, p.727)

Another finding of the study shows that there is no statistically significant impact of gender, going abroad and status of prep class on the attitudes towards learning English and culture, and the topics about the cultures. As the participants have positive attitudes towards learning culture, teachers can integrate culture teaching into the course. The teacher can provide students with different cultural materials and events to draw their attention to the language learning. Findings of the study also provide guidance for teachers while they are preparing their materials as students prefer to learn target culture with visual and auditory materials. Consequently, students’ success can also increase as in the study of Rehman and Umar (2019) in which students of the treatment group were taught through intercultural curriculum and they improved their reading comprehension effectively in the target language. Matsuda (2003) suggests “If face-to-face interactions are not possible, teachers can introduce different varieties of English through e-mail exchanges, projects that require students to visit Web sites in various Englishes, or by showing movies and video clips of World Englishes speakers” (p.723). Additionally, Dema and Moeller (2012) conclude that digital tools help teachers to integrate cultural elements into language classroom as they provide a dynamic process with real-life materials. Learning culture makes learners to be motivated and engaged in the process to have cultural awareness and to overcome bias. Kim (2020) suggests that teachers should help learners to take part in the culture and empathize with others while teaching a language and she adds that it is a must in the global World where everything is dynamic.

As for the methodological implications, to make investigation more deeply and findings more precise, a follow-up study might be conducted with interview questions or an experimental study might be designed. Furthermore, another section might be added to the study to measure the success of the students to broaden the research after the experimental study. Finally, the questionnaire might have been applied to more students in various universities, so the validity of the research would increase.

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The Evaluation of Faculty of Education Students' Self-Efficiency Beliefs for Museum Education

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Abstract

Museum education is a field that requires teachers to work with faith in school-museum cooperation. The aim of this study is to examine the self-efficacy beliefs of the students of the Faculty of Education of a university regarding museum education. 692 students studying at the Faculty of Education of a university participated in this study, which was carried out with the scanning model. The data of the research were obtained with the Student Identification Form (SIF) and the Self-Efficacy Belief Scale for Museum Education (SEBSFME). The average age of the students is 21.15 (SD: 1.801), 76% of them are women, most of them (69.7%) live in the city. 29% are in the 1st grade, 25.7% are in the 4th grade. 26.4% of the students are in Turkish Language Teaching, 21.2% in Social Studies Teaching and 15.9% in Art-Music Teaching. The mean score of SEBSFME is 80.86 (SD: 18.06). There was no significant difference between the SEBSFME mean score and variables such as age, gender, and place of residence. The difference between the students' grade level, department, visiting the museum and taking courses related to the museum was statistically significant. ($p < 0.05$). Self-efficacy belief towards museum education was found above the average scores of the Faculty of Education students. It is important for the students of the faculty of education, who are the teachers of the future, to develop their self-efficacy beliefs by being supported by museum education, which provides the development of important educational features such as questioning, research and examination.

Keywords: Museum, Education, Museum Education, Self-Efficacy, Belief, Visiting the Museum

1. Introduction

1.1 Introduce the Problem

The museum has services such as preserving, creating documents, publishing scientific publications and presenting these publications to the public. Since the 20th century, the main purpose of museums has been expanded as the transfer of culture and science to all segments of society. For this reason, the educational function of museums, besides collecting, protecting, examining, evaluating and exhibiting, has been shaped as a guide (Atagök 1982: 2; Maccario, 2002: 276).

Museology has led to a revolutionary development by being divided into sub-fields such as museum management, restoration - conservation, exhibition design, education, visitor relations, research, archiving and communication (Mensch, 2004:5). Participation in museums at the individual level can be a source of self-actualization, confidence and creativity, while at the societal level, such as social renewal, health, welfare, social assistance. It increases inter-individual and social cooperation in areas (Sandell, 2003:45).

The International Council of Museums (ICOM) emphasizes that the museum is an education, research and cultural center within its ethical codes. According to the ethical codes, museums are institutions that preserve, examine and promote the cultural and natural heritage by preserving their primary functions, but they must put their collections at the service of society and social development. Museum means knowledge, but at the same time it is the space to place, validate, develop and maintain knowledge (Griffin; 2004; Lord, 2007:13-19).

Visual culture is the gateway to the field of culture by communicating with various cultural elements through images. Museum education offers its visitors a visual learning environment that activates their own interpretation strategies and vocabulary (Greenhill, 2000). Therefore, using visual culture elements for the purpose of explaining the museum collection is among the priorities of the contemporary museum. In the educational arrangements in the museum, it should be emphasized by using visual culture elements that what the audience will see, how to determine the direction, what to focus on and why it is important to be remarkable. In this context, museum exhibitions also aim to share technological experiences and opinions, and there are educational auxiliary materials such as computer screens, hologram (digital counter), virtual travel, effectvision, three-dimensional scanning, simulator, three-dimensional modeling and digital applications (Karadeniz, et al. 2015; Kaschak, 2014).

Human success; behavior depends on the interaction between personal factors (such as attitudes, thoughts, beliefs) and environmental conditions (Schunk & Pjares, 2002). Therefore, people's beliefs about their own abilities are the determinants of their performance in a given situation. Accordingly, self-efficacy is not related to how competent an individual is in his skills, but to his belief in his own abilities. Self-efficacy beliefs determine how individuals feel, think, motivate themselves and behave (Akkoyunlu, Orhan & Umay, 2005: 1; Yeşilbursa & Uslu, 2014).

Bandura (1989) argues that self-efficacy belief determines the level of motivation of a person for a particular task. A person with high self-efficacy shows more persistence when faced with difficulties related to a particular task than a person with lower self-efficacy for that task. Strong belief in one's abilities increases persistence and effort. A person with high self-efficacy shows more persistence when faced with difficulties related to a particular task than a person with lower self-efficacy for that task. Strong belief in one's abilities increases persistence and effort. Since self-efficacy belief is an important concept that explains whether there is a difference between what individuals believe they can do and what they do (Kurt, 2012), contributing approaches can be developed to improve the ability of individuals by evaluating their self-efficacy perceptions in education faculty students, who are prospective teacher candidates. Thus, the perception of competence about the museums of the art educator who examines the works in the museum is important. The assessment of the self-efficacy belief of the arts educator allows them to evaluate their own learning and teaching processes. Evaluation of self-efficacy belief also allows the art educator to have an idea to make predictions about the level of cognitive self-sufficiency in educational environments and to make special judgments. With these judgments, art educators may experience success or limitations in their success by being positively or negatively affected in their studies in a special field (Bandura, 2012).

In the early 1990s, museum education was accepted as an interdisciplinary field that required a separate specialization and training, and in many countries, museology courses were opened in the field of visual arts education in universities and programs that provide museology and museum education formation was included (Kee - Kai, 2011:51). Museum education is a field that requires school-museum cooperation, and requires teachers to work with faith and make good planning. In order for students to benefit from museums at the highest level, an effective museum visit should be planned and the museum visit should be integrated with the curriculum. Teachers should also have sufficient knowledge and experience to integrate the museum visit and the curriculum; It is important that they create a good learning environment in order to turn it into a meaningful and effective learning experience. The fact that museum education requires good planning, associating with the program, integration and

cooperation reveals the necessity of revealing the self-efficacy beliefs of the education faculty students, who are the teachers of the future, about museum education. In this context, it is important to determine the self-efficacy beliefs of teacher candidates studying at education faculties towards museum education.

In this study, which aims to reveal the self-efficacy beliefs of the students of the Faculty of Education towards museum education, the following research questions were answered on the basis of this main framework.

1. What are the self-efficacy beliefs of education faculty students towards museum education?
2. Is there a significant gender difference in the self-efficacy beliefs of education faculty students towards museum education?
3. Is there a significant difference in the self-efficacy beliefs of education faculty students towards museum education according to grade level?
4. Is there a significant difference in the self-efficacy beliefs of education faculty students regarding museum education according to their departments?
5. Is there a significant difference in the self-efficacy beliefs of the education faculty students towards museum education, according to the status of taking courses related to the museum?
6. Is there a significant difference in the self-efficacy beliefs of education faculty students regarding museum education compared to their previous visit to a museum?

2. Method

This study was conducted with the survey research model, which is a quantitative research method. In descriptive studies that try to define any situation of interest, revealing a situation objectively is done with the scanning model (Karasar, 2009).

2.1 Participant (Subject) Characteristics

This study was carried out with 692 teacher candidates who continue their education in the Faculty of Education of a university and volunteer to participate in the study in the 2022-2023 academic year. The personal and educational characteristics of the students are shown in Table 1.

Table 1: Descriptive Characteristics of Education Faculty Students (n:692)

Characteristics	n	%
Age;Min-Max.;Mean Age (Standard Deviation) Min-Max: 18-26 21.15 (SD:1.801).		
Gender		
Female	526	76.0
Male	166	24.0
Department		
Painting-Business Education	62	9.0
Music Teaching	41	5.9
Turkish Teacher	183	26.4
Social studies teacher	147	21.2
Pre-school teaching	60	8.7
Psychological Counseling and Guidance	35	5.1
English teacher	90	13.0
Science teacher	19	2.7
Elementary Mathematics Teaching	33	4.8
Classroom teaching	22	3.2
Class		
1. Class	201	29.0
2. Class	145	21.0
3. Class	168	24.3
4. Class	178	25.7
Residential area		
village-town	41	5.9

District	169	24.4
City	366	52.9
Big city	116	16.8

Table 1 shows the personal and educational characteristics of the students. The average age of students who are minimum 18 and maximum 26 years old is 21,157 (standard deviation: 1,801)years. 76% (526 students) of the students are female and 24% (166 students) are male. 26.4% of the students were Turkish Language Teaching, 21.2% Social Studies Teaching, 13% English Teaching, 9% Art Education Teaching, 8,7% Preschool Teaching, 5,9% Music Teaching, 5,1% 'i Psychological Counseling and Guidance, 4,8%', Elementary Mathematics Teaching, 3,2% of them are studying in Classroom Teaching and 2,7% of them are studying in Science Education (Table 2). 29% of the students are 1st grade, 21% are 2nd grade, 24,3%3. grade and 25,7% are 4th grade students. On the other hand, 52,9% of the students live in the city and 5,9% in the village-town.

2.2 Measures and Covariates

2.3.1. Data Collection Tools

Two forms were used to collect data with the Student Introduction Form and the Self-Efficacy Beliefs Scale for Museum Education.

Student Introduction Form: In this form, there are questions about the personal and educational status of the student, such as the main art or department, class, age and gender, faculty, department, and museum experiences. *Self-Efficacy Beliefs Scale for Museum Education:* "The Self-Efficacy Beliefs Scale for Museum Education" developed by Yeşilbursa and Uslu (2014) on social studies teacher candidates consists of 24 questions. The Self-Efficacy Beliefs Scale for Museum Education was prepared in a 5-point likert type. The items in the scale are graded as "I am Completely Incompetent", "I am Inadequate", "I am Partially Sufficient", "I am Sufficient" and "I am Completely Sufficient", provided that they are scored from 1 to 5. The lowest score to be taken from the scale is 24 and the highest score is 120. As the score increases, self-efficacy belief in museum education increases. The Cronbach Alpha coefficient for the internal consistency of the items was found to be .96 (Yeşilbursa & Uslu, 2014). In this study, the Cronbach Alpha coefficient of the scale was .92.

Ethical Dimension

Institutional and necessary permissions were obtained from the Social and Human Sciences Ethics Committee of Sivas Cumhuriyet University in order to carry out this research.

Data analysis

Data analysis was done in SPSS (Ver: 22.0) package program. Descriptive statistics were applied to the data obtained in the study. Self-efficacy beliefs for museum education were determined by looking at the mean values of the groups with descriptive statistics. Arithmetic mean (\bar{X}) and standard deviation (Ss) were used to evaluate students' self-efficacy beliefs. In this study, it was analyzed that the skewness values of the scale were between -1 and +1, and as a result of the analysis, the significance value of the Shapiro-Wilk test was greater than 0.05, and the data were normally distributed. Due to the normal distribution, t-Test and one-way analysis of variance (ANOVA) were applied for samples independent of parametric analysis techniques. In the statistical tests, 95% confidence interval and $p < 0.05$ were taken as significance level.

3. Results

This section contains the results obtained from the study. The personal and educational characteristics of the students and the results of the analyzes on the Self-Efficacy Belief Scale for Museum Education are given in this section.

Table 2: Average of Students' Self-Efficacy Beliefs for Museum Education (n:692)

Mean	Standard Deviation	Minimum	Maximum
80.869	18.066	24	120

When the students' self-efficacy belief scores regarding museum education are examined in Table 2, it is seen that the average score is 80,869, the standard deviation is 18,066, and the min-max is 24-120 points.

Table 3: Students' Self-Efficacy Beliefs for Museum Education by Gender

Gender	Mean	Standard Deviation	Statistical Tests
Female	3.37	0.711	t:0.613
Male	3.33	0.873	p:0.540

As seen in Table 3, there is no difference between the students' self-efficacy beliefs regarding museum education according to their gender ($p>0.05$).

Table 4: Self-Efficacy Beliefs for Museum Education According to Students' Departments

Departments		n	Mean	Std. Deviation	Sum of Squares	Sum of Squares	df	F	Sig.	Significant Difference
1.	Painting-Business Education	62	3.3871	.81400	Between Groups	17.894				2-4 3-6
2.	Music Teaching	41	3.3037	.64298						
3.	Turkish Teacher	183	3.5147	.77341			9			
4.	Social studies teacher	147	3.6715	.57949						
5.	Pre-school teaching	60	3.3274	.68032						
6.	Psychological Counseling and Guidance	35	3.1750	.87010				3.629	.000	
7.	English teacher	90	3.6360	.82471	Within Groups	373.665	682			
8.	Science teacher	19	3.0707	.73254						
9.	Elementary Mathematics Teaching	33	3.4034	.46813						
10.	Classroom teaching	22	3.2368	.91825						
					Total	391.560	691			

When the average scores of self-efficacy beliefs related to museum education are examined according to the education faculties of the students in Table 4, it is determined that there is a difference between the departments ($F: 3,629$, $p: 0.000$). The difference between which groups was determined by Bonferroni multiple comparison test. It was determined that the difference was between social studies teaching and English teaching, in favor of social studies teaching, and between Turkish teaching and preschool teaching in favor of pre-school teaching.

Table 5: Students' Classes and Self-Efficacy Beliefs Regarding Museum Education

Class	n	Mean	Standard Deviation	Sum of Squares	df	Mean Square	F	p	Significant Difference (Scheffe)
1.Class	40	76,2289	18,92055	167,777	80	2,097	1,681	,000	1-4
	169	79,5862	18,72372	762,459	611	1,248			

2.Class	Within Groups					
3.Class	366	81,9405	15,13916	Total	930,236	691
4.Class	116	86,1461	17,70221			

In Table 5, the total scores of students' self-efficacy beliefs towards museum education showed a significant difference according to the class variable [$F(1, 681), p < .001$]. Accordingly, a significant difference was determined between the self-efficacy beliefs of the students regarding museum education according to their classes.

Scheffe multiple comparison test was performed to see between which groups this difference was. According to the Scheffe multiple comparison test results, the mean scores of the students of the Faculty of Education in the first year of their self-efficacy beliefs towards museum education ($\bar{X} = 76,2289$) and the total score averages of the self-efficacy beliefs of the students in the fourth grade towards museum education ($\bar{X} = 86,1461$), a significant difference was found in favor of the Faculty of Education students studying in the fourth grade. Accordingly, fourth grade students have higher self-efficacy beliefs towards museum education.

Table 6: Students' Expressions Regarding Museum Experiences and Self-Efficacy Beliefs for Museum Education

Taking lessons about the museum	n	Mean	Standard Deviation	Statistical Tests
Yes	587	3,406	0.728	t:3.106
No	105	3,160	0.851	p:0.002
Making a museum visit				
Yes	591	3.420	0.719	t:4.383
No	101	3.070	0.867	p:0.000

In Table 6, students who took museum-related courses during their education were found to have higher self-efficacy beliefs about museum education than those who did not, and the difference was significant ($t:3.106, p:0.002$). On the other hand, the self-efficacy beliefs of museum visitors were found to be higher than those who did not, and the difference was statistically significant ($t:4.383, p:0.000$).

4. Discussion

In this study, which was conducted to examine the self-efficacy beliefs of museum education students of a university's Faculty of Education, the students' self-efficacy beliefs were found to be above the average. This average was found to be lower than the average score obtained in Woolfolk Hoy and Burke Spero (2005)'s study named changes in teacher efficacy during the early years of teaching: A comparison of four measures. In the study by Yeşilbursa and Uslu (2014), which evaluated the self-efficacy beliefs of social studies teacher candidates towards museum education, the average score was found to be higher than the average score obtained in this study. Friedman and Kass (2001) state that a teacher's perception of self-efficacy should extend beyond the classroom space. Museums are especially preferred in terms of enabling them to obtain information directly, to direct students towards research and examination, to actively participate in the learning environment, to realize permanent learning by doing and living, to motivate creative power and thought, and to enable the individual to express himself better by giving a feeling of a free environment.

In the literature, teachers with high self-efficacy beliefs are more persistent, more hardworking, more willing to teach, more understanding towards their students who make mistakes, have more goals and desires, have more teaching responsibilities, are more open to new ideas, have a higher level of planning and It is stated that they have organizational skills (Anderson, 2010; Tschannen-Moran & Woolfolk Hoy, 2001). For this reason, it is important to make the necessary improvements in the curriculum for the students of the Faculty of Education, who are prospective teachers of the future, to have high self-efficacy in museum education.

In the study, the relationship between some personal and educational characteristics of the students who continue their education at the Faculty of Education and their self-efficacy beliefs about museum education was also examined. Accordingly, no difference was found between the students' gender, place of residence, faculty and department they studied, and the average scores of the self-efficacy beliefs scale regarding museum education. However, in this study, determining a significant difference in the self-efficacy beliefs of the students of the Faculty of Education towards museum education according to the grade level is another important result. According to the Scheffe multiple comparison test results, it was determined that the difference was between the first and fourth grades. A significant difference was found in favor of the Faculty of Education students studying in the fourth grade. Accordingly, fourth grade students have higher self-efficacy beliefs towards museum education. In some similar studies, while the class variable did not affect the self-efficacy beliefs of pre-service teachers (Akkuş, 2013; Aylar & Aksin, 2011; Bümen & Özyayın, 2013), in another study, there was a significant difference in favor of 3rd grade students in a study on museum education between 3rd and 4th grades. a difference was obtained (Yeşilbursa and Uslu, 2013). There are similar studies in which pre-service teachers' self-efficacy beliefs increase as their grade level increases (Şahin-Taşkın & Hacıömeroğlu, 2010; Pendergast et al., 2011). In this study, the Self-Efficacy Belief Scale for Museum Education was applied to all classes and a difference in favor of the fourth grades was obtained. The reason for this may be the possibility of increasing self-efficacy along with the skills gained periodically during university education. It is thought that this may be related to the fact that the candidates, who gradually adapt to the profession and gradually take an active role in the process with teaching practice and museum lessons, may begin to perceive themselves more positively in terms of museum education self-efficacy. It can be stated that the difference in different studies on the class variable is due to the sample change in the studies.

Another important data obtained in this study is that there is a difference between self-efficacy beliefs towards museum education according to the departments that train teachers in the education faculty. According to the interdepartmental multiple comparison analysis, it was determined that there was a positive difference between social studies teaching and English teaching, in favor of social studies teaching, and between Turkish teaching and preschool teaching in favor of preschool teaching. In the study conducted by Yeşilbursa and Uslu (2014) on third and fourth grade students of social studies teaching department, students' self-efficacy beliefs towards museum education were found to be high. Since the study was conducted on only one section in this study, no comparison with other sections was made.

In Saracaloğlu, Yenice, and Özden's (2013) study, "Examination of teacher self-efficacy perceptions and academic locus of control of science, social studies and classroom teacher candidates," primary school students' perceptions of teacher self-efficacy were found to be high. Although there are many studies in the literature (Akkuş, 2013; Pendergast et al., 2011; Saracaloğlu, Yenice and Özden, 2013; Yılmaz and Egüz, 2015) on students studying in teacher-training departments, a limited number of studies (Yeşilbursa and Uslu, 2014) evaluating self-efficacy in museum education are available. For this reason, since this study is a study that evaluates self-efficacy in museum education by considering all departments and all classes of a teacher-training faculty, it is different from other studies and is thought to provide different inputs to the literature. While it is considered as one of the strengths of the study that teacher candidates studying in different branches make comparisons between self-efficacy beliefs about museum education and provide more detailed information in this way, it can be considered as a limitation of the study that the study is carried out only in the education faculty of a university. For this reason, necessary planning should be made considering the need for large-scale studies to be carried out in the future.

Another result obtained in this study is that students who took museum-related courses during their education had higher self-efficacy beliefs about museum education compared to those who did not, and those who visited the museum did not, and the difference was statistically significant. When the studies on the self-efficacy beliefs of teacher candidates for museum education were examined, it was found that the self-efficacy beliefs for museum education were found in favor of those who took the courses (Körükçü, 2019; Yeşilbursa and Uslu, 2014). It is an expected result that the museum education self-efficacy score averages of the teacher candidates who take museum education courses and visit museums are higher. On the other hand, the fact that the museum education self-efficacy belief is higher among the teacher candidates who visit the museum is similar to the literature knowledge (Dilmaç, 2016; Kıyıcı & Yiğit, 2013; Körükçü, 2019; Ustaoglu, 2012). In addition, Yılmaz and Egüz (2015) determined that museum visits increase the interest in the lesson in the learning process, develop the sense of

curiosity, and encountering the objects in the museum facilitates the reinforcement of the learned information, and also contributes to permanent learning. It is seen that the self-efficacy perception scores of the primary school teacher candidates are higher than the teacher candidates studying in other departments.

A person with high self-efficacy shows more persistence when faced with difficulties related to a particular task than a person with lower self-efficacy for that task. Strong belief in one's capabilities increases persistence and effort (Schunk, 1981; Zimmer and Ringle 1981; Bouchard, 1990, Kotaman, 2008). Therefore, in order to support the professional development of the students of the education faculty, who are the teachers of the future, it is important to give lessons and make practices related to the field of increasing self-efficacy. It should not be forgotten that a teacher with a high self-efficacy belief will raise students with this belief in the future.

In this case, as determined in this study, both taking the courses related to the museum and visiting the museum are the factors that positively affect the self-efficacy belief towards museum education, and these factors should be taken into account in educational institutions. Museum courses should be taught as a compulsory course in the relevant departments of the Education Faculties that train teachers. In addition, it is important that museums are used as an educational environment in all areas that train teachers, especially in the department of fine arts education.

5. Conclusion and Recommendations

In this study, which was conducted to examine the self-efficacy beliefs of museum education and some personal and educational factors affecting the students of the Faculty of Education of a university, the self-efficacy beliefs towards museum education score were above the average. There was no difference between students' personal characteristics such as age, gender, and place of residence and their self-efficacy beliefs about museum education. On the other hand, it was determined that the variables such as the class, department, taking museum lessons and visiting the museum affected the students' self-efficacy beliefs towards museum education.

In line with these results;

- Museums should be institutions that should be included in education and training, as out-of-school learning environments, as places that train students, make them think, and complement the knowledge learned at school with permanent learning by offering different perspectives, and they should ensure continuity in their teaching function,
- Museum education course should be compulsory in teacher training departments and this course should be given by museum educators who are experts and competent in their fields.
- Museum education practices that will contribute to the professional development process in teacher training faculties should be addressed with a multidisciplinary approach that will be supported by different activities to be designed or methods and techniques to be used regarding the achievements in the curriculum, by associating them with different disciplines.
- Museum education self-efficacy studies should be carried out with large-scale studies.

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An Investigation of Undergraduate L2 Writers' Motivational Writing Regulation Strategies in Relation to Collaborative Learning Beliefs

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Abstract

The concept of motivational regulation has always been on the agenda of researchers; however, the role of motivational regulation has received relatively little attention in terms of writing skills. Hence, the present study aims to investigate the potential correlations between motivational writing regulation strategies concerning collaborative writing beliefs of undergraduate L2 writers. To this end, a total of 102 undergraduate L2 writers were surveyed. To collect the data, two research tools were used. The first one is the *Writing Strategies for Self-regulated Learning Questionnaire (WSSRLQ)* (Teng and Zhang 2016a). This questionnaire conceptualizes motivational writing regulation strategies in terms of cognitive, metacognitive, and social-behavioral factors. The second data collection tool employed in the present study was the *Collaborative Learning Beliefs Survey*, which was prepared based on Roskams (1999). According to the findings of the study, there is a correlation between self-regulated writing strategies and collaborative learning beliefs. Hence, it is suggested that EFL writing instructions focus on motivational regulation strategies and other aspects of self-regulated strategies to ensure effective L2 writing instruction.

Keywords: Writing Self-Efficacy, Collaborative Learning Beliefs, Undergraduate L2 Writers

1. Introduction

Self-regulated learning requires motivational regulation (MR). Zimmerman and Schunk (2008) define it as the purposeful alteration of students' excitement or motivational processing to achieve academic achievement. There is an increasing realization that the interplay of MR tactics with other aspects of self-regulated learning strategies ought to have a significant impact on student commitment, achievement, as well as other learning outcomes (Wolters et al. 2011). A previous study found that learners who used MR approaches were more likely to start, maintain, and improve their motivation or effort to complete a task (Wolters & Benzon, 2013).

Considering the complexity and challenges of writing, motivational control becomes crucial in the writing-learning process (Hayes, 2012). It has previously been stated that effective writers are expected to utilize a range of

motivational regulation strategies to experience pleasant sentiments, interests, and self-initiated ideas that lead to the attainment of several literary goals, such as improving writing abilities and essay quality (Boscolo & Hidi, 2007). According to the experts, MR demonstrates how pupils can overcome barriers and maintain or boost their enthusiasm for learning (Wolters & Mueller, 2010). As a result, the usage of other learning methods that have been proven to be directly related to learners' educational performance in writing in other language situations is impacted (Teng & Zhang, 2016). Despite this, little research has been conducted on the role of motivational regulation strategies in the L2 writing process. There is a paucity of research-based information on how MR strategies affect students' academic achievement while interacting with other aspects of self-regulation. This is particularly evident in EFL writing.

Collaborative writing, on the other hand, is a type of peer work that is frequently employed in language-learning settings by some academics. Over the last thirty years, collaborative writing has grown in popularity as a useful instructional activity in language learning contexts as part of the change from teacher-centered to student-centered instructional strategies (Bygate et al., 2013). Simultaneously, technological advancements have made collaborative writing more easily adopted in a variety of educational contexts (Li & Storch, 2017). While collaborative writing is acknowledged to be good for language learners, studies of collaborative writing provide varying outcomes in terms of how students perceive collaborative writing, their behaviors during the co-writing activities, and if language learning occurs during such settings. Furthermore, instructors' reluctance to employ collaborative writing activities is documented, which may be attributable to a lack of understanding of the potential advantages of collaborative writing for language learners. There are also practical considerations about implementing collaborative writing in foreign language classrooms, including difficulties in assessment (Storch, 2013), participants' proclivity to using their mother tongue (Riley, 2009), and unaddressed linguistic issues, which makes collaborative writing research in language classes extremely difficult (Kim & McDonough, 2008).

Even though collaborative writing has garnered a lot of attention from scholars, there have been very few studies on this issue. Given the aforementioned research gaps, the purpose of this study is to look into possible links between motivational writing control mechanisms and collaborative writing attitudes of undergraduate L2 writers.

2. Literature Review

2.1. Motivational Writing Regulation Strategies

Writing is a social mental activity in which writers are aware of the demands of their readers and are eager to put in the specific time and effort required to improve written drafts till they communicate effectively (Zimmerman & Risemberg, 1997). According to the preceding explanation, excellent writing necessitates not only pupils' metacognitive and cognitive participation, but also their motivational control in employing several methods to boost their attempts and perseverance in finishing writing tasks (Manchón et al., 2007). According to some research studies, higher-skilled EFL authors used more effective and comprehensive metacognitive and cognitive strategies including organizing, reviewing, and editing than their less-skilled peers (Zhang et al., 2016). Nevertheless, students' awareness of metacognitive and cognitive strategies is frequently insufficient to foster active involvement in writing assignments (Andrade & Evans, 2013). Many academics contend that for writers, writing activities are sometimes fundamentally tough since they strain various higher and lower-order psycholinguistic processing which exist within a constant motivational state (Troia et al., 2013). This indicates that good authors must be inspired to begin, continue, or increase their willingness to begin, offer work toward, or accomplish a certain activity or objective (Wolters, 2003).

The need for the use of MR strategies is especially highlighted in Turkey, where learning writing in English is commonly regarded as the most difficult job for many English language learners. This indicates that Turkish language learners must not only employ a variety of metacognitive and cognitive strategies to assist them to fulfill learning objectives, but they must also utilize certain ways to manage their negative emotions to continue their learning efforts. Zimmerman (2011) and Oxford (2013) claim that these active string arrangements of learning processes help learners perform better. Considering the paucity of research into MR strategies in the foreign language writing context, it is necessary to investigate how Turkish learners actively manage their motivation during the writing-learning process. The study of how motivational regulation tactics impact writing performance

is quite interesting. This is because self-regulated learning is a multidimensional, integrated concept that emphasizes the triadic interplay of motivational regulation, metacognitive strategies, and social contextual elements in the process of learning (Zimmerman & Schunk, 2008).

2.2. Collaborative Writing Beliefs

Collaborative writing offers a social environment for L2 learners' language learning by allowing them to exchange ideas, gather language materials, give collective scaffolding, and internalize the information that they co-create with peers (Thorne & Hellermann, 2015). Yet, while examining collaborative writing, researchers discovered that just assigning learners to engage with peers does not guarantee that they will write cooperatively (Storch, 2013). A lot of research studies have been conducted to analyze group dynamics, and most of them have indicated that students learn more from collaborative-oriented interaction contexts (Walls, 2018).

Several research studies on learners' perceptions of collaborative writing tasks in language classes have indicated that learners usually believe collaborative writing activities are helpful, with a variety of advantages. These include increasing consciousness and writing skills; enabling good written and verbal communication through a method of concept mapping, realigning linguistic features, getting instant feedback; as well as providing more chances to interact with other classmates, presumably reducing writing anxiety (Fernandez Dobao, 2020). While students have generally positive opinions of collaborative writing, they have voiced certain reservations about participation in collaborative writing activities. In a study, some learners prefer writing alone to collaborative writing since they believe the varying working pace and various perspectives about the assignment would lead to disagreements among group members. Others are hesitant to address their peers' mistakes because they feel insecure about their language abilities and are afraid of criticizing others (Fernandez Dobao & Blum, 2013).

Although previous research has shown that students' ability to collaborative learning and group relationships should shape their attitudes toward collaborative writing (Chen & Yu, 2019), it has also been suggested that ethnic attitudes may have a substantial impact on students' views regarding peer work. In a study, Roskams (1999) researched the opinions of college students regarding pair work and discovered that language learners had a strong collectivist drive as well as an accomplishment orientation towards peer collaboration, probably due to the emphasis on high academic success. Although learners loved working with their peers, both an accomplishment concern and a collectivism concern influenced their opinions. Due to their concern about receiving lesser grades, several students preferred being examined individually by the members of the group rather than together as a group (Roskams, 1999).

To recapitulate, previous research has shown that engaging in collaborative writing generates social circumstances and communicative settings for L2 learners to communicate in the target language, facilitating their L2 development. The current study intends to look at the possible links between motivational writing regulation strategies and collaborative writing beliefs among undergraduate L2 writers. It sought to answer the following research questions:

1. What are the self-reported motivational writing regulation strategies of undergraduate L2 writers?
2. What are the self-reported collaborative writing beliefs of undergraduate L2 writers?
3. Do undergraduate L2 writers differ in terms of their motivational writing regulation strategies and collaborative writing beliefs based on gender or grade level?
4. What are the correlations between undergraduate L2 writers' motivational writing regulation strategies and collaborative learning beliefs?

3. Methodology

3.1. The participants and Context

Within the scope of the study, the data was collected as the learners were already conducting two collaborative tasks. Hence, the use of a collaborative beliefs survey is highly relevant. The survey was conducted after the learners finished their collaborative writing projects.

The total number of participants is 105. All the participants are college-level English language and literature students. The number of female students is 77 (67.5%) while the number of male participants is 28 (24.6%). The number of first-grade students in the present study is 26 (22.8%), second-grade students are 61 (53.5%), and third-grade students is 12 (10.5%). The first-grade participants are taking two writing courses. The second and third-grade students have already taken two writing courses. The third-grade students are also taking the "Research Techniques" course, which includes academic writing.

3.2. Data Collection Tools

3.2.1. Writing Strategies for Self-Regulated Learning Questionnaire (WSSRLQ):

The first data collection tool was the Writing Strategies for Self-Regulated Learning Questionnaire (WSSRLQ), which was developed by (Teng & Zhang, 2017) in an attempt to analyze EFL learners' metacognitive, cognitive, and social behavior strategies within the context of learning to write. This tool is a 7-point Likert scale. The options range from 1 (Not at all true of me) to 7 (Very true of me). The main theoretical background of the WSSRLQ was the self-regulation theory proposed by (Zimmerman, 2011) in addition to L2 writing theories (Cumming, 2012). WSSRLQ aims to measure L2 writers' context-specific self-regulated L2 writing strategies. Teng and Zhang (2017) validated the internal and criterion-related validity of the tool with 512 participants.

WSSRLQ contains three broad dimensions, which are (1) cognitive strategies (measured with 8 items), (2) metacognitive strategies (measured with 9 items), (3) social behavioral strategies (measured with 7 items), and (4) motivation regulation strategies (measured with 17 items). Each category includes further sub-categories. For example, text processing and course memory are sub-dimensions of cognitive processes. Ideal planning and goal-oriented monitoring are examples of metacognitive methods. Finally, social behavioral strategies include peer learning and dealing with feedback. The reliability analysis indicated that the WSSRLQ has a Cronbach's alpha value of .903, indicating that the tool is highly reliable.

3.2.2. Collaborative Learning Beliefs Survey

The second instrument used in the present study was a Collaborative Learning Beliefs Survey, which was formed by Zhai (2021). In that study, Zhai (2021) developed this survey to measure the collaborative beliefs of learners in the context of collaborative writing. There are 16 items in the questionnaires. Some of the items were adopted from Roskams (1999). The survey consists of 16 Likert-type items. The survey includes three dimensions: (1) Students' ideas about the usefulness of collaborative learning, (2) the creation of peer relationships, and (3) the execution of collaboration via students' concerns and preferences when working cooperatively. Zhai (2021) measured the reliability level of this survey as .83. In the present study, Cronbach's alpha value of the survey was measured as .68, indicating a dependable level of reliability.

4. Findings

Table 1: Descriptive statistics about cognitive statistics

Variable	Items	N	M	SD	Min	Max
Text Processing (TP)	1. I check grammar mistakes while revising.	105	5.22	1.31	1	7
	2. I check spelling and punctuation while revising.	105	5.15	1.40	1	7
	3. I check the structure for logical coherence while revising.	105	5.08	1.28	2	7
	4. I check the cohesiveness or connection among sentences while revising.	105	5.34	1.24	1	7
	5. I check whether the topic and the content have been clearly expressed while revising.	105	5.22	1.07	1	7
Course memory	1. To remember, I write useful words and expressions taught in writing courses.	105	5.01	1.17	2	7

2. To remember, I speak out useful words and expressions taught in writing courses	105	4.78	1.39	1	7
3. To remember, I read my class notes and the course material over and over again	105	4.82	1.42	1	7

Table 1 presents the findings regarding cognitive strategies. The general mean score for the cognitive strategies was calculated as 5.08, which indicates that the participants agreed with the statements. To check the normality of the distribution, both skewness and kurtosis values were calculated, and the results indicated that for all the items these values range from 0.14 and 0.868, which indicates that the data is normally distributed. To be more particular, in terms of text processing strategies, we can see from the table that the participants check the cohesiveness or connection among sentences ($M=5.34$) and check the clarity of the content ($M=5.22$). In addition, the participants also reported that they check grammar mistakes ($M=5.22$), spelling as well as punctuation ($M=5.15$). Finally, the participants also reported that they check the structure for logical coherence ($M=5.08$). When it comes to course memory strategies, it can be seen that the participants write useful words and expressions that they have learned in writing courses ($M=5.01$). However, the participants do not seem to speak out useful words and expressions that they have learned in writing courses ($M=4.78$), nor do they seem to read their class notes and the course material over and over again ($M=4.82$).

Table 2: Descriptive statistics about metacognitive strategies

Variable	Items	N	Mean	SD	Min	Max
Idea planning	1 To assist me plan, I read similar articles.	105	4.86	1.40	1	7
	2 I utilize the internet to get relevant information to aid in my planning.	105	5.88	1.17	1	7
	3 I consider the key parts of a successful composition that I've learned to assist me plan.	105	5.25	1.16	2	7
Goal-oriented monitoring	1 When I am studying English writing, I make goals for myself to help guide my learning activities.	105	4.91	1.32	1	7
	2 I monitor my English learning progress to ensure that I meet my objective.	105	4.97	1.34	1	7
	3 In writing classes, I assess my understanding of the material.	105	4.86	1.24	2	7
	4 I keep track of my learning progress when authoring courses.	105	4.64	1.25	1	7
	5 When I'm writing, I tell myself to stay on track.	105	4.92	1.38	1	7
	6 I established a learning objective to better my writing.	105	4.95	1.34	1	7

Table 2 presents the findings regarding the metacognitive strategies. The general mean score for the metacognitive strategies was calculated as 5.04, which indicates that the participants agreed with the statements. To check the normality of the distribution, both skewness and kurtosis values were calculated, and the results indicated that for all the items these values range from 0.33 and 0.789, which indicates that the data is normally distributed. Table 2 also makes it clear that the participants can use the Internet to search for required information ($M=5.88$) and can consider the essential elements of an accurate composition ($M=5.25$). However, within the context of the idea planning dimension, the participants do not seem to take advantage of reading articles for their development ($M=4.86$). As for the goal orientation dimension in metacognitive strategies, the participants do not seem to benefit from them satisfactorily. In particular, the general mean score for the goal orientation dimension is 4.85. To be more particular, the participants do not seem to stick to their plans ($M=4.95$), nor do they seem to set up learning goals for their writing ($M=4.92$). Furthermore, the participants do not seem to evaluate their mastery of the content in writing courses ($M=4.86$) and they do not seem to monitor their learning process ($M=4.64$).

Table 3: Descriptive statistics about social behavioral strategies

Variable	Items	N	Mean	SD	Min	Max
Peer learning	1. In writing classes, I brainstorm with my classmates to assist me to write.	105	4.90	1.55	7	
	2. I talk with my classmates or teachers to get new writing ideas.	105	4.39	1.72	7	
	3. I collaborate with other students in writing classes.	105	3.94	1.81	7	
Feedback handling	1. I am open to receiving critiques on my writing from my peers.	105	4.93	1.58	7	
	2. I welcome instructor criticism of my writing.	105	5.64	1.41	7	
	3. I aim to enhance my English writing depending on criticism from my classmates.	105	4.80	1.51	7	
	4. I aim to enhance my English writing based on comments from professors.	105	5.57	1.41	7	

Table 3 presents the findings regarding social behavioral strategies. The general mean score for the social behavioral strategies was calculated as 4.88, which indicates that the participants are undecided about whether they use social behavioral strategies. To check the normality of the distribution, both skewness and kurtosis values were calculated, and the results indicated that for all the items these values range from 0.23 and 1.101, which indicates that the data is normally distributed. The participants do not seem to brainstorm with their peers ($M=4.90$), discuss with their peers or teachers to generate more ideas ($M=4.39$), nor do they work with others in the writing process ($M=3.94$). Concerning feedback handling, it can be seen that the participants are eager to improve their English writing through teacher feedback ($M=5.57$). However, they do not seem to be open to peer feedback ($M=4.93$). They value teacher feedback ($M=5.64$) more than the feedback that they receive from their peers ($M=4.89$).

4.1. Findings about the Collaborative Beliefs

The second aim of the present study was to measure the collaborative learning beliefs of undergraduate L2 writers. The results are presented below.

Table 4: Students' beliefs about peer collaboration concerning the efficacy of collaboration

Items	N	Mean	SD	Min	Max	Skewness
1 Getting a good grade is more essential to me than developing a strong friendship with a classmate.	99	3,5556	1,27153	1	6	-,385
2 I believe that working with my classmates will help me improve my English.	98	4,4184	1,04461	1	6	-,637
3 If I believe my concept is superior, I disregard my partner's recommendations.	99	3,8687	1,10330	1	6	-,386
4 If I believe my proposal is superior, I attempt to persuade my partner.	99	4,0202	1,00995	1	6	-,526

Table 4 presents the findings regarding peer collaboration concerning the efficacy of collaboration. The general mean score for this variable was found 4.00, showing that the participants are undecided about the efficacy of peer feedback. A moderate number of the participants stated that their English would be improved through working with other classmates ($M=4.4184$). The participants do not foreground the idea of getting high marks in the face of having a good relationship with their peers ($M=3.5556$) and they do not seem to ignore their friends' suggestions ($M=3.8687$). What is more, most of the participants are not highly willing to persuade their peers when they think that their ideas are better ($M=4.0202$).

Table 5: Students' beliefs about students' perceptions of giving and receiving peer feedback

Items	N	Mean	SD	Min	Max	Skewness
1 I appreciate the notion of being evaluated by my partner.	99	3,9394	1,42727	1	6	-,751
2 Working with others will teach me more than working alone.	99	2,7778	1,43253	1	6	,422
3 Collaborating with others will result in a higher grade than working alone.	99	4,4343	1,03176	1	6	-,503
4 I believe that comments on my work from my peers are useful.	98	4,2653	1,07023	1	6	-1,170
5 I am not afraid of having my group member(s) criticize my work.	98	3,8265	1,20159	1	6	-,604

Table 5 presents the findings regarding students' views on giving and receiving peer feedback. As can be understood from the table, the participants do not seem to believe that working with others would lead to a better grade than working alone ($M=4.4343$) and value their peers' feedback ($M=4.2653$). The learners do not seem to value the idea of being assessed by their classmates ($M=3.9393$). They do not feel comfortable when they are criticized by their peers ($M=3.8265$). Finally, the participants do not agree that they learn more by working with others than by working alone ($M=2.7778$).

Table 6: Descriptive statistics about the preferences and concerns about the implementation of collaboration

Items	N	Mean	SD	Min	Max	Skewness
1 I am apprehensive about conflict when working with others.	98	4,2959	1,21172	1	6	-,875
2 When working with others, I'm concerned about the division of labor.	98	4,3673	1,08777	1	6	-1,368
3 I'm apprehensive about working at various speeds with others.	99	4,5960	1,15987	1	6	-,759
4 I dislike it when my group member(s) directly points out a flaw in my work (even if it is true).	99	4,1616	1,15800	1	6	-1,007
5 When working in a group, I tend to work harder than when working alone.	99	3,4848	1,26462	1	6	-,212
6 I would rather receive improvement suggestions from my teacher than from a group member (s)	99	4,1717	,99016	1	6	-,354

Table 6 presents the findings regarding the preferences and concerns about the implementation of collaboration. As we can understand from the table, they are concerned about the different working paces when working with others ($M=4.5960$) and the division of work when working with others ($M=4.3673$), and about disagreement when working with others ($M=4.2959$). Moreover, the participants do not like it being pointed out as their fault ($M=4,1616$). They would also be more satisfied when they get feedback from their teachers ($M=4.1717$). In addition, the participants do not seem to value the role of collaborative work in writing ($M=3.4848$).

Table 7: Descriptive statistics about motivation regulation strategies

Variables	Mini	Max	Mean	Sd
Interest Enhancement	1,00	7,00	5.2046	1,41951
Performance Self-talk	1,00	7,00	4.8451	1,39662
Mastery Self-talk	1,00	7,00	5.8903	1,16377
Emotional Control	1,00	7,00	4.4211	1,41365
Environment Structuring	1,00	7,00	5.3551	1,16377
Total	1,00	7,00	4.9567	1,23591

Table 7 presents descriptive statistics about motivational regulation strategies. The total mean score for the motivational regulation strategies was 4.9567, which indicated that the participants do not agree with most of the items in this category. The mean score for interest enhancement is 5.2046. This shows that the participants barely agree that They seek ways to make writing learning more enjoyable ($M=4.8190$) or find fascinating themes to practice writing in English ($M=4.8571$). However, the participants seem to agree that they relate the writing assignment to a real-life occurrence ($M=5.8762$). As for performance self-talk, the overall mean score was 4.8451. This shows that Participants in the current study express that it is critical to practice writing in English to surpass their classmates ($M=4.9709$) or desire higher marks ($M=4.9143$). Concerning mastery of self-talk, the mean score is 5.8903, which indicates that the students persuade themselves to work hard ($M=5.9044$) and urge themselves to work hard to study as much as possible through writing courses ($M=5.9233$). When it comes to emotional control, the mean score was 4.4211. This shows that L2 writers may have a hard time regulating their emotional issues and maintaining their resilience. Finally, concerning environmental structuring, the mean score was 5.3551. This shows that the participants agree that they can regulate their environment as they are conducting the writing process.

Table 8: Correlation between writing self-regulation strategies and collaborative learning beliefs

	Cog	Metacog	Sociobeh	Motreg	Collabeff	Peer feedback	implementcol
Cog	1	,691**	,378**	,634*	-,176	-,155	-,105
Metacog		1	,465**	,866*	-,113	-,013	-,010
Sociobeh			1	,839*	-,058	,066	-,050
Motreg				1	-,097	,022	-,036
Collabeff					1	,505**	,566**
Peerfeedback						1	,411**
implementcol							1

*. Correlation is significant at the 0.01 level (2-tailed). Cog= cognitive strategies, metacog= metacognitive strategies, Sociobeh= social behavioral strategies, collabeff=efficacy of collaboration, Peerfeedback=perceptions of peer feedback, implementcol=implementation of collaboration

Table 8 presents the results concerning writing self-regulation strategies and collaborative learning beliefs. Significant positive correlations were found between the sub-dimensions of writing self-regulation strategies. For instance, the correlation between cognitive strategies and metacognitive strategies was significant ($r = .70$, $p < .01$), as cognitive strategies and socio-behavioral strategies ($r = .38$, $p < .01$). Similarly, the correlation between cognitive strategies and motivation regulation strategies was also significant ($r = .63$, $p < .01$). The internal relations between the sub-dimensions of collaborative learning were also significant. For example, the correlation between the efficacy of collaboration and beliefs about peer feedback was positive and strong ($r = .50$, $p < .01$), and the correlation between the efficacy of collaboration and implementation of collaboration were also positive and strong ($r = .49$, $p < .01$). However, no significant correlations were observed between and among the sub-dimensions of writing self-regulation strategies and collaborative learning beliefs.

5. Discussion

The main aim of the present study was to measure the L2 writers' motivational writing regulation strategies concerning collaborative learning beliefs. The main finding indicated that in terms of cognitive strategies, the participants have a relatively high level of cognitive strategies along with metacognitive strategies. These findings indicate that undergraduate L2 writers can check whether their compositions are coherent enough and whether their compositions contain grammar mistakes. Similarly, the participants were also found to have a relatively high level of metacognitive strategies, implying that they can use online sources effectively and have a good command of the essential components of a composition. Nevertheless, the participants do not read more academic articles, nor can they make use of goal orientation strategies. They also reported that they do not make efficient use of goal-

setting strategies. These findings indicate that L2 writers should be instructed on how to make plans, and how to set goals and work for them. L2 instructors should spend extra time and energy cultivating these strategies.

Concerning the social behavioral strategies, the study found that the participants do not make efficient use of them. For example, the participants do not work with their peers to generate ideas, nor do they discuss with their peers to find out more about the L2 writing process. What is more, the L2 writers in the present study do not seem to be willing to get peer feedback. Similarly, concerning the efficacy of collaboration, the participants reported that they are not highly efficient in improving their L2 writing with their peers. Such findings are important given that the impact of peer feedback on students, especially higher education students, has been stressed by some authors (Barnard et al., 2015; Yu & Lee, 2016; Yu & Hu, 2017). This shows that L2 writers need more instruction and guidance in goal-setting and social behavioral strategies in general.

Even though the students ranked high in terms of cognitive writing strategies such as course memory and text processing, they ranked rather low in terms of goal-oriented monitoring aspects of metacognitive strategies and both sub-dimensions of peer learning and feedback handling of social cognitive strategies in the current study. These findings are remarkable since they indicate that L2 undergraduate writers do not seem to benefit from metacognitive and social cognitive strategies. Given that motivational regulation strategies directly affect the learning process on condition that they are activated in tandem with all cognitive, metacognitive as well as social behavioral strategies (Wolters, 2003; Zimmerman, 2011). To be more particular, Teng and Zhang (2016) demonstrated that some strategies, namely *goal-setting*, *text-generating*, *feedback-handling*, and *idea-planning strategies*, which were found to be low in this research study, significantly affect L2 writers writing performance. This study found that undergraduate L2 writers do not have a high level of goal-oriented monitoring. This finding assumes importance given that L2 writing is viewed as a "deliberate, goal-directed attempt to make writing enjoyable, less challenging, and more effective" (Teng & Zhang, 2016, p. 7). In addition, recent publications show that SRL is highly important for L2 writers. Santangelo (2016), for example, found that L2 writers perform better when they depend on several SRL strategies. Similar results were also reported by Graham et al., (2018) and Schunk & Greene (2018). Similarly, Oxford (2013) suggests that "the cognitive and metacognitive strategies facilitate understanding, increase meaningful mental associations, and are the most useful strategies for long-term retention of information" (p. 30).

One of the significant findings of the present study was that the L2 writers do not tend to benefit from the social cognitive strategies, nor, more importantly, do they seem to take benefit of collaborative learning principles. This merits some speculation given that writing is a "... social cognitive process wherein writers must be aware of readers' expectations and must be willing to devote the personal time and effort necessary to revise text drafts until they communicate effectively" (Zimmerman & Risemberg, 1997, p. 76). A viable suggestion could be to promote collaborative writing as an instructional strategy, which has come to the fore over the last few years (Chen & Ren, 2022). The main theoretical background for collaborative writing is the sociocultural theory (Vygotsky, 1978) in addition to task-based language teaching and communicative language teaching. The reason why collaborative writing could be a feasible solution to promoting collaborative teaching is that collaborative writing requires learners to engage in purposeful interaction during the writing process (Storch, 2013).

The present study found that the participants do not accept the value of or do not seem to benefit from the merits of collaborative learning. Future research is needed on why undergraduate L2 writers in Turkey do not value collaborative learning. Researchers should also clarify the role of collaboration in the development of writing skills. To do this, project-based writing strategies could be employed.

Pedagogically speaking, working on motivational strategies for L2 writing so that potentially effective methodologies could be drawn based on the results. The results frequently indicate that L2 writing teachers are supposed to make research-based decisions (Zhang, 2016), which is possible through effective handling of the topic with research studies. Furthermore, Zhou and Hiver (2022) demonstrated that the utilization of SRL strategies for L2 writing contributes to student engagement in writing classes. Therefore, as was pointed out by Dao (2020), or Zhang et al. (2016), Providing strategies-based training would be a successful technique for increasing student engagement in L2 writing.

The present study assumes significance given that it indicated that L2 writers fail to make effective use of collaborative learning strategies. Hence, L2 teachers are expected to persuade their learners that working with more knowledgeable others is a beneficial practice, as a principle of socio-cultural learning theory (Vygotsky, 1978). This means that EFL teachers are expected to teach language learners how to make use of cognitive, metacognitive, or social-behavioral strategies to consolidate their writing skills so that they can handle challenges that may emerge in the learning process.

The present study offers some insights into the relationship between self-regulated writing self-efficacy and collaborative learning beliefs. However, there are some limitations to the present study. First, the study was limited to 102 undergraduate L2 writers. Future studies could consider increasing the number of participants. Second, the present study was based on quantitative means of data collection. Future studies could consider the collection of different means of data. Third, longitudinal studies could be designed to see the role of collaboration on the self-regulated self-efficacy of undergraduate L2 writers. One fine example of longitudinal studies that focus on writing strategy use is that of Sasaki et al. (2018), who analyzed the strategy-use patterns of 37 Japanese university students over 3.5 years. Their study provided highly valuable insights. Finally, in the present study, it was not possible to include L2 writers' writing performance in the evaluation. Future studies could consider the relations between and among collaborative learning beliefs, writing self-regulated efficacy, and writing performance to get a more holistic picture.

A significant suggestion for future research would be to include context-dependency as an important factor in strategies development and strategy implementation on the part of L2 writers given that according to researchers' strategy use can be affected by contextual factors such as L2 proficiency, motivation, or environmental issues (Forgas, Baumeister, & Tice, 2009). Hence, although there is a body of research that focuses on the contextual aspects of strategy use, more focused studies are needed in that regard.

All in all, now that the language learning strategies research is experiencing a new "paradigm shift" (Dörnyei & Ryan, 2015, p. 165), where they are more frequently viewed as process-based constructs as opposed to earlier conceptualization where they were seen as "learner attributes", it is timely and beneficial to include strategies-based investigations in language skills, the writing skill being of the primary skills drawing remarkably from strategy use (Sasaki et al., 2018).

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Addressing the Works of World Literature with Radio Play Application

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Abstract

In the study, within the scope of World Literature course, radio play adaptations of works from French and Russian literatures were vocalized by pre-service teachers and tried to be presented in radio play format. In this regard, the aim of the research is to address the attitudes of pre-service teachers who experience preparing radio plays towards collaborative studies and their perception of information communication technologies competence levels. In addition, the thoughts of pre-service teachers about whether they enjoy the work of preparing radio plays, vocalizing, getting to know the work closely, and getting to know the author closely were also discussed. It is thought that the research will contribute to getting to know the literary work, the author and the characteristics of the period in which it emerged through radio plays, learning by doing and experiencing, learning permanently and with pleasure, increasing motivation and contributing to speaking skills. Because in today's education and training environments, rather than transferring knowledge, students are expected to be involved in the education and training process in which they are active, access information in creative ways, construct knowledge, learn collaboratively and interactively. In the study, qualitative and quantitative data were collected and mixed method was used. The study group of the research consists of pre-service teachers taking the World Literature course. "Cooperative Learning Scale" and "Information and Communication Technologies (ICT) Competence Perception Scale" were used as data collection tools. The findings obtained as a result of the research indicate that pre-service teachers' perceptions of collaborative studies for preparing radio plays are at a "high" level; their mean scores of ICT competence perception are at a "sufficient" level; there is no significant difference in their attitudes towards collaborative learning and their perceptions of competence in using ICT according to gender. Most of the pre-service teachers stated that it was their first time doing such an application. Regarding the qualitative findings, the students stated that they enjoyed the radio play very much, that this application contributed to them to get to know the work closely, that they had the opportunity to get to know the work more closely, and that they were curious about the other works and life of the author. More students stated that going beyond just knowing the work as a name and giving life to a character in the work ensured the permanence of the work and what was learned. They also stated that they learned about new applications related to technology through the radio play they experienced and that they saw their deficiencies related to technology.

Keywords: Radio Play, World Literature, Text Vocalization, Collaborative Studies, Teacher Candidates

1. Introduction

Radio is still an important broadcasting medium today, and radio plays are an important part of radio that entertains and informs people and allows them to have a good time. "The first regular broadcast in Turkey started on May 6, 1972 on Istanbul radio. After a while, Ankara Radio started broadcasting. As in the rest of the world, radios were broadcasting theater plays during the Representation Hour" (Duruel, 2014: 57). Although Lord Asa Briggs said that some of Shakespeare's classics were broadcast on the BBC on February 16, 1923, it is generally accepted that British dramatist Richard Hugs' *A Comedy of Danger*, broadcast on January 15, 1924, was the first radio play (Özden, 1997: 7).

Radio plays are a field intertwined with literature. Radio plays, like works of literature, develop the imagination. It offers its readers and listeners, whom it addresses not visually but visually, opportunities such as imagining the heroes, events and places in the work, enriching their world, getting to know even unread works closely, empathizing, and meeting new people. As Özdemir (2017) states, "Literature enriches the world of imagination. The events and people in novels come alive in our minds. Radio theater is closer to the novel. When listening to radio theater, it is as if you have lived the event. It is an art of speech and sound that requires mastery of sound art in terms of the use of sound as a field with artistic value and cultural value" (p. 9-10). Radio play is a field that makes important contributions to cultural life. It would be a different practice for students who are not accustomed to the traditional and only appealing to the ear and who are familiar with new media tools to get to know the work closely in an educational environment and to use it in a way that contributes to the development of verbal communication skills. In the literature, studies aiming to show the usability of radio plays in the development of verbal communication skills have been carried out, albeit to a lesser extent. It is possible that radio plays can be used to develop listening and speaking skills in courses such as Turkish and literature where verbal communication is predominant. In the special field competencies of teachers adopted by the Ministry of National Education in 2011, the article "developing students' critical and creative thinking, decision-making and problem solving skills" was included. Developing technology and changing social structure necessitates critical reading, thinking, using information and communication technologies (ICT) and a perspective in this direction. Therefore, it is a necessity of our age that pre-service teachers studying in faculties of education develop their attitudes towards critical and creative thinking, communication, problem solving, research, decision making and using information technologies in a positive way and incorporate technology into their lessons. Through radio plays, works of Turkish literature, works of world literature, works of children's literature are learned, known and recognized by large masses.

The aim of the study is to examine the attitudes towards collaborative studies and the levels of information communication technologies competence perceptions of pre-service teachers who experience preparing radio plays. In addition, pre-service teachers' thoughts about preparing a radio play (vocalization, getting to know the author and the work closely) were also discussed. For this purpose, the following questions will be tried to be answered in the study.

1. At what level are the attitudes of pre-service teachers who experience preparing a radio play towards cooperative learning?
2. What is the level of pre-service teachers' perceptions of competence in using Information Communication Technologies (ICT)?
3. Is there a significant difference between pre-service teachers' attitudes towards cooperative learning and their perceptions of competence in using information communication technologies (ICT) according to gender?
4. Write your thoughts about the contributions or negativities of the radio play to you under the headings below:
 - a) Enjoying the work done
 - b) On vocalization/speaking
 - c) To get to know the work closely
 - d) To get to know the author closely

2. Method

In this section, information about the purpose, importance, model, study group, data collection and analysis of the study is given.

2.1 Research Model

In the study, mixed method was used, which integrates the results of the research by using quantitative and qualitative data collection methods together. The purpose of using qualitative and quantitative research methods together in the same study is to increase the advantages and decrease the disadvantages of qualitative and quantitative research (Creswell, 2003).

2.2 Study Group

The research was conducted with sixty pre-service teachers from the Faculty of Education who took the World Literature course and answered the survey questions completely.

2.3 Data Collection Tools

Quantitative and qualitative data were collected in the study. "Personal Information Form", "Cooperative Learning Scale" developed by Kiper (2016), "Information and Communication Technologies Competence Perception Scale for Prospective Teachers" developed by Şad and Nalçacı (2015) were used to collect quantitative data.

2.3.1 Quantitative Data Collection Tools

2.3.1.1 Cooperative Learning Scale

The "Cooperative Learning Scale" developed by Kiper (2016) consists of 20 items. Of these 20 items, 11 are positive and 9 are negative. In the evaluation of the positive items, "Strongly Agree" (5), "Agree" (4), "Undecided" (3), "Disagree" (2), "Strongly Disagree" (1), while in the evaluation of the negative items, a five-point Likert-type scale with "Strongly Agree" (1), "Agree" (2), "Undecided" (3), "Disagree" (4), "Strongly Disagree" (5) points was used. Cronbach Alpha coefficient was calculated to reveal the reliability of the scale. The Cronbach Alpha value of the scale was calculated as 0.924.

2.3.1.2 Information and Communication Technologies Competence Perception Scale for Prospective Teachers

Another scale used in the study is the scale developed by Şad and Nalçacı (2015) Prospective Teachers' Perceived Competencies about Integrating Information and Communication Technologies into Education. The scale form is organized in likert format with 5-point scale ranging from 'I am quite competent' to 'I am quite inadequate'. In order to reveal the reliability of the scale, Cronbach Alpha coefficient was calculated. The Cronbach Alpha coefficient of the scale was found to be ,964. The scale consists of 30 items.

2.3.2 Qualitative Data Collection Tools

2.3.2.1 Semi-structured Interview Form

Within the scope of the qualitative dimension of the research, the thoughts of the pre-service teachers who experienced preparing a radio play about enjoying the work, vocalizing, getting to know the author and the work closely were discussed. For this purpose, a semi-structured interview form consisting of four open-ended questions was prepared by the researcher. In order to ensure the internal validity of these questions, the opinions of field experts who completed their doctorate in the field of Turkish Language Literature Education were taken. The semi-structured interview questions asked to the prospective teachers are as follows:

1. Write your thoughts about the contributions or negativities of the radio play to you under the headings below.
 - a) In terms of enjoying the work done
 - b) On vocalization/speaking
 - c) To get to know the work closely
 - d) To get to know the author closely

2.4. Data Analysis

The quantitative data obtained in the study were analyzed using descriptive statistics such as percentage, frequency and arithmetic mean; qualitative data were analyzed using content analysis. With content analysis, it is tried to define the data and to reveal the facts that may be hidden in the data. The basic process in content analysis is to bring together similar data within the framework of certain concepts and themes and to organize and interpret them (Yıldırım & Şimşek, 2006). The Kolmogorov Smirnov test was used to check whether the numerical variables were normally distributed. The data show normal distribution.

2.5 Radio Play Implementation and Planning

In the study, radio play adaptations of works from French and Russian literatures are discussed within the scope of world literature. These play adaptations given below were vocalized by the students within the scope of the World Literature course and tried to be presented in radio play format.

Radio Play Adaptations and Responsible Works:

Group 1: The Little Prince adapted from Antoine de Saint-Exupery's work of the same name

Group 2: The Inspector based on N.Gogol's work of the same name

Group 3: A.Chekhov's play The Wedding

Group 4: A.Chekhov's Anniversary Celebration was distributed to the groups according to the class size, with a narrator and the people in the work.

The weekly practices carried out during a lesson period are given below.

2.6 Process and Implementation

Week 1 (14.02.2022) Teacher candidates were informed about the content of the study. Information about the radio play, adapted works, radio play-literature relationship was given.

Week 2 (21.02.2022) Radio play, the period of radio plays to be discussed, works, radio play-literature relationship continued to be explained. Information about the radio play was given and its relationship with verbal communication was mentioned.

Week 3 (28.03.2022) The works and the number of people to be performed by the teacher candidates were determined and the subjects were distributed to the class. The prospective teachers were asked to share their roles and read the works.

Week 4 (07.03.2022) Technical information about the realization of the radio play, programs related to vocalization, sound editing, etc. Sample radio plays were sent to prospective teachers.

Week 5 (14.03.2022) Teacher candidates came together and started rehearsals.

Week 6 (21.03.2022) Teacher candidates listened to the radio play samples sent to them and made evaluations by getting to know the work they were responsible for more closely.

Week 7 (28.03.2022) Teacher candidates came together and continued to read and rehearse.

Week 8 (04.04.2022) Sources for the works they used in their studies were sent.

Week 9-10 (11.04.2022-18.04.2022) Teacher candidates continued to read and rehearse together.

11.-12.Week (25.04.2022-02.05.2022) The prospective teachers were asked to follow the plays of their other groupmates.

13.-14.Week: (09.05.2022-16.05.2022) The prospective teachers' radio plays were analyzed and evaluated.

3. Findings And Interpretation

In this section, the findings related to pre-service teachers' perceptions of Information and Communication Technologies (ICT) competence and Cooperative Learning Attitude levels are presented.

3.1 Findings Related to Quantitative Data

Table 1: Normal distribution values for total scores of cooperative learning scale, information and communication technologies (ict) competence perception scale

	Kolmogorov-Smirnov			Skewness	Kurtosis
	Statistics	Sd	p		
Cooperative Learning Scale	0,10	60,00	0,18	-0,63	1,15
Information and Communication Technologies (ICT) Competence Perception Scale	0,07	60,00	0,20	-0,14	-0,53

In order to determine the analyses to be selected to test the hypotheses, it was checked whether the data were suitable for normal distribution. The data obtained from the Shapiro-Wilk normality tests with a significance level greater than 0.05 showed a normal distribution, and the kurtosis and skewness values were between ± 2.0 (George & Mallery, 2010) and the values did not deviate excessively from the normal distribution.

In order to answer the first problem of the study, "What is the level of the attitudes of the pre-service teachers who realized the radio application towards cooperative learning?", the results of the total scores and descriptive statistics of the pre-service teachers are shown in Table 2 and Table 3:

Table 2: Arithmetic mean, standard deviation, minimum and maximum values of prospective teachers' attitude scores towards cooperative learning

	N	Min	Maks.	Average	Standard Deviation
Cooperative Learning Scale	60,00	33,00	96,00	71,12	12,38

According to the results in Table 2, the mean score of the pre-service teachers on the cooperative learning scale is 71.12, the standard deviation is 12.38, the highest score is 96, and the lowest score is 33. In order to determine the level of participation from the scores obtained from the scales, the group width value was evaluated using the formula $4/5=0.80$. For this purpose; 1.00-1.80 was taken as "very low level"; 1.80-2.60 as "low level"; 2.60-3.40 as "medium level"; 3.40-4.20 as "high level"; 4.20-5 as "very high level". The result of the division of the total score of the pre-service teachers by the number of items is 3.55 and it can be said that their attitudes towards cooperative learning are at "high" level.

Table 3: Descriptive results of cooperative learning levels for prospective teachers

	Level	n	%
Cooperative Learning Scale	Strongly disagree	1	1,7
	Disagree	3	5,0
	Undecided	19	31,7
	I agree	31	51,7
	Absolutely agree	6	10,0

According to the mean scores obtained from the cooperative learning scale, 51.7% (n:31) of the pre-service teachers were at the "agree" level and 31.7% (n:19) were at the "undecided" level.

In order to answer the second problem of the study, "What is the level of pre-service teachers' perceptions of competence in using Information Communication Technologies (ICT)?", the total scores and descriptive statistics of the pre-service teachers were calculated. The related results are shown in Table 4 and Table 5.

Table 4: Arithmetic mean, standard deviation, minimum and maximum values of preservice teachers' perceptions of competence in using information communication technologies (ict)

	N	Min	Maks.	Average	Standard Deviation
Information and Communication Technologies (ICT) Competence Perception Scale for Prospective Teachers	60,00	88,00	149,00	120,41	16,24

The average total score of the ICT competence perception scale for pre-service teachers was 120.41 ± 16.24 , with a minimum score of 88 and a maximum score of 149.

In order to determine the level of participation from the scores obtained from the scales, the group width value was evaluated using the formula $4/5 = .80$. For this purpose; 1.00-1.80 was taken as "very low level"; 1.80-2.60 as "low level"; 2.60-3.40 as "medium level"; 3.40-4.20 as "sufficient level"; 4.20-5 as "quite sufficient level". It can be said that pre-service teachers' perceptions of competence in using Information and Communication Technologies (ICT) are at the "sufficient" level with the result 4 related to the number of items divided by the total score.

Table 5: Descriptive results of information and communication technologies competency levels for prospective teachers

	Level	N	%
Information and Communication Technologies (ICT) Competence Perception Scale for Prospective Teachers	Undecided	10	16,9
	I agree	29	49,2
	Strongly agree	21	33,9

In Table 5, the perception levels of Information and Communication Technologies (ICT) competence of pre-service teachers are shown as follows: 49,2% of them are adequate, 16,9% of them are partially adequate, 33,9% of them are quite adequate.

According to the mean scores obtained from the Information and Communication Technologies (ICT) competence perception scale for pre-service teachers, it was determined that 49,2% (n:29) of the pre-service teachers were at the level of "agree" and 33,9% (n:20) were at the level of "strongly agree".

In order to answer the third problem of the study, "Is there a significant difference between the attitudes of the pre-service teachers who realized the radio application towards cooperative learning and their perceptions of competence in using information communication technologies (ICT) according to gender?", the total scores and descriptive statistics of the pre-service teachers were calculated. Related results are shown in Table 8.

Table 6: Comparison of cooperative learning and information and communication technologies (ict) competency levels by gender

	Gender	n	$\bar{X} \pm SS$	t	sd	p
Cooperative Learning Scale	Male	11	$3,74 \pm 0,40$	1,07	58	0,29
	Woman	49	$3,52 \pm 0,65$			

Information and Communication Technologies (ICT) Competence Perception Scale for Prospective Teachers	Male	11	4,09±0,52	0,54	57	0,59
	Woman	49	4,00±0,55			

As seen in Table 6, the scores of pre-service teachers' cooperative learning attitude, information and communication technologies scale do not show a statistically significant difference according to gender ($p>0.05$).

3.2 Findings Related to Qualitative Data

The findings obtained as a result of analyzing the radio plays put forward by the pre-service teachers with the content analysis method are given below.

1. *Fifty-seven pre-service teachers stated that they enjoyed the work and had a lot of fun with the question "whether they enjoyed the work":* Examples of these students' thoughts are as follows:

Table 7: Did you enjoy the radio play application? Answers Related to the Question

Whether you enjoy the work or not	f
Yes, I enjoyed it.	57
No, I did not enjoy it.	1
Partially enjoyed it.	2

a. In addition to the difficulty of working as a group, i.e. collaboratively, there were students who stated that it was enjoyable to work in unity and solidarity to produce a good product:

- It was very nice to do a collaborative work. I had the opportunity to get to know people I did not know in the class. S4
- I had never done such a study before. For this reason, we carried out the study with great pleasure. In addition, this study gave us the opportunity to spend a pleasant time with the people in the group. S7
- It was a lot of fun to perform the book as a group. It was a very different experience for us to listen to the latest version of the book from different voices. S14
- I enjoyed it. I understood the importance of cooperation better. I enjoyed giving the emotions of the character. S21
- I enjoyed it. I found that we would improve ourselves at every moment of the process, including the parts I read. I also had the opportunity to further develop my sense of responsibility through cooperative work. S23

b. The opinions of those who stated that new information about record organization and technology was useful and exciting are as follows:

- I enjoyed it. I learned new sites and applications that I can use in the future. It was fun to prepare. S48
- Yes, it was fun. Since I am very good with the computer and I like it very much, the recording editing part was good for me. S56

c. The opinions of the students who stated that it was enjoyable to feel those emotions and empathize with them by taking on other roles and therefore enjoyed the practice:

- It was a very enjoyable work. It was very fun to feel and vocalize by getting into other roles. I couldn't help thinking that I wish I had such a profession. S5
- I really enjoyed the radio play work we did. When we read our comedy play on our own, it didn't seem funny, I wasn't very impressed. We had a lot of fun recording it when we performed it. We couldn't stop laughing most of the time, especially when there were sound effects. S8
- Yes, I bought it. It was very enjoyable for me to take part in a play by Gogol, one of the masters of World Literature, especially playing the role of Andreyevna, the wife of the inspector. S27

- Yes, it is. It was a different and beautiful study. S29

d. The views of the student who stated that he partially enjoyed the study:

- Since it was quite difficult to gather the group, frankly, it was not a process that I enjoyed too much. However, the application part was quite fun. No one wanted to make sacrifices in the first process, which frankly cooled me down against the homework. S20
- I partly enjoyed this work I did because it was a tiring work, but on the other hand, we produced a fun and different work product with my group. While voicing or listening to the Inspector play, I witnessed that the characters in the content of the book were ridiculous and the humorous aspects of the events were skillfully handled. Especially the dialogues of the character who deceived the officers disguised as an inspector were enjoyable and gripping. S40

e. The opinions of the students who stated that it was very enjoyable to present a favorite book as a radio play:

- Yes, I did. It was very nice to revive my favorite book. S47
- Yes, I had a lot of fun doing our work. I especially enjoyed doing the audio theater of a book I love. I also played the flower as a character. The sentences of this character affected me a lot when I read the book. Therefore, it was a pleasant work for me. S59

f. The opinions of the students who stated that doing such a study for the first time and using their voices was an exciting and enjoyable practice are as follows:

- I enjoyed it. It was enjoyable for me to reflect and vocalize the emotional states of the characters. S15
- Yes, because it was a nice aspect to feel like a hero of the book. Being like living that moment during the vocalization stage was my favorite stage. S17
- Yes, I had a great pleasure in our radio play work, because The Little Prince is a very well-known and admired work. It was very enjoyable for me to voice a character from such a beautiful work.
- Yes, I enjoyed the work we did. I enjoyed the vocalization part the most. Because we tried to give the emotion in that part. S26

2. Did vocalization/speaking give you pleasure? Why? In what ways did you feel incomplete or comfortable?
Five students gave negative answers to the question and four students gave partial answers. The students who expressed that they enjoyed the study expressed that they sometimes experienced uneasiness about getting stuck and making the wrong vocalization.

Table 8: Did you enjoy voiceover in the radio play application? Why? In which ways did you feel incomplete or comfortable?

Did vocalization/speaking give you pleasure? Why? In which ways did you feel incomplete or comfortable?	F
Yes	51
Partially	4
No. I had a hard time	5

a. The opinions of the students who stated that they enjoyed it are as follows:

- I enjoyed it very much. I am already successful in such activities. I believe that I enter the role well and reflect it both vocally and physically. S4
- It gave me pleasure. The point where I felt incomplete was portraying a male character. But in general, it was an enjoyable job. S49
- Yes, it was quite enjoyable. Especially vocalization made me feel like I was in the play. In my first vocalization experience, I was afraid of not being able to integrate with the character in the work and not reflecting that emotion. S57

b. Opinions of the student who stated that he/she partially enjoyed it:

- I can say that I partially enjoyed it. I tried to give emotion in the parts where I had dialogues. And it was little hard. S22

3. *Did the radio play practice contribute to getting to know the author's work closely? In which ways? Did the radio play application contribute to getting to know the author's work closely? In which ways? In response to the question, the majority of the students stated that they got to know the work more closely and in depth. The opinions regarding this are as follows:*

Table 9: Did the radio play application contribute to getting to know the author's work closely? In which ways?

Answers to the question

Did the radio play application contribute to getting to know the author's work closely? In which ways?	F
Yes, it did.	56
Partially provided.	2
No it did not.	2

a. *Some of the opinions of the students who stated that they understood the work better and that it was better memorized because they vocalized it are as follows:*

- I became curious about Anton Chekhov's other works. It awakened the desire to research Russian literature and contributed a lot to me. I had the opportunity to learn who is in Russian literature, which works were written, and what kind of path literature followed in Russia at that time. S4
- I was very happy to have the opportunity to meet the piece. Since we performed this piece, I think that the piece has a very special place in my mind and heart. S7
- "The Anniversary Celebration" was the first work of Anton Chekhov I ever read. I never laughed when I read it, but I laughed so much when my friends acted it out that the sound recording was disrupted because of me. If I had read this work as a plain text, I would not have enjoyed it. With the radio play application, I discovered that it has funny sides. S8

b. *The opinions of the students who stated that they had left the work unfinished or had not read it before and that they had information about the work with this radio play application are as follows:*

- Yes, it contributed. Because although I had knowledge about the work, I had not had the opportunity to read the work from beginning to end. S16
- Of course they contributed to getting to know the work. With the radio play we prepared, I think it became impossible to forget the work, its fiction and its characters. S28

c. *The opinions of the students who stated that they reached a certain idea about the language and style of the work are as follows:*

- I think I have more permanent knowledge about the style of Anton Chekhov's plays. S2
- Of course it did. It allowed us to get to know the author's style and feelings closely. S21

d. *The opinions of the students who stated that they understood the characters in the work better are as follows:*

- Yes, it provided this opportunity. First of all, the explanations about the characters in the work helped me to get to know the characters more clearly and thus to make sense of the character's behavior and words more easily throughout the work. S29
- I had the opportunity to examine the work better. It enabled me to analyze the characters in the work better. S47
- Yes, I was able to have an idea about how he constructed the characters and I was able to understand the author's imagination with the help of the voiceover.

4. *Did the radio play application contribute to getting to know the author better? In which ways? Answers to the question*

Table 10: Did the radio play application contribute to getting to know the author better? In which ways?

Did the radio play application contribute to getting to know the author better? In which ways?	F
Yes it did.	40

Partially provided.	12
No it did not.	8

The statements of the students who stated that they did research on his life and other works are as follows:

- Yes, definitely. I can say that Chekhov managed to be the writer who interested me the most. It is impressive that he is the greatest short story writer besides his identity as a physician. His stories and plays are quite beautiful. In addition to his numerical intelligence, I was very impressed by his verbal success and his interest in literature. S4
- In the course of the course, we talked about the humorous criticism of Gogol. However, it was not possible for me to witness this aspect of the author without reading a work completely. I could not get to know the author closely, but I felt some aspects I knew about the author more clearly in his writing. S30
- I found out that the author was a pilot and a French citizen and that he wrote works such as Night Flight S41
- Yes, it did. Because I also tried to research and learn about the author of the book we were vocalizing. In addition, the work written by the author and the style of the work gave us a clue about many features of the author. S58

4. Conclusion

Today, developing technology, new communication technologies and media tools are important in education as in all fields. Technology and new media tools replace traditional and classical methods in education. Sometimes traditional and outdated practices can be revived and made functional with new technology and media tools. As a matter of fact, as Göçer and Kurt (2020) reported in their study, "It is seen that radio play recordings are available on different platforms such as Spotify, SoundCloud, YouTube Music, radio plays are vocalized and continued in accordance with today's technologies.

In the study, pre-service teachers carried out an application to get to know the adapted works of world literature closely by working collaboratively, using technology, and using verbal communication skills through a radio play. There are various studies on radio plays in the literature. For example, Cankaya (2011) in his study titled "A disappearing broadcast format: Radio drama", Cankaya (2011) discussed the reasons for the disappearance of this type of radio program in Turkey and made evaluations about it. Ayvaz (2016), in his study titled "Behçet Necatigil and Radio Plays", gives information about the characteristics of radio plays and Behçet Necatigil, one of the important names of this genre and radio plays. Karadağ (1976), in his study titled "Radio Theater Education", mentioned the stages of the radio play and provided information about it. Doğan (2007), in his study titled "Changing radio listening habits in Turkey and radio theater in private radios", examined radio play broadcasts. These studies can be multiplied. However, within the scope of our study, it would be more appropriate to look at the studies on the inclusion of radio plays in education. In the literature, there are few studies on the use of radio plays in education. The first of these is a theoretical study conducted by Göçer and Kurt (2020), "The Theoretical study on the use of radio plays in the development of verbal communication skills". In addition, Miçooğulları (2021), "Listening Skills in Teaching Turkish to Foreigners: TRT Dinle and Radio Dramas as Authentic Materials", radio theater was played as an activity to improve the listening skills of foreign students learning Turkish.

The results obtained from the radio play application, which is the subject of this study conducted by pre-service teachers, indicate that pre-service teachers' perceptions of collaborative work for preparing a radio play are at a "high" level, and the mean scores of information and communication technologies competence perception for pre-service teachers are at a "sufficient" level. It can also be said that there is no significant difference between their attitudes towards cooperative learning and their perceptions of competence in using information communication technologies (ICT) according to gender. Most of the pre-service teachers stated that they were doing such an application for the first time. Regarding the qualitative findings, the students stated that they enjoyed the radio play very much, that this application contributed to them in getting to know the work closely,

that they had the opportunity to get to know the work more closely, and that they were curious about the author's other works and life. More students stated that going beyond just knowing the work as a name and giving life to a character in the work ensured the permanence of the work and what was learned. They also stated that they learned about new applications related to technology through the radio play they experienced and that they saw their deficiencies related to technology.

As in this study, the practices and activities to be carried out for collaborative work, the use of technology, and the development of verbal communication skills in lessons aimed at getting to know literary works and the period closely attract the attention of students at all levels of education and make learning enjoyable. Studies similar to these practices can be carried out at all levels of education.

Ethics Committee Permission

The data collection tools were submitted to the Ethics Committee of Kütahya Dumlupınar University and it was stated that the study was in compliance with research and publication ethics with the decision presented below:

Board name = Kütahya Dumlupınar University Rectorate, Social and Human Sciences Scientific Research and Publication Ethics Committee

Date of decision= 15.02.2022

Document number number= E.78513

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Student Evaluation of the Features of Learning Management Systems Used by Universities in Distance Higher Education

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Abstract

The aim of this study is to examine the opinions of university students in higher education institutions during the COVID-19 pandemic period about the basic features that a learning management system (LMS) should have, in nine dimensions: communication and interaction, productivity tools, collaboration tools, management tools, course delivery tools, content development tools, hardware compatibility, reporting, and language support). A total of 125 university students studying in different faculties and departments of 12 universities in various regions of Turkey participated in the study. The data were collected using various social media tools via a questionnaire prepared in Google Forms. According to the results of the study, although some students stated that they did not have any knowledge about the features of the LMS that they used, they stated that they were able to use all the features of the LMS effectively. The percentage of students who expressed a positive opinion about the nine features of the LMS they used varied between 36.8% and 53.6%. Some students also stated that they had no knowledge of the features of the LMS they used. The results of this study reveal that there is still a lack of knowledge and use regarding the functions of LMSs used by students. These results highlight the importance of making more effective use of LMSs, which play an important role in distance education.

Keywords: LMS, Higher Education, Distance Education, University Students

1. Introduction

In consequence of the COVID-19 epidemic, which was declared a global pandemic, courses at all levels of education began to be taught remotely in Turkey as well as all over the world, and this became a model of education. Distance education is an educational system in which students and instructors are in different geographical locations, and in which the transmission of course materials and interaction are carried out simultaneously (synchronously) or at separate times (asynchronously) by utilising a technological tool such as a telephone or computer.

Due to the COVID-19 pandemic, the education system has been oriented towards similar alternative education methods, especially web-based instruction (WBI) (İbili, 2009). For the efficiency and effective management of this virtual education, there is a need for software applications named Learning Management Systems (LMSs) that track, administer and report the activities between the user and the teaching materials (Lonn&Teasley,2009).

There are different definitions of the LMS in the literature. In general terms, the LMS is a software that uses internet technologies to plan, evaluate and implement the teaching process in the distance education process (Paulsen & Keegan, 2002). Similarly, LMS is defined as an education management system designed to present, track, measure and report distance education content for users (Oakes, 2002).

Different types of LMS are available. Some of the simultaneous (synchronous) LMSs are BigBlueButton, Elluminate, Adobe Connect, Open Meetings, and Dimdim; some of the asynchronous LMSs are Moodle, Dokeos, Mambo, TinyLMS, OLAT, and ATutor. Among these tools, synchronous tools used extensively in higher education are webex, Zoom, viber, messenger, Microsoft Teams, Blackboard Collaborate, BigBlueButton, Google Meet, and Adobe Connect (Trapali *et al*, 2022)

Each LMS has different features. The basic features that should be found in a learning management system are categorised in different ways in different sources. Following a literature review, Sezer (2019, p.37) summarised the features that a learning system should have, and gathered them under three main headings: 1) Learning tools (communication, productivity, student participation), 2) Support tools (management, course delivery, curriculum design), and 3) Technical features (hardware/software, pricing). Gültekin (2018, pp.17-20) reported the features of different LMSs in a thesis study, and specified the criteria related to each feature in the category: technical features, course and assessment features, communication features, content features, management features, content features, management features, support features, language features.

According to Martin, Quigley and Rogers (2005), the LMS should enable all the following features: logging into the system, all student-related processes to be performed electronically, conducting tests and exams and taking attendance online, conducting online discussion forums, publishing course content online, rapid communication between instructors and students, easy checking of student homework by the instructor, and reporting educational activities.

The LMS should have the following features: 1) Defining and managing users, 2) Preparing course contents, 3) Managing courses, 4) Assigning/delivering homework and projects, 5) Preparing and implementing exams and tests, 6) Tracking and examining student behaviour in order to observe how effectively the system is used, and 7) Discussion groups, chat rooms, fluid video and audio transmission, use of interface technologies such as Flash in the creation of interactive communication environments, and management of these environments (Al & Madran, 2004; Chahal & Patel, 2021)

Universities not only purchase LMS services such as ALMS, Blackboard and Enocta from private companies, but also use open source code LMS systems such as Moodle and Canvas, which they adapt within their own structure (Kocatürk, Kapucu & Uşun, 2020). Each LMS has features that are superior to and weaker than others. These features have an important role in the selection of the LMS to be used. In terms of evaluating the system, it is important to obtain the opinions of students and instructors about the distance education platform in universities (Kant, Prasad & Anjali, 2021). When the literature on the use of learning management systems in higher education is examined, the studies generally focus on determining users' attitudes, usability and user satisfaction levels regarding LMSs (Asıcı, 2018; Chan, Botelho & Lam, 2021; Chien-Yuan, & Cheng-Huan, 2022; Çevik, 2021; Dİlfruz, 2019; Kestel, 2020; Kılınç, 2022; Hamutoğlu & Kıyıcı, 2017; Horvat, Dobrota, Krsmanovic & Cudanov, 2015; Sarıkaya, 2021; Saygılı, 2021; Servidio & Cronin, 2018; Sezer, 2019). Some studies have aimed to develop an educational LMS in line with needs and to compare the features of the newly developed LMS with different LMSs (Baimurzayev, 2016; Taşkesenligil, 2021). However, in the related literature, there is no study examining users' opinions about the features that an LMS should have.

Previous studies in the literature show that LMSs used during the COVID-19 pandemic period were found to be inadequate by both educators and students (Can & Köroğlu, 2020). This may be because the features of the LMS chosen for use by the higher education institution did not meet the users' objectives. In order to ensure the continuity of LMS usage, it is necessary to determine the degree of user satisfaction with the system after they have used the system (Çevik, 2021). The aim of this study is to examine whether university students in higher education institutions have positive opinions about the basic features that an LMS should have during the COVID-19 pandemic period. The research questions of the study are:

- 1) What are the opinions of university students about the effective use of learning management systems?
- 2) What are the thoughts of university students about the features of learning management systems?

2. Method

In this study, a mixed research model was used. This is both a qualitative and quantitative study. Both questionnaire and semi-structured interview questions were used to investigate university students' evaluations of learning management systems (LMSs).

2.1 Participants

A total of 125 university students from 12 universities in the Eastern Anatolia, Central Anatolia, Black Sea, Western Anatolia, Aegean and South-eastern Anatolia regions participated in the study. These students are studying in various departments of the faculty of engineering, faculty of education, faculty of fine arts, faculty of science and literature, faculty of theology, faculty of economics and administrative sciences, and faculty of pharmacy. 71.2% (N=89) of the students are female and 28.8% (N=36) are male.

2.2 Data Collection Tools

The questionnaire used in this study comprises three parts. The first part consists of seven questions designed to learn the students' demographic information (name of university, faculty/department, gender, LMS used by the university, name of the synchronous platform used, how LMS-related training was received, and degree of satisfaction with the LMS-related training). In the second part of the questionnaire, there are two statements about the use of LMS features, while in the third section of the questionnaire, there are nine statements for which students are asked to indicate whether or not they feel positive about the features of the LMS. In this study, the LMS features were modelled on the LMS features that Baimurzayev (2016, pp.35-37) examined in nine categories as a result of a detailed literature review. Based on the assumption that participants might not have enough knowledge about the features of the LMS modules, short explanatory texts about the content of each module were prepared. For the construct and content validity of the prepared questionnaire, the opinions of an expert academician in the computer and instructional technologies department were sought, and as a result of the feedback received, some revisions were made to the module contents and the explanatory texts related to the modules. In order to test the understandability of the questions, a pilot study of the draft questionnaire was conducted with five students, and the final questionnaire was created according to the feedback received. The scores in the second part of the questionnaire were coded as "1= strongly disagree", "2= disagree", "3= undecided", "4= agree" and "5= strongly agree", and the participants were asked to indicate their degree of agreement with the given statements. In the third part of the questionnaire, the answers were coded as "0= no knowledge", "1= strongly disagree", "2= disagree", "3= undecided", "4= agree" and "5= strongly agree".

2.3. Data Collection Procedure

Since the data were collected during the pandemic, the questionnaire, which was prepared electronically through Google Forms, was delivered to the participants with the snowball method using social communication tools such as Instagram, WhatsApp and e-mail. The consent form, in which participants were informed about the purpose and process of the study, was also sent along with the questionnaire.

2.4. Data Analysis

Item analysis was performed for each question item in the questionnaire, and in the first part of the questionnaire, the number and percentage were calculated for each answer given to the questions related to demographic information. For the data analysis of the second and third parts of the questionnaire, the percentages for "strongly disagree (1)" and "disagree (2)" from the responses given by the participants were combined and interpreted as "negative". Similarly, the percentages for "strongly agree (5)" and "agree (4)" statements made by the participants were combined and interpreted as "positive".

3. Results

3.1. Effective Use of the LMS

Over half of the students (62 %) stated that they knew all the features of the LMS used in their university. Almost a quarter of them (23%) were undecided. A considerable percentage of students (15%) stated that they did not know all the features of the LMS, while 36% stated that they could not effectively use all the features of the LMS in their university or were undecided on this issue. When the students were asked whether they had received any LMS-related training, 42 students (33.6%) reported that they had not received any such training. According to the analysis of the responses given to the question in which students who had received LMS-related training were asked to express the adequacy and effectiveness of this training, 30 students (24%) stated that they did not find the training adequate or effective (Table 1).

3.2. Features of the LMS

Whereas only 40% of the students agreed with the statement, *“I have a positive opinion about the features of COMMUNICATION AND INTERACTION TOOLS of the LMS used in our university”*, the number of students who disagreed with this statement or were undecided was 63 (50.4%). The number of students had no knowledge of the communication and interaction features of the LMS was 12 (9.6%) (Table 2)

While more than half of the students (53.6%) agreed with the statement, *“I have a positive opinion about the features of PRODUCTIVITY TOOLS of the LMS used in our university”*, 13.9% stated that they disagreed.

Regarding the statement, *“I have a positive opinion about the features of COLLABORATION TOOLS of the LMS used in our university”*, almost one fifth (18.4%) of the students stated that they did not have a positive opinion of this feature of the LMS, while 13.6% stated that they had no knowledge of this feature of the LMS.

Almost half of the students (48%) agreed with the statement, *“I have a positive opinion about the features of MANAGEMENT TOOLS of the LMS used in our university”*. On the other hand, a similar percentage (44.8%) of the students had a negative view of this feature of the LMS.

Almost half of the students (45.6%) agreed with the statement, *“I have a positive opinion about the features of COURSE DELIVERY TOOLS of the LMS used in our university”*. Over half of the students (54.4%) either stated that they did not know about this feature of the LMS they used, had a negative opinion of this feature, or were undecided about whether this feature was positive or not.

Regarding the statement, *“I have a positive opinion about the features of CONTENT DEVELOPMENT TOOLS of the LMS used in our university”*, a few of the students (11.2%) stated that they had no knowledge of this feature of the LMS. On the other hand, only 40% of the students had a negative view about this feature of the LMS.

It was determined that one fifth (20.8%) of the students disagreed with the statement, *“I have a positive opinion about the HARDWARE COMPATIBILITY features of the LMS used in our university”*.

Regarding the statement, *“I have a positive opinion about the REPORTING TOOLS feature of the LMS used in our university”*, this was the feature that had the second highest percentage of student agreement (52.8%) among all the LMS features.

Almost half of the students (46.4%) agreed with the statement *“I have a positive opinion about the LANGUAGE SUPPORT feature of the LMS used in our university”*. Almost a quarter of the students stated that they had no knowledge of this feature of the LMS. On the other hand, 12.8% of the students declared that they had a negative opinion about the language support feature of the LMS.

Table 1: Items Related to Use of LMS Features , Percentages of Participants' Answers to Items of the Questionnaire in Part 2

Part 2	Items related to use of LMS features	Disagree (-)	Agree (+)	Undecided (3)
1	I know all the features of the LMS used in our university.	15 %	62 %	23 %
2	I can effectively use all the features of the LMS used in our university.	12.8%	64%	23.2%

Table 2: Items Related to Evaluation of LMS Features, Item Explanations, and Percentages of Participants' Answers to Items of the Questionnaire in Part 3

Part 3	Items related to evaluation of LMS features	Explanation of LMS feature	No Knowledge (0)	Disagree (-)	Agree (+)	Undecided (3)
1	I have a positive opinion about the features of COMMUNICATION AND INTERACTION TOOLS of the LMS used in our university	The COMMUNICATION AND INTERACTION TOOLS of an LMS include these features: forum applications, in-site messaging between users, synchronous chat, making announcements, video conferencing, uploading files in various formats such as mp3/mp4/ppt to the system, using the computer screen as a blackboard during the live lesson.	9.6%	17.6%	40 %	32.8%
2	I have a positive opinion about the features of PRODUCTIVITY TOOLS of the LMS used in our university	The PRODUCTIVITY TOOLS of an LMS include these features: archiving course content, adding date and time limitations to assignments/activities, viewing upcoming activities, downloading course content to a PC for offline work, extra information on how to use the system, and access to help resources and the help menu.	9.8%	13.9%	53.6%	22.7%
3.	I have a positive opinion about the features of COLLABORATION TOOLS of the LMS used in our university	The COLLABORATION TOOLS of an LMS include these features: -Instructors can create as many groups as they wish, students can see their groups, send messages to each other, and interact with chat rooms and forums. -Instructors can track students' progress by examining the products (for example, homework and projects) created by the students during the semester and uploaded to the system. -With the wiki module, participants can create and edit a web page, and prepare a content individually or by working together with the whole class.	13.6%	18.4%	36.8%	31.2%

4	I have a positive opinion about the features of MANAGEMENT TOOLS of the LMS used in our university.	<p>The MANAGEMENT TOOLS of an LMS include these features:</p> <ul style="list-style-type: none"> -Authentication takes place after the user enters his/her username and password once, and then the user is not required to enter the username and password again to access different applications in the system. -The system makes it possible to define student, instructor, administrator and guest roles according to their authorisation levels, the administrator can specify an unlimited number of user types, and students and teachers can be assigned to different roles in different courses. -Instructors can allow students to enrol students in the course or they can enrol students themselves. The administrator can enrol students in a course en masse. -The current course can be archived or used to transfer the content of the same course to another course. 	7.2%	20 %	48 %	24.8%
5	I have a positive opinion about the features of COURSE DELIVERY TOOLS of the LMS used in our university.	<p>The COURSE DELIVERY TOOLS of an LMS include these features:</p> <ul style="list-style-type: none"> -Creating a question bank, creating various question types, preparing feedback for questions. -Homework and exam grades can be viewed, awarded grades can be added to the grade book automatically, and grading can be made optionally according to a bell curve, letter grade or passing grade. -During exams, questions and options for questions may appear randomly by themselves, time and repetition limitations may be imposed on exams, and instructors can decide whether or not to display results/or whether to display the result after each question or at the end of the exam. -The instructor can add and edit various activities for a course such as homework, online classes (Moodle, Google Meet, etc.), resources and exams. -The instructor's information and explanations related to the introduction to the course, the resources to be used in the course, etc., can be published on the page of the relevant course. -The instructor can add resources such as videos, animations, presentations and e-books related to the topics. 	7.2%	17.6%	45.6%	29.6%
6	I have a positive opinion about the features of CONTENT DEVELOPMENT TOOLS of the LMS used in our university.	<p>The CONTENT DEVELOPMENT TOOLS of an LMS include these features:</p> <ul style="list-style-type: none"> -The instructor can transfer course materials from one course to another, and share content with other instructors in the system. -A designed course can be used as a template for courses in subsequent academic periods. -The instructor can change the menu structure and the names of the menus in his/her own course, and the student can change the places of the objects and optimise the interface for him/herself. -The instructor can support the course content with texts, visuals, animation, sound and video. 	11.2%	20%	40%	28.8%

7	I have a positive opinion about the HARDWARE COMPATIBILITY features of the LMS used in our university.	The HARDWARE COMPATIBILITY of an LMS includes these features: -The LMS can be accessed from different browsers such as Google Chrome, Mozilla Firefox or Microsoft Edge, and the LMS can operate on many database platforms. -The LMS can always be accessed / can operate uninterruptedly.	8.8%	20.8%	38.4%	32%
8	I have a positive opinion about the REPORTING TOOLS feature of the LMS used in our university.	The REPORTING TOOLS feature of an LMS is as follows: the length of time in which the student and instructor remain in the course content and the frequency with which they visit it, and the frequency, dates and duration of users' access to course content, forums and assignments can be seen.	12 %	10.4%	52.8%	24.8%
9	I have a positive opinion about the LANGUAGE SUPPORT feature of the LMS used in our university.	The LMS can be used in multiple languages (there is a language selection option)	24%	12.8%	46.4%	16.8%

4. Discussion

4.1. LMS-related Training and Effective Use of LMS

A number of students stated that they did not know all the features of the LMS or that they could not use all the features of the LMS effectively. These two findings may be related to LMS training, because some students stated that they did not receive any LMS-related training, while almost a quarter of the students who had received training stated that this training was not adequate or effective. According to these results, the lack of knowledge about the features of the LMS among the students who had not received training may have impacted their effective use of the LMS. Similarly, in the study conducted by Kirazlı-Korkmaz (2022, p.92) with 383 tourism students, only 40% of the students reported that they received training on the use of the system at the beginning of the distance education process, while 34.8% expressed the opinion that adequate training about the use of the LMS was not given.

Although only a small number of students stated that the LMS-related training was adequate and effective, the students' positive statements about their knowledge of all the features of the LMS and their ability to use these features effectively appear to be contradictory findings. A similar contradiction was also reported in a study conducted by Serçemeli & Kurnaz (2020) on students who took accounting courses via the distance education method. The authors stated in their study that although students did not fully adopt the LMS system, they did not experience any problems in terms of self-efficacy for using the LMS. This self-efficacy may be related to the possibility that the LMS used by the university had a user-friendly and understandable interface compared to its counterparts, or to the fact that students had the opportunity to easily access the online educational resources related to LMS systems from outside the university.

4.2. Features of the LMS

The most important component in distance education is interaction (Anderson & Simpson, 2012). Moore (1993) defined three types of interaction in distance education. These are 1) student-student interaction, which is

characterised as the mutual exchange of ideas and sharing of information and dialogue among students, 2) teacher-student interaction, which is carried out for dialogue between the student and teacher (in this study, the lecturer) and for giving and receiving feedback, and 3) student-content interaction, which is the process by which students can utilise course materials related to the subject they are to learn. Along with the greater inclusion of computer and internet applications in distance education due to developing technology, the “student-interface interaction” dimension defined by Hillman, Willis and Gunawardena (2009) emerged as a fourth type of interaction.

In distance education, communication between the computer and the user is also a type of interaction. Regarding this dimension, Bouhnik and Morcus (2006) added the student-system-instructor dimension, which is communication with the software by the student and instructor, as the fourth type of interaction. Many studies in the literature have revealed the importance of communication and interaction in distance education, and have shown that a lack of interaction negatively affects student achievement and motivation (Çakın, 2021).

Although it is emphasised that interaction is very important in distance education, it is a very thought-provoking finding that only 40% of the students in this study had a positive opinion about the features of **communication and interaction tools** of the LMS they used. These features of an LMS include functions such as forum applications, synchronous and/or asynchronous in-site messaging, chats, making announcements, and video conferencing between users. The features of **collaboration tools** of an LMS also include functions such as enabling instructors to create as many groups of students as they wish during the course, and allowing student groups to send messages to each other and to the instructor. In order to increase the amount and quality of interaction in distance education, not only should an LMS have these features, but also, both students and instructors should know how to use these functions. Otherwise, limited communication and interaction will negatively affect individuals’ socialisation (Hawkey, L.C. & Cacioppo, 2010)

The low number of students who thought positively about the communication and interaction features of the LMS they used, and the considerable number of students (18.4%) expressing negative opinions about the features of collaboration tools of the LMS that they used may be related to the inability of the LMS to meet students’ needs due to its limited features for providing communication, interaction and collaboration. Another reason may be due to students’ negative perceptions towards distance education. In her study, Mercan (2018) revealed that students had strong beliefs in terms of not believing that they could learn better in distance education. In this study, too, even though the LMS used by students had effective communication and interaction features, they might not have wished to spend time and effort on learning the features enabling interaction of the LMS they used or on how to use them because they thought that distance education would not be effective for their learning.

The features of **management tools** of an LMS include functions such as login and authentication processes; procedures related to defining the student, instructor, administrator and guest roles according to their authorisation levels; the processes of identifying different user types and assigning these users to different roles in different courses; procedures for instructors aimed at enrolling students in the course; and archiving the current course. Although almost half of the students stated that they thought positively about this feature of the LMS, a similar percentage (44.8%) of students had a negative opinion of this feature of the LMS or were undecided about whether they thought positively about this feature, which suggests the possibility that they might have experienced some problems while registering in the system or that they might have thought that the authorisations defined for the student role were limited.

The features of **productivity tools** of an LMS include functions such as adding date and time limitations to assignments/activities, viewing upcoming activities, downloading course content to a PC for offline work, extra information on how to use the system, and accessing help resources and the help menu. The features of **course delivery tools** of an LMS include processes related to preparing feedback for questions, viewing homework and exam grades, automatically adding grades to the grade system, determining the method of grading, and enabling the instructor to add resources such as homework, exams, videos and presentations to the course, while the features of **content development tools** include the processes related to allowing the instructor to share course content with other instructors in the system, using a designed course as a template in the lessons of subsequent education periods, changing the menu structure and the names of the menus in his/her own course, enabling the student to optimise the interface by making certain changes, and supporting the course content with texts, visuals, animation,

sound and video. These two features of an LMS are also related to all of Moore's theory of interaction: in distance education, the student accesses the knowledge and skills that he/she wishes to acquire in asynchronous and/or synchronous environments by using all the functions of the LMS that he/she uses: he/she asynchronously and/or synchronously reads/watches the course materials prepared by the instructor, downloads them to his/her computer to study them when offline as well, takes the relevant tests and exams, obtains feedback, participates in group and class discussions with friends, sees the homework assigned by the trainer and the announcements, asks questions to the trainer and answers the questions asked by the trainer, participates in in-class or group discussions on the subject, prepares homework projects in groups or pairs, and obtains support from the help menu when he/she has a problem with the software. All of these require the student to interact synchronously and/or asynchronously with his/her classmates, the course instructor, and course materials at different times. The LMS used by the student also forms the main platform for this interaction. Therefore, another interesting finding is that 53.6% of the students had positive opinions about the features of productivity tools of the LMS they used, which has a very important function for effective and permanent learning in distance education, 45.6% of students thought positively about the features of course delivery tools, and similarly, only 40% of students had positive views about the features of content development tools. The reason for this may be related to instructors' low level of knowledge and skills for using information technologies and the LMS. In the study by Chen et al. (2020), university students stated that university lecturers' ability to use information technologies was not sufficient. Similarly, in their research, Nenko, Kybalna and Snisarenko (2020) also revealed that academicians who could not keep up with the speed of technology development and could not improve themselves in this regard were reluctant to use information technologies.

The **hardware compatibility** of an LMS includes features such as being accessible from different browsers such as Google Chrome and Mozilla Firefox, operating on many database platforms, being continuously accessible and operating uninterruptedly. It was determined that one fifth (20.8%) of the students did not have a positive opinion about this feature. These students with negative views are likely to have experienced technical problems during the distance education process. Numerous studies in the literature revealed that the most important problems encountered by students during distance education were technical and infrastructure problems. Technical problems were mostly experienced during synchronous exams. Kirazlı-Korkmaz (2022) and Taşkesenligil (2021) stated that domestic learning systems developed by universities did not have the infrastructure to support online exams.

The **reporting** feature of an LMS includes functions such as the possibility to see how long the student and instructor remain in the course content, how often they visit it, and the frequency, dates and duration of users' access to course content and assignments. Students who did not know about this feature of the LMS they used, had a negative opinion of it, or were indecisive comprised almost half of the total number of participants (46.8 %). By providing educators with data on whether students are following the tutorials and showing interest in educational activities, this feature helps them decide whether the lesson is progressing in line with the objectives and whether any adjustments are needed. The reason why a considerable (35.2%) number of students were undecided or had a negative opinion of the reporting feature of the LMS they used may be that in some LMSs, the reporting feature was available only to instructors or included limited functions for students. The reason why more than half of the students were satisfied with this feature may be that they did not think that this limitation affected students' education.

The **language support** feature of an LMS is concerned with whether the LMS is available in multiple languages and whether it has a language selection option. Almost half of the students (46.4%) stated that they thought positively about the language support feature of the LMS that they used. However, almost a quarter of the students stated that they did not know about this feature of the LMS. Among the nine LMS features, this was the feature that students reported having the least knowledge of. This may be due to the fact that the language of instruction in most universities attended by the students participating in the study is Turkish and the language of the LMSs used by the universities is also Turkish, and therefore, the students did not feel the need to use the LMS in another language. On the other hand, a few students declared that they had a negative opinion about the language support feature of the LMS that they used. Similarly, a few students in Aşıcı's (2018) study stated that the limited Turkish language support made the LMS difficult to use. It is not known whether foreign students studying at a university in Turkey participated in this study, as there was no question about student nationality in the questionnaire used to collect the data in the study. However, considering the possibility that foreign students did participate, even if

these students knew enough Turkish to use the LMS, it is possible that they needed to use the LMS by choosing their own mother tongue or a foreign language that they knew better than Turkish in order to be able to use the LMS more effectively, and that they had difficulties in use due to the lack of this feature.

5. Conclusion

The use of communication technologies in educational environments reduces communication-based problems and increases students' motivation in distance education (Harasim, Hiltz, Teles & Turoff, 1996; Sudiby, 2022). LMSs provide a platform for organising distance learning in a way that enables the highest level of interaction. However, in order for this platform to increase the quality of education, not only should it have functional features that can meet the goals of users, but also, stakeholders need to know the features of the LMS in question and use these features effectively. Before choosing any LMS, the training service that will be provided and what kind of training will be provided to students should be determined, and depending on the data obtained by conducting research on user efficiency and satisfaction after use, it should be decided to either improve the LMS currently in use or to switch to using another LMS that has the features to meet the identified needs.

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Examination of the Relationship Between Primary School Students' Perceptions of Self-Learning and Decision-Making Skills

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Abstract

This study aims to reveal the relationship between primary school students' perceptions of self-learning and decision-making skills and whether gender, the education level of parents, and the number of siblings cause a difference. Within the framework of the stated purposes, the correlational survey model, which is among the quantitative research approaches, was used as a method in the research. The population consists of public primary schools' students studying in the city centre of Diyarbakır in the 2021-2022 academic year. The sample consists of 420 students determined by the "Simple Random Sampling" method, which is one of the probability sampling types, among the participants in the population. Descriptive and inferential statistical methods were employed to analyse the data. In the study, it was determined that there was a moderate, positive, and significant relationship between primary school students' self-learning and decision-making skills. In the study, it was determined that the self-learning skills of primary school students differed significantly according to gender and the number of siblings, but did not differ significantly according to the education level of their parents. In addition, the decision-making skills of primary school students were found to differ significantly according to gender and did not differ significantly according to the education level of their parents and the number of siblings.

Keywords: Decision Making, Primary School, Self-Learning, Skill, Student

1. Introduction

(Budak&Budak,2004) define decision-making as choosing among alternatives; (Baysal,2009) defines it as choosing among the available alternatives according to certain criteria; (Budak,2000) defines it as the ability, process, or method used to choose one of two or more alternatives by calculating the relevant probabilities; (Eren, 2009) defines it as the sum of different processes including the choices between ways, opportunities, and means; (Kuzgun,2006) defines it as the tendency to overcome the difficulties when there is more than one option to respond to the needs, and (Güçray, 2003) defines it as creating and choosing appropriate options after gathering and assessing the necessary information based on the defined goal and the selected options. It can be said that the common phrase in the definitions is to choose among various options.

In the decision-making process, the individual is supposed to comply with various criteria to make a decision. These criteria are listed as decisions that are effective, high quality, efficient, highly accepted, taken on time, and good and accepted according to one's judgments (Sağır, 2006). The decision-making skill inherent in the complex thinking skills can result in a happy or unhappy life as it is the act of choosing one of the options faced (Sarı, 2010).

Such a life may be experienced at work, in the family, and/or at school. In the context of this paper, the relevant experience is taken into consideration in a context specific to primary school students. Decisions taken or to be taken by students in various situations at school could tip the balance, in other words, such decisions could reveal whether a happy or unhappy school life will be experienced. It is suggested that the student's understanding of the importance of the decisions to be made in school life depends on his/her decision-making skill. This is because one of the main purposes of school education is to provide children with useful knowledge and skills in their daily lives (Çakmakçı et al., 2013). Considering this fact, decision-making skills in school life are crucial for students. Thus, the present study considered the level of decision-making skills of students as the research problem.

Self-learning skills are believed to be significant during school life or in the context of lifelong learning, together with the ability to make decisions. However, one may notice that self-learning skills are mostly used together with self-directed learning in the literature. Apart from this, concepts such as autonomous learning, individual learning, and autodidacticism are also used as synonyms (Gerstner, 1992). In this study, the concept of self-learning is preferred to overcome the conceptual confusion. Self-learning is a process in which learners take responsibility for learning, and the learner decides what, how, where, when, and how much to learn (Fisher et al, 2001; O'Shea, 2003; Tracy et al, 2005). There are four basic components in self-learning. These (Candy, 1991; cited in Canipe et al, 2006) are listed as individual autonomy, autodidactic approach, learner control, and learning management.

While developing self-learning skills, the family has a role at home and the teacher at school. Teachers' belief and acceptance of self-learning influence their preferred learning methods, teaching ethics, assumptions, and theories about learning, professional goals and values, and educational understanding of what and how they teach (Costa & Kallick, 2004; Mullin, 2011). The family, which makes a significant contribution to the success of school-age children, is interested in the physical, mental, and social development of the child (Yıldırım et al, 2008). Since the time a child spends at school is less than the time s/he spends with his/her family and society, what s/he learns at school should be consolidated within the family atmosphere (Tutkun et al, 2002). Such explanations reveal that self-learning is associated with multiple situations rather than a single situation.

This study was designed to shed light on the perceptions of self-learning and decision-making skills and to highlight whether students' self-learning and decision-making skills differ significantly according to various variables including gender, education level of parents, and the number of siblings. In line with the stated purposes, the following research problems were addressed:

1. What is the level of self-learning and decision-making skills of primary school students?
2. Do primary school students' perceptions of self-learning and decision-making skills differ significantly by gender?
3. Do primary school students' perceptions of self-learning and decision-making skills differ significantly according to their mother's education level?
4. Do primary school students' perceptions of self-learning and decision-making skills differ significantly according to their father's education level?
5. Do primary school students' perceptions of self-learning and decision-making skills differ significantly according to the number of siblings?
6. Is there a statistically significant relationship between primary school students' self-learning and decision-making skills? If yes, in what direction and level?

2. Research Model

In parallel with the purpose of the study, the correlational survey model was preferred. The reason why the relevant model was preferred is that it is aimed at revealing the relationships between two or more variables and reaching clues about cause and effect (Büyüköztürk et al., 2020).

2.1 Population and Sample

Fourth-grade students of public primary schools located in the city centre of Diyarbakır in the 2021-2022 academic year constitute the population. The sample consisting of 420 students was selected via the "Simple Random Sampling" method. In the simple random sampling method, all participants in the population have an equal chance to be included in the research (Büyüköztürk et al., 2020).

Of all the participants, 48.8% (n=205) are female while 51.2% (n=215) are male. 27.1% of participants' mother's education level (n=114) is primary school education, 35.2% (n=148) secondary school education, 21.7% (n=91) high school education, and 16% (n=67) university education. 13.1% of participants' father's education level (n=55) is primary school education, 32.6% (n=137) secondary school education, 24% (n=101) high school education, and 30.2% (n=127) university education. 18.1% of the participants have (n=76) one sibling, 21% (n=88) two siblings, 17.9% (n=75) three siblings, 28.3% (n=119) four siblings, and 14.8% (n=62) five and more siblings.

2.2 Data Collection Tools

A "Personal Information Form", "Self-learning Skills Scale", and "Decision-making Skills Scale" were used to collect data.

Personal Information Form: The study was designed to shed light on whether students' perceptions of self-learning and decision-making skills differ according to various demographic variables. There are items in the form that help determine teachers' gender, parental education level, and the number of siblings.

Self-learning Skills Scale: It was developed by (Burak, 2020) and consists of three factors, including cognitive, affective, and metacognitive skills, and 18 items. While the Cronbach Alpha reliability coefficient was calculated as ".81" in the original form of the scale, it was ".83" in this study. It is accepted that the calculated Cronbach's Alpha reliability coefficient values show that the data obtained from the decision-making skills scale is highly reliable ($.80 < \alpha < 1.00$) (Kalaycı, 2017).

Decision-making Skills Scale: It was developed by Sever and Ersoy (2019) and consists of a single factor and 15 items. While the Cronbach Alpha reliability coefficient was calculated as ".89" in the original form of the scale, it was ".85" in this study. It is accepted that the calculated Cronbach's Alpha reliability coefficient values show that the data of the decision-making skills scale is highly reliable ($.80 < \alpha < 1.00$) (Kalaycı, 2017).

2.3 Data Analysis

Before analysing the data, the data was checked in terms of normality and in this context, the kurtosis and skewness values of the data were evaluated (Gürbüz & Şahin, 2017). The kurtosis and skewness coefficients of the scales used in the study were found to be in the range of " ± 1.5 ". According to the kurtosis and skewness coefficient values (Table 1), the scores of the scales used in the study were shown to have a normal distribution (Tabachnick et al., 2013). In the analysis of the data, descriptive and inferential statistical methods were used according to the sub-problems of the research.

Table 1: Data on the level of self-learning and decision-making skills of primary school students

Dimensions	Skewness	Kurtosis
Cognitive Skills	-,101	-,518
Affective Skills	-,458	-,711

Metacognitive Skills	-,057	-,436
Self-learning Skills – General	-,076	-,387
Decision-making Skills – General	-,114	-,326

3. Findings

3.1 Findings on the Level of Self-learning and Decision-Making Skills of Primary School Students

Table 2 includes the findings on the sub-problem of “What is the level of self-learning and decision-making skills of primary school students?”.

Table 2: Data on the level of self-learning and decision-making skills of primary school students

Dimensions	\bar{X}	sd
Cognitive Skills	3,01	,600
Affective Skills	3,21	,649
Metacognitive Skills	2,97	,598
Self-learning Skills – General	3,05	,539
Decision-making Skills – General	2,92	,554

Table 2 highlights that the level of primary school students' self-learning skills is “mostly” for cognitive skills ($\bar{X}=3,01$), affective skills ($\bar{X}=3,21$), metacognitive skills ($\bar{X}=2,97$), and general ($\bar{X}=3,05$), respectively. One may also notice that primary school students' decision-making skills are at the level of “Generally ($\bar{X}=2,92$)”.

3.2 Findings of Self-learning and Decision-making Skills of Primary School Students by Gender

Findings on the sub-problem of “Do primary school students' perceptions of self-learning and decision-making skills differ significantly by gender?” are shown in Table 3.

Table 3: Analysis data on the level of self-learning and decision-making skills of primary school students by gender

Dimensions	Ender	n	\bar{X}	SD	$Sh_{\bar{x}}$	t_{Test}		
						t	Sd	p
Cognitive Skills	Female	205	3,17	,620	,043	5,437	418	,00
	Male	215	2,86	,541	,036			
Affective Skills	Female	205	3,37	,601	,042	5,001	418	,00
	Male	215	3,06	,658	,044			
Metacognitive Skills	Female	205	3,14	,621	,043	5,690	418	,00
	Male	215	2,82	,531	,036			
Self-learning Skills - General	Female	205	3,21	,550	,038	6,235	418	,00
	Male	215	2,90	,482	,032			
Decision-making Skills – General	Female	205	2,81	,583	,040	-4,130	418	,00
	Male	215	3,03	,503	,034			

The data in Table 3 reveal that students' decision-making skills differ significantly by gender ($t=-4.130$; $p<.05$). The significant difference caused by gender was in favour of male students since male students had significantly higher scores than female students ($\bar{X}_{male}=3,03 > \bar{X}_{female}=2,81$).

The data in Table 3 reveal that the self-learning skills of primary school students differ significantly by gender ($t=6.235$; $p<.05$). The significant difference between the self-learning skills of primary school students by gender was evaluated in favour of female students since female students' self-learning skills were significantly higher than male students ($\bar{X}_{\text{female}}=3,21 > \bar{X}_{\text{male}}=2,90$). According to the data in Table 3, the findings related to the significant difference determined in favour of female students in terms of the self-learning skills of primary school students by gender were also determined in the sub-dimensions of self-learning skills.

3.3 Findings on Self-learning and Decision-making Skills of Primary School Students by the Mother's Education Level Variable

Findings on the sub-problem of "Do primary school students' perceptions of self-learning and decision-making skills differ significantly according to mother's education level?" are shown in Table 4.

Table 4: Analysis data on the level of self-learning and decision-making skills of primary school students according to the mother's education level variable

Dimensions	Education Level	<i>f</i> \bar{X} and SD Values				ANOVA Data					
		n	\bar{X}	Sd	$Sh_{\bar{X}}$	Var. K.	<i>KT</i>	df	KO	F	p
Cognitive Skills	Primary	114	3,01	,607	,056	Between group	,430	4	,143		
	Secondary	148	3,05	,621	,051	Within group	150,832	415	,363		
	High School	91	2,96	,542	,056	Total	151,262	419		,395	,75
	Bachelor's Degree	67	3,00	,625	,076						
	Graduate	420	3,01	,600	,029						
	Total	114	3,27	,673	,063						
Affective Skills	Primary	148	3,22	,662	,054	Between group	1,009	4	,336		
	Secondary	91	3,18	,637	,066	Within group	175,534	415	,422		
	High School	67	3,12	,592	,072	Total	176,542	419		,797	,49
	Bachelor's Degree	420	3,21	,649	,031						
	Graduate	114	3,00	,631	,059						
	Total	148	3,02	,612	,050						
Metacognitive Skills	Primary	91	2,90	,545	,057	Between group	1,197	3	,399		
	Secondary	67	2,91	,577	,070	Within group	148,965	416	,358		
	High School	420	2,97	,598	,029	Total	150,161	419		1,114	,34
	Bachelor's Degree	114	3,08	,557	,052						
	Graduate	148	3,09	,560	,046						
	Total	91	3,00	,487	,051						
Self-learning Skills - General	Primary	67	3,00	,530	,064	Between group	,743	4	,248		
	Secondary	420	3,05	,539	,026	Within group	121,195	415	,291		
	High School	114	2,97	,635	,059	Total	121,938	419		,850	,46
	Bachelor's Degree	148	2,87	,531	,043						
	Graduate	91	2,90	,499	,052						
	Total	67	2,97	,526	,064						
Decision-making Skills	Primary	420	2,92	,554	,027	Between group	,855	4	,285		
	Secondary	114	3,01	,607	,056	Within group	127,822	415	,307		
	High School	148	3,05	,621	,051	Total	128,677	419		,927	,42
	Bachelor's Degree	91	2,96	,542	,056						
	Graduate	67	3,00	,625	,076						
	Total	420	3,01	,600	,029						

The data in Table 4 reveal that students' decision-making skills do not differ significantly according to the education level of their mothers ($F=.927$; $p>.05$). In addition, according to the data in Table 4, the findings related to the fact that students' self-learning skills do not differ significantly according to mother's education level are similar for the sub-dimensions of self-learning skills.

3.4 Findings on Self-learning and Decision-making Skills of Primary School Students by the Father's Education Level Variable

Findings on the sub-problem of "Do primary school students' perceptions of self-learning and decision-making skills differ significantly according to father's education level?" are shown in Table 5.

Table 5: Analysis data on the level of self-learning and decision-making skills of primary school students according to the father's education level variable

Dimensions	Education Level	f \bar{X} and sd Values				ANOVA Data					
		n	\bar{X}	Sd	$Sh_{\bar{X}}$	Var. K.	KT	df	KO	F	p
Cognitive Skills	Primary	55	3,00	,759	,102	Between group	1,991	4	,664	1,849	,13
	Secondary	137	3,04	,564	,048	Within group	149,272	415	,359		
	High School	101	2,90	,523	,052	Total	151,262	419			
	Bachelor's Degree	127	3,08	,613	,054						
	Graduate	420	3,01	,600	,029						
	Total	55	3,24	,753	,101						
Affective Skills	Primary	137	3,20	,666	,056	Between group	1,505	4	,502	1,192	,31
	Secondary	101	3,12	,624	,062	Within group	175,038	415	,421		
	High School	127	3,28	,596	,052	Total	176,542	419			
	Bachelor's Degree	420	3,21	,649	,031						
	Graduate	55	2,95	,768	,103						
	Total	137	3,03	,568	,048						
Metacognitive Skills	Primary	101	2,90	,536	,053	Between group	1,072	4	,357	,997	,39
	Secondary	127	2,99	,594	,052	Within group	149,090	415	,358		
	High School	420	2,97	,598	,029	Total	150,161	419			
	Bachelor's Degree	55	3,04	,692	,093						
	Graduate	137	3,08	,517	,044						
	Total	101	2,96	,483	,048						
Self-learning Skills - General	Primary	127	3,09	,526	,046	Between group	1,223	4	,408	1,405	,24
	Secondary	420	3,05	,539	,026	Within group	120,715	415	,290		
	High School	55	2,93	,659	,088	Total	121,938	419			
	Bachelor's Degree	137	2,83	,574	,049						
	Graduate	101	3,01	,488	,048						
	Total	127	2,94	,523	,046						
Decision-making Skills	Primary	420	2,92	,554	,027	Between group	1,914	4	,638	2,094	,10
	Secondary	55	3,00	,759	,102	Within group	126,763	415	,305		
	High School	137	3,04	,564	,048	Total	128,677	419			
	Bachelor's Degree	101	2,90	,523	,052						
	Graduate	127	3,08	,613	,054						
	Total	420	3,01	,600	,029						

The data in Table 5 reveal that students' decision-making skills do not differ significantly according to father's education level ($F=2.094$; $p>.05$). In addition, according to the data in Table 5, the findings related to the fact that students' self-learning skills do not differ significantly according to father's education level are similar for the sub-dimensions of self-learning skills.

3.5 Findings on Self-learning and Decision-making Skills of Primary School Students According to the Number of Siblings Variable

Findings on the sub-problem of "Do primary school students' perceptions of self-learning and decision-making skills differ significantly according to the number of siblings?" are shown in Table 6.

Table 6: Analysis data on the level of self-learning and decision-making skills of primary school students according to the number of siblings

Dimensions	Number of Siblings	f \bar{X} and SD Values				ANOVA Data					
		n	\bar{X}	Sd	$Sh_{\bar{X}}$	Var. K.	KT	df	KO	F	p
Cognitive Skills	1	76	2,83	,613	,070	Between group	5,865	4	1,466	4,185	,00 1-4 1-5 2-3 3-4
	2	88	3,08	,571	,060	Within group	145,397	415	,350		
	3	75	2,88	,585	,067	Total	151,262	419			
	4	119	3,12	,569	,052						
	5 and more	62	3,07	,642	,081						
	Total	420	3,01	,600	,029						
Affective Skills	1	76	3,02	,593	,068	Between group	4,667	4	1,167	2,817	,00 1-2 1-4 1-5
	2	88	3,22	,653	,069	Within group	171,875	415	,414		
	3	75	3,17	,694	,080	Total	176,542	419			
	4	119	3,31	,618	,056						
	5 and more	62	3,30	,670	,085						
	Total	420	3,21	,649	,031						
Metacognitive Skills	1	76	2,84	,573	,065	Between group	4,331	4	1,083	13,082	,01 1-2 1-4 1-5 2-3 3-4 3-5
	2	88	3,04	,614	,065	Within group	145,830	415	,351		
	3	75	2,84	,591	,068	Total	150,161	419			
	4	119	3,03	,581	,053						
	5 and more	62	3,10	,608	,077						
	Total	420	2,97	,598	,029						
Self-learning Skills - General	1	76	2,89	,532	,061	Between group	4,493	4	1,123	3,969	,00 1-2 1-4 1-5 3-4 3-5
	2	88	3,10	,544	,058	Within group	117,445	415	,283		
	3	75	2,94	,517	,059	Total	121,938	419			
	4	119	3,13	,501	,046						
	5 and more	62	3,15	,584	,074						
	Total	420	3,05	,539	,026						
Decision-making Skills	1	76	2,94	,539	,061	Between group	1,560	4	,390	1,273	,28
	2	88	2,98	,545	,058	Within group	127,117	415	,306		
	3	75	2,79	,567	,065	Total	128,677	419			
	4	119	2,94	,556	,051						
	5 and more	62	2,93	,558	,070						
	Total	420	2,92	,554	,027						

Table 6 reveals that students' decision-making skills do not differ significantly according to the number of siblings ($F=1,273$; $p>.05$). Yet, their self-learning skills differ significantly according to the number of siblings ($F=3.969$; $p<.05$). The significant difference determined according to the LSD test data is between students with one sibling and students with two, four, and five siblings as well as between students with three siblings and students with four and five siblings.

According to the data in Table 6, the findings regarding the significant difference between students' self-learning skills according to the number of siblings were similar for the sub-dimensions of independent learning skills. A significant difference occurred

- Between students with one sibling and students with two, four, and five siblings as well as between students with three siblings and students with two or four siblings in the cognitive skills sub-dimension,
- Between students with one sibling and students with two, four, and five siblings in the affective skills sub-dimension.
- Between students with one sibling and students with two, four, and five siblings as well as between students with three siblings and students with two, four, or five siblings.

3.6 Findings on the Relationship between Self-learning and Decision-making Skills of Primary School Students

Findings on the sub-problem of “Is there a statistically significant relationship between primary school students' self-learning and decision-making skills? If yes, in what direction and level?” are shown in Table 7.

Table 7: Analysis data on the relationship between self-learning and decision-making skills of primary school students

		Decision-making Skills
Cognitive Skills	r	,291**
	p	,000
Affective Skills	r	,329**
	p	,000
Metacognitive Skills	r	,366**
	p	,000
Self-learning Skills – General	r	,381**
	p	,000

**p<0,01

In the study, a moderate, significant, and positive correlation ($r=.38$; $p=.00$) was found between students' self-learning and decision-making skills. Considering the findings on the correlation based on dimensions, it was observed that decision-making skills and self-learning skills had

- A low and positive correlation with “Cognitive Skills” ($r=.29$; $p=.00$),
- A moderate and positive correlation with “Cognitive Skills” ($r=.32$ $p=.00$),
- A moderate, positive, and significant correlation with “Metacognitive Skills” ($r=.36$ $p=.00$).

4. Results

This study was designed to reveal the relationship between primary school students' perceptions of independent learning and decision-making skills. It is original as it is the only study in the literature considering its reporting period. However, originality, which is valuable in terms of the importance of the research, also creates a limitation in concluding the research with a strong discussion.

Research findings revealed that the self-learning skills of primary school students were at the level of “mostly”. Thus, it can be implied that students possess good skills and a sufficient amount of skills to act independently.

Another finding was that the self-learning skills of students differed significantly by gender. The relevant significant difference was in favour of female students who had significantly higher scores than male students. These results imply that students' skills are not similar to each other according to the gender variable. The gender variable was shown to be influential.

It was also concluded that the self-learning skills of primary school students did not differ significantly by mother's education level. This result reveals that students' skills are similar to each other according to the mother's education level variable. In addition, the mother's education level variable was shown to be not influential on the self-learning skills of primary school students.

It was also concluded that the self-learning skills of primary school students did not differ significantly according to the father's education level, indicating that the self-learning skills of primary school students are similar to each other according to the father's education level variable. In addition, it was found that the father's education level variable was not influential on the primary school students' self-learning skills.

Yet another finding was that students' skills in self-learning differed significantly according to the number of siblings. The difference determined at a significant level occurred between students with one sibling and students with two, four, and five siblings as well as between students with three siblings and students with four and five siblings. These results reveal that students' skills are not similar to each other according to the number of siblings, and that the number of siblings was effective on the self-learning skills of primary school students.

In the study, the significant difference between primary school students' self-learning skills according to the number of siblings occurred between students with two, four, and five siblings in terms of the cognitive skills sub-dimension as well as between students with three siblings and students with two and four siblings. On the other hand, the difference occurred between students with one sibling and students with two, four, and five siblings in terms of the affective skills sub-dimension. Finally, in the metacognitive skills sub-dimension, the difference occurred between students with one sibling and students with two, four, and five siblings as well as between students with three siblings and students with two, four, and five siblings. The evaluation of sub-dimensions also revealed that the number of siblings was influential on self-learning skills. And the self-learning skills of the students with 5 or more siblings were higher than the students with fewer siblings. This result reveals that the high number of siblings causes an increase in students' self-learning skills.

In the study, it was determined that the decision-making skills of primary school students were at the level of "generally", showing that the decision-making skills of the primary school students participating in the research are in good condition and that primary school students have a sufficient amount of skills in decision-making as well as acting independently in situations that require decision-making.

5. Discussion

Saeednia (2010) reported that 4th-grade primary school students like to learn independently and are willing to do research, but they do not consider themselves sufficient to realize independent learning. This result does not show parallelism with the results of the present study. Different results on self-learning skills may stem from the difference in sample groups and may also be associated with the learning environment created by the teachers in the classroom. For, research done by students in the context of self-learning skills not only increases their curiosity but also enables them to learn by themselves (Arnoldson, 2013).

Akpınar and Aydın (2007) had interviews with classroom teachers to conclude that teachers are aware of the new roles emphasizing the changes in education and accept these roles, but that they find themselves inadequate in practice and need to be trained. It can be suggested that this inadequacy prevents achieving the desired level of success in the learning environment. This reveals that if a student's self-learning skills are expected to be at an advanced level, teachers are the ones who should provide this in the learning environment.

The period between the ages of 6-12 is an important period for the child to gain cognitive skills. At this stage, the child develops a system of conscience, ethics, and values as well as begins to express thoughts about what is happening around him/her and even forms primary preferences (Bacanlı, 2006). In this context, it is even more significant for the 4th-grade students to acquire decision-making skills in primary school (Demirbaş 2018).

It was concluded that students' decision-making skills differed significantly by gender. This significant difference was in favour of male students since they had significantly higher scores than female students. This implies that

their decision-making skills are not similar to each other according to the gender variable. In addition, the gender variable was observed to be influential. Along the same lines, (Uçar, 2019) reported that gender had an effect on students' behaviors while making decisions.

The researcher also discovered that students' skills in making decisions did not differ significantly according to the education level of their parents. This implies that their decision-making skills are similar to each other according to the parental education level variable and that the relevant variable was not influential. In parallel with this result, (Uçar,2019) reported that students' behaviors in making decisions are associated with the education level of their parents.

One may also notice that the number of siblings was also a source for significant difference in students' decision-making skills. This shows that their decision-making skills are similar to each other according to the number of siblings and that the number of siblings is not influential in this sense. Along the same lines, (Uçar 2019) reported that gender had an effect on decision-making behaviors.

In the study, the relationship between the self-learning and decision-making skills of primary school students was found to be moderate, positive, and significant. There was a low and significant relationship between decision-making skills and cognitive skills and a moderate and positive relationship between decision-making skills and affective skills and metacognitive skills. This reveals that as the decision-making skills (Kıranlı et al, 2007) which refer to a design process, increase, the self-learning skills of primary school students increase in a positive way in parallel. In other words, the result reveals that as primary school students' self-learning skills increase, their decision-making skills increase in parallel.

It is believed that the self-learning skills scale developed by (Burak ,2020) and the decision-making skills scales developed by (Sever et al., 2019) are important in terms of the criterion validity of the scales to be used in a different study after the development processes. The use of the scales expressed in the literature by including various sample groups in the research processes may allow the comparison of different research results. In addition, it will make it possible to learn how the differentiation of sample groups causes a difference in the self-learning and decision-making skills of primary school 4th-grade students through future studies.

Not only 4th-grade primary school students' level of self-learning skills and decision-making skills was determined but also there was an investigation into whether there was a significant difference according to some variables. Considering the variables with or without significant differences, results could be examined in depth by conducting research with qualitative approaches.

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Examining the Effect of Using Mobile Technologies in Chemistry Laboratory on Self-Directed Learning Readiness: An Action Research

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Abstract

The aim of the present research is to determine the current situation in the readiness levels of 11th grade high school students for self-directed learning, to examine the effectiveness of laboratory activities developed with mobile technology integrated into the 5E learning model in various chemistry subjects on students' self-directed learning levels, and to contribute to improving the quality of teaching by taking student opinions about the activities developed at the end of the study. The research was designed as action research from qualitative research designs. The related laboratory activities developed within the scope of the research were carried out with thirty-three 11th grade students. The Self-Directed Learning Readiness Scale (SDLRS) was used to determine the readiness levels of high school students for self-directed learning and a semi-structured interview form was used to determine the students' views on the activities. The data obtained from the interviews were analyzed by content analysis. During the applications, students performed the activities with mobile technology in a much shorter time compared to the classical laboratory activities and they had the opportunity for self-directed learning thanks to the mobile technology support they used in the applications. In the study, it was observed that students improved their ability to display the data obtained from the necessary calculations in various chemistry subjects, especially at the end of the activities, in the form of graphs without the help of a teacher.

Keywords: Chemistry Laboratory, High School Chemistry Teaching, Mobile Technology, Readiness for Self-Directed Learning

1. Introduction

1.1 Introduce the Problem

Today, technology plays the most important role in making life easier and more efficient (Siwawetkul & Koraneekij, 2020). The availability of smartphones at affordable prices has led to an increase in the use of applications for various aspects of life such as communication, travel, entertainment, productivity and learning (Kearney, Burden & Rai, 2015). Technology is widely used in every aspect of our daily lives as well as in teaching and learning environments. The mobile devices used in mobile learning in our modern life are summarized as follows (Göksu & Atıcı, 2013): Laptop, tablet PC, personal digital assistant, smartphone. Four different communication or connection technologies are used to enable mobile devices to communicate online or with other

mobile devices: GPRS, Wireless (Wi-Fi), Bluetooth and Infrared. These communication technologies are available on some mobile devices. With the advent of mobile technologies, students learn how to better learn scientific knowledge through these mobile devices, and in the process, students become inquisitive and inquisitive individuals. Mobile learning provides new possibilities for the learner, such as learning that is personalized, contextualized and unhindered by temporal or environmental constraints and self-directed / independent (Crompton, 2013).

The definitions made in terms of the amount of responsibility that learners accept for their own learning are used in the literature for self-directed learning. The self-directed learner takes control of his/her own learning and is free to learn the information that he/she thinks is important to him/her (Fisher, King & Tague, 2001). The willingness of the learner to undertake his/her own learning varies depending on attitude, ability and personality traits. Knowles (1975, 1990) mentions two continuous situations in educational environments: Teacher-directed (pedagogical) learning and self-directed (andragogic) learning. According to Knowles (1990), the pedagogical learner is completely dependent on the teacher in identifying learning needs, formulating goals, planning and implementing learning activities, and assessing learning. Andragogic learners, on the other hand, prefer to take responsibility for meeting their own learning needs (Fisher, King & Tague, 2001). Therefore, the self-directed learning continuum can be defined as follows: The amount of control the learner has over his/her own learning, the amount of freedom given to learners to assess learning needs and apply strategies to achieve learning goals (Fisher, King & Tague, 2001).

Undoubtedly, constructivist learning approach is one of the educational environments in science education that enables students to increase their responsibility for their own learning, to have more control over the teaching of targeted concepts, facts and events, and to be active and active in accessing information inductively. At each stage of the learning models in this learning approach, students are active and take more responsibility for their self-learning in accessing information (Güngör Seyhan & Morgil, 2007). In this study, the 5E learning model based on the constructivist learning approach was used. The activities developed to be applied at various stages of the related learning model were supported by sensors integrated with mobile technology. Experimental sets consisting of sensors integrated with mobile technology consist of a PC tablet and a wide variety of sensor kits. The experiment set can be used for teaching-learning purposes in both in-class and out-of-class environments. In case some of the variables targeted to be investigated change during the experimental process, the relevant experimental set can provide opportunities to record data instantaneously in a synchronized manner and display them in the form of tables/graphs. Therefore, it is seen that laboratory applications at the high school level in the Turkish education system are not carried out very often, and the related activities are carried out with closed-ended (confirmatory) laboratory approaches and therefore are examples of pedagogical learning as stated by Knowles (1990) (Güngör Seyhan & Okur, 2020). In the light of this information, this study aims to develop laboratory activities through sensors integrated with mobile technology integrated into various stages of the 5E learning model in teaching various chemistry topics. In this way, it is thought that laboratory activities carried out through sensors integrated with mobile technology will provide an andragogic learning environment for high school students. The opinions of the volunteer students selected for the effectiveness of the related activities on the students' readiness levels for self-directed learning were also consulted at the end of the study.

1.2 Research Objectives

For improving education at all levels in schools and in the field of learning, improving teacher quality and productivity, competencies need to be developed and the teaching environment needs to be reorganized and strengthened in accordance with the student-centered approach. Based on all this information, the aim of this study is to examine the effect of laboratory applications carried out through sensors integrated with mobile technology integrated into the 5E learning model for high school 11th grade students on students' self-directed learning readiness levels. At the end of the study, student opinions about the activities were also investigated.

2. Conceptual Framework

2.1 Self-Directed Learning

Nowadays, thanks to the developing technology, accessing information and following new developments has become easier and easier, and the need for learning and therefore questioning new information has also increased. In this process of rapid change, the environments in which students receive ready-made information and passively participate in learning-teaching environments have been replaced by an education system in which students actively participate in the learning process, are more critical and inquisitive, and are more responsible for their own learning. The main purpose of the science course is to raise individuals who can use 21st century skills such as questioning, research, analytical and critical thinking skills, and being a good problem solver. Bloom states that there are different components of learning and that these components should take place in learning processes in certain steps. These components include curiosity, need, motivation, questioning, doubt, research, experimentation, adaptation and reinforcement. It is emphasized that learning can be complete and useful when these components are present. All these developments bring along the importance of the concepts of readiness for self-directed learning in the literature.

The earliest sources of self-directed learning date back to Greek philosophers. According to Socrates, it was defined as the self-directed learning of individuals by taking advantage of the opportunities in the environment, while Plato emphasized that the most important goal in students' learning was to give them the ability to learn by self-direction. While Aristotle emphasized the importance of self-awareness, Kulich (1970) gave many examples of self-directed learning in history. Newsom (1977), on the other hand, worked on the importance of "Lifelong Self-Directed Learning" in 1558-1640 and argued that andragogic learning in classes, schools and libraries has many benefits. This learning has been defined as "the degree to which an individual possesses the attitudes, abilities and personality traits necessary for self-directed learning" (Wiley 1983, p.182). If the content of this definition is examined, there are several assumptions about readiness for self-directed learning: Adults are naturally self-directed, so readiness for self-directed learning exists along a continuum and is present to some degree in individuals. Second, the competencies necessary for self-direction can be developed to some extent and the best way to learn autonomous behavior is to act autonomously. Finally, the ability to learn independently in one situation or context can be generalized to other settings (Candy 1991; Fisher et al., 2001; Guglielmino 1989).

2.2 Self-Directed Learning and Technology

With the rapid development and change in the technology sector in recent years, laptop computers, smart phones and tablets have replaced the desktop personal computer, which has been used as the only technology product in the classroom until now, as they are more ergonomic and offer access at less cost. The integration of more widespread internet access into these technologies and their use in educational environments provide teachers with more flexibility for their role as a guide. As the place of technology in the learning-teaching environment becomes more important, researchers have started to give more importance to studies on this subject (Meyer, Rose & Gordon 2014). However, it is also among the opinions stated that access to technology alone will not be sufficient for students' self-directed learning (Rose & Meyer, 2002). For this reason, all knowledge, skills and tendencies that may be necessary for students and/or teachers to develop self-directed learning should be investigated first (Shotlekov & Charkova, 2014). Afterwards, it is necessary to investigate the knowledge, skills and tendencies required for technology literacy and technology integration of students and teachers (Reinders & White, 2016; Jiménez, Lamb & Vieira, 2017). How students' technology literacy should be measured and evaluated is one of the issues that should be investigated. Based on all this, it has become a common goal for educators to incorporate technology into learning-teacher environments to support more self-directed and autonomous learning in the classroom. However, it is reported that teachers have difficulties in integrating more self-directed learning approaches, methods and/or techniques into their educational environments. Self-directed learning differences in students and/or various competency differences in students, language backgrounds and/or socioeconomic backgrounds are shown as the reason for this situation (Francis, 2017).

2.3 Mobile Technology in Turkish Science Education

The use of information technologies such as computers in science teaching is one of the most promising developments in recent years. However, very little research is known about the use of such information technologies within the framework of applied learning-teaching environments such as laboratories. Using computers integrated into laboratory work is one of the special opportunities that this technology provides.

Computers can serve as tools for measurement, graphing, simulation and modelling, to list just a few of the rich possibilities. Many related studies have claimed that one of the main problems posed by the "classical" laboratory work in science education is that students can perform experiments without being able to successfully follow the steps described in the laboratory worksheet and without understanding the physical model that validates their activity (Lunetta 1998; Pernot, 1993). The new technologies can complement and further support student collaboration and participation in school laboratory experiences (Lunetta 1998) emphasize that computer-aided modeling can be more effective in enabling students to be more active during laboratory work (Schecker 1990; Niedderer, Schecker & Bethge 1991) and in strengthening the link between theory and practice (Sander, Hücke & Fischer, 2002).

An education project has been developed in Turkey in order to use technology effectively in the classroom, to eliminate the inequality of opportunity between schools in terms of technological equipment and to enable teachers to integrate technology into their classrooms more easily. The FATİH Project, carried out in cooperation with the Ministry of National Education and the Ministry of Transport, aims to provide technological equipment to schools, professional development programs for teachers on the use of this equipment and training of users. In addition, this project has many specific objectives such as developing lifelong learning, enabling individuals to improve themselves through e-learning, ensuring that every student graduating from high school has the skills and basic knowledge to use information technologies, ensuring that one out of every three people benefit from e-education services through the effective use of the Internet, providing individual opportunities for the use and learning of information and communication technologies, and making the Internet a safe environment for the whole society. In this context, the Ministry of National Education has demonstrated that it is not remaining silent about technological applications by purchasing experiment sets with sensors (NOVA 5000-Tablet PC) integrated with mobile technological devices in parallel with the developments in technology to the science laboratories in the schools within the scope of this project, which was put into practice in 2009.

2. Method

2.1. Research Design

This research was designed as action research, one of the qualitative research methods. Action research involves the researchers' handling of the implementation process in order to understand and solve the problems that arise in practice (Yıldırım & Şimşek, 2013, p.74). Action research begins with reflections on the practices by the researcher. The plan created to solve the problem must be compatible with the research methods and appropriate tools should be used in this process. Even if the plan is well designed, it can be revised throughout the process. When the relevant action is completed, reflection is made on this action and the action is evaluated (Collins & Spiegel, 1995).

2.1 Study Group

The study group of the presents research consists of 33 high school 11th grade students studying in a branch of one of the qualified public high schools in the center of Sivas province. The sample of study group was determined according to the purposeful sampling method, which is one of the non-probability sampling methods. In this sampling method, the researcher determines the units to be included in the sample with the researcher's own judgment in accordance with the purpose of the researcher based on previous knowledge, experience and observations (Ural, 2011:45). In this study, sensors integrated with mobile technology were used in the applications in the guidance materials developed by the researchers. Therefore, students in schools that have mobile technological devices used within the scope of the study were included in the study. Students carried out the applications in the developed guidance materials in groups of 4-5 students. The implementation process was carried out as group work. Simple random sampling method was used to form student groups (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz & Demirel, 2008: 89).

2.2 Data Collection Tools

In order to determine the self-directed learning readiness of high school students, the “Self-Directed Learning Readiness Scale (SDLRS)” developed by Fisher, King and Tague (2001) was used as a data collection tool in this study. In the original version of the scale, Fischer et al. (2001) created an item pool of 93 items after reviewing the literature, and then these items were presented to expert opinion using 2 rounds of Delphi technique, and a 52-item draft form was created. After the draft form, it was applied to 201 students studying in the Nursing Undergraduate Program. A 40-item 3-dimensional (self-management, desire for learning and self-control) scale was obtained from the application, whose Kaiser-Meyer-Olkin (KMO) value was calculated as 0.88. The total internal consistency reliability coefficient of the scale was 0.92; the internal consistency reliability coefficients of the three subscales were calculated as 0.86, 0.85 and 0.83 respectively. The adaptation of the scale to Turkish for use with prospective teachers was carried out by Şahin & Erden (2009) and Salas (2010). The scale was used by Ulusoy & Karakuş (2018) for the study conducted for high school students. In the study by Salas (2010), first of all, linguistic equivalence of the scale items was made and factor analyzes were performed by applying the form to pre-service teachers in order to determine the construct validity of the Turkish form. As a result of the factor analysis, the KMO value of which was calculated as 0.90, 7 out of 40 items in the original scale were removed from the scale. Consisting of 33 items and 3 dimensions (self-management, desire for learning, and self-control), the scale explains 41.02% of the variance and item loads vary between 0.35 and 0.76. In comparisons between 27% upper and 27% lower group averages, t values were found to be significant at the level of 0.00 ($p=0.00<0.05$). While scoring the items in the scale, the individual who marks the "Strongly Agree" section is given 5 points, and the individual who ticks the "Strongly Disagree" section is given 1 point. Since items 25 and 33 contain negative statements, they are scored in reverse while scoring. Other than these items, 31 items are scored normally. The lowest score that can be obtained from the scale is 33, and the highest score is 165. It is accepted that the higher the score obtained from the scale, the higher the individual's SDLR level (Salas, 2010).

Cronbach's Alpha coefficient was used to determine the internal consistency of the scale. The Cronbach's Alpha value, which is the internal consistency coefficient of the scale, was 0.91; The internal consistency coefficients of the three factors were calculated as 0.89, 0.82 and 0.77, respectively. In addition, the total item correlations were checked for reliability. The correlation between the main scale and subscales was significant at $p<0.01$ ($p=0.00<0.01$). In the light of these data, it is seen that the scale is a valid and reliable valid measurement tool that can be used to measure pre-service teachers' self-learning readiness. A pilot study was conducted with 178 high school students before using SDRLS in this study, which was adapted into Turkish for use with pre-service teachers. After the validity and reliability analysis, the Cronbach's alpha reliability coefficients of the scale were calculated as 0.84 for the total scale and 0.81, 0.80 and 0.82 for the sub-dimensions, respectively.

Another data collection tool used in the study was semi-structured interview forms consisting of 4 open-ended questions. This form included students' opinions about the laboratory applications carried out with mobile technology, which were thought to have an impact on students' readiness for self-directed learning. Expert opinion was utilized to ensure the content and face validity of the semi-structured interview questions. The interviews were conducted with a total of 6 volunteer students who participated in the activities. It is very important to ensure ethical rules in research, therefore, the students were coded as VS1, VS2, ..., VS6 in order to keep their identities confidential. The interview with each student lasted approximately 15-20 minutes.

2.3 Mobile Technology-Supported Laboratory Activity

The study started with a literature review on laboratory applications with sensors integrated with mobile technology. As a result of the reviews, it was determined that applications supported by mobile technological devices are not used in science laboratory environments in the Turkish education system (Güngör Seyhan & Okur, 2020). Experimental sets consisting of sensors integrated with mobile technology were used in the study. The related experiment sets are Windows CE-based NOVA5000 experiment systems distributed to schools by MoNE in 2009 for use in primary and secondary education levels. NOVA5000 experiment systems are portable systems that can work with Windows operating system and allow data to be transferred to other devices using technology. In this context, it was decided to prepare laboratory activities realized with the help of sensors integrated with mobile technology in teaching various chemistry subjects at high school level. After the pilot studies of the developed activities, the necessary arrangements were made by the researchers and the actual applications were started.

2.4 Application Process

In this study, it was determined that high school students' readiness for self-directed learning was at a low level with the pre-test of the SDLRS applied before the interventions. The reason for this result may be that there are limited laboratory applications for the subjects that are theorized in the classroom in science courses, the use of classical experimental tools and the experiments are carried out with closed-ended laboratory approaches in cookbook format. Therefore, the researcher(s) aimed to solve this problem with a study based on the technical skills laboratory approach. In the study, it is thought that the contents of laboratory applications supporting the theoretical teaching of various chemistry topics given in high school chemistry course should be revised and with this revision process, students' readiness for self-directed learning can be improved. For this purpose, four guidance materials were designed for various chemistry topics (Gas Laws, Colligative Properties, Solubility, Chemical Equilibrium: Let's Find the Equilibrium Constant) within the framework of the 5E learning model, including laboratory activities supported by sensors integrated with mobile technology. The related materials consist of student worksheets in which the introduction, exploration and evaluation steps of the 5E learning model are discussed and a teacher guide material in which all steps of the learning model are explained. The study was conducted in a total of 10 weeks during the academic year in which the related chemistry topics were included.

3. Results

3.1 Findings from the self-directed learning readiness scale

SDLRS was applied as pre and post-test in order to determine the students' readiness levels for self-directed learning before the applications and the change in these levels after the 10-week applications. The results obtained from the dependent variable t-test analysis to determine whether there is a significant difference between the pre and post test scores of the related scale are given in Table 1.

Table 1: Dependent variable t-test results regarding SDLRS pre- and post-test scale scores

SDLRS	N	X	SD	df	t	p
Pre-test	33	83.5758	5.08693	32	- 17.094	0.000
Post-test	33	106.4848	7.32343			

According to the analyses, there was a significant increase in students' readiness for self-directed learning as a result of sensor-supported laboratory applications integrated with mobile technology ($t(33) = -17.094$, $p < 0.005$). Before the applications, the mean of the pre-test results of the students' SDLRS was $X_{pre} = 83.58$, while this value was $X_{post} = 106.48$ after the applications. This finding shows that sensor support integrated with mobile technology in laboratory applications is effective in increasing students' readiness for self-directed learning.

3.2 Results from the semi-structured interview form

Sensor-supported laboratory applications integrated with mobile technology for various chemistry subjects were carried out in the study. In this context, student and teacher guidance materials were developed for various chemistry subjects. At the end of each related activity and then at the end of all the applications, 6 volunteer students were interviewed about the effectiveness of the applications.

In the first question of the semi-structured interview questions, pre-service teachers were asked "Considering the experimental process steps of the laboratory applications with sensors integrated with mobile technology (separately for each of the related activities), what do you think about the advantages and disadvantages? Explain" question was asked. The answers given by the students to this question of the interview were transcribed and codes were created. As a result of the answers given, the codes extracted as the advantages and disadvantages of the applications and the sample answers given by the students are presented in Table 2

Table 2: The students' responses and frequencies to the first question of the interviews as "Advantages (A) and Disadvantages (D)"

Code No	Code	Participants	f	Excerpts from student responses
A1	Effective and economical time management	VS1, VS2, VS3, VS4, VS5, VS6	6	<p>"...By performing our experiments much faster, we had the opportunity to do the experiment over and over again and to notice the variables in the experimental setup..." (VS6).</p> <p>When we did the "chemical equilibrium" experiment with classical tools, we were reaching the equilibrium constant from the height calculation by looking at the color intensity of 4-5 solutions that we created by diluting from the standard solution. Sometimes this high value could be very different from the values found by other groupmates and this took a lot of time. But with these experiment sets, we finished this experiment on our own in a very short time" (VS3).</p> <p>"...We can reach the results of the experiment in a very short time. We were able to spend more time on graphing these results and interpreting the graphs when we wanted to..." (VS1).</p>
A2	Faster access to more reliable data sources	VS2, VS3, VS4, VS6	4	<p>"...These sensor kits allowed us to reach the results of the experiment in a shorter time. In this way, we had the opportunity to discuss more with our groupmates about the results of the experiment. Since we easily understood how to use these sensor kits in the process steps of the sample experiments, we needed our teacher in very few stages in real activities." (VS2).</p>
A3	Providing synchronized visual data	VS1, VS4, VS5, VS6	4	<p>"..... For example, in the experiment "Finding the chemical equilibrium constant", we were able to see the data we received with the help of the colorimeter sensor for the color intensity values corresponding to each solution concentration on the PC tablet in both table and graph form" (VS6).</p> <p>"In the experiment about the equilibrium constant, our teacher asked us to draw the results in the form of a graph using the values obtained at the end of the experiment. Many of my groupmates had difficulty in drawing. With the instant display of the graphs on the PC tablet, we had the opportunity to compare ourselves." (VS3)</p>
A4	Preservation of written and visual data in digital environment	VS1, VS2, VS3, VS4, VS5, VS6	6	<p>"...Maybe this is the best part of these applications. In the previous semester, we had a notebook in which we recorded all the data in the laboratory. In these applications, we were able to record all the data of each activity on the PC tablet, we did not have to worry about losing the data." (VS2).</p>
A5	Being portable (mobile) of experimental tools and equipment	VS1, VS2, VS3, VS4, VS5, VS6	6	<p>"One of our activities was about colligative properties. In the freezing point depression experiment, we had the opportunity to take the temperature sensor and watch the change in the freezing point of water in the school garden." (VS1)</p>
D1	Requires experience in installation and use	VS1, VS4, VS5, VS6	4	<p>In the experiment "...Finding the equilibrium constant" we used the colorimeter sensor and it was the first time we had seen it. Although our teacher had explained the colorimeter analysis beforehand, it was a bit tiring to put the solutions into the relevant tubes and place them on the sensor and access the</p>

					<i>desired information on the PC tablet and understand what it meant, so we relied more on our teacher's help" (VS4).</i>
D2	Blunting the ability to record and visually present data from BSBs	VS1, VS6	VS4,	3	<i>"...We had experiments that required both graphical and tabular representation of the data at the end of the experiment. Especially in the experiment "Let's find the equilibrium constant", we had to reach the equilibrium constant by interpreting the graphs to be drawn with the help of the data. As in this experiment, some of our groupmates used the graphs drawn instantly on the PC tablet instead of drawing them themselves in advance." (VS6)</i>
D3	Sensitivity and high cost of sensors	VS1, VS3, VS5, VS6	VS2, VS4,	6	<i>"At the beginning of the lesson, our teacher told us that experiment sets with sensors are quite costly. Since the new version of the sets had just been released, he mentioned that it would be difficult to find spare parts for these sets and told us to use them carefully. This worried us" (VS6).</i>

The second question of the interviews was "On the PC tablet screen, one of the mobile technological devices, there were synchronized table and/or graphical displays for your related experiments. Do you think that the instantaneous nature of these displays provided any benefit for you to draw graphs independently? Explain with your justification". The answers given by the students to this question of the interview were analyzed and codes were created. The codes extracted as a result of the answers given and the sample answers given by the students are presented in Table 3.

Table 3: Student responses and frequencies to the second question of the interviews

Code No	Code	Participants	f	Excerpts from student responses
*DIGBS1	The instantaneous nature of table/graphic representations facilitates learning	VS2, VS3, VS5, VS6	4	<i>"...For example, in the gas laws experiment, it was very nice to see and interpret the instant graphs with the other variable affected by this change as soon as we changed a variable for each law" (VS2)</i>
DIGBS2	To teach drawing and interpreting tables/graphs independently	VS2, VS5	3	<i>"Since we had to reach conclusions about the graphs we drew in the activities, we were able to draw more accurate graphs with the help of the tables shown instantly. And the conclusions we reached could be more accurate" (VS3)</i>
DIGBS3	Passivating table/chart drawing	VS1, VS6	3	<i>"In some experiments, some of my groupmates were trying to conclude the experiments directly from the ready-made graphs instead of drawing independent graphs and comparing them with the graph on the PC tablet." (VS6)</i>

*DIGBS: Drawing and Interpreting Graphs by Self

In the third question of the interviews, the students were asked "In this study, you used sensors integrated with mobile technology in applications related to various chemistry subjects. So, in which other science subjects other than chemistry would you consider using these mobile technological devices and why? Explain your reasons with your examples". The answers given by the students to this question of the interview were analyzed and codes were created. The codes extracted as a result of the answers given and the sample answers given by the students are presented in Table 4.

Table 4: Student responses and frequencies to the third question of the interviews

Code No	Code	Participants	f	Excerpts from student responses
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Physics	Presenting examples of physics topics	VS1, VS3, VS6	VS2, VS4	5	<i>"For example, among the sensors, we can use current and voltage sensors in experiments related to the subject of "transformer" from physics" (VS2)</i> <i>"We can use the magnetic field sensor in the "Magnetism" unit" (VS4)</i>
Biology	Presenting examples of biology topics	VS3, VS6	VS5	3	<i>"I think oxygen or pulse sensors are super sensors, I think they are often used in the "Respiratory systems" unit" (VS3)</i> <i>"Our teacher mentioned the pulse sensor, it can be used in the unit "Circulatory systems" (VS5)</i>

In the fourth question of the interviews, the students were asked "What are your thoughts and suggestions about the contributions of laboratory applications with the help of sensors integrated with mobile technology to science education?". The answers given by the students to this question were analyzed and codes were created. The codes extracted as a result of the answers given and the sample answers given by the students are presented in Table 5.

Table 5: Student responses and frequencies to the fourth question of the interviews

Code No	Code	Participants	f	Excerpts from student responses
S1	Increasing self-confidence and motivation	VS1, VS3, VS5, VS2, VS4, VS6	6	<i>"As we used the equipment in the experiment sets more often, we were able to set them up more easily and perform experiments more easily. Our enthusiasm for laboratory practices increased." (VS6)</i> <i>"We looked forward to the lab class throughout the semester, we felt like we were the real owners of the lab" (VS2)</i>
S2	Increasing the ability to use technical tools	VS2, VS4, VS5, VS6	4	<i>"We are not unfamiliar with sensors, especially in the field of robotics and coding, we often heard about them, such as distance sensors or light sensors. In these sets, we learned much more types of sensors. We had experiences about how instantaneous changes are realized and visually given through a sensor." (VS4)</i>
S3	Enabling self-learning	VS1, VS3, VS4, VS6	4	<i>"I think it is enough for our teacher to teach the installation and use of the sensor kits, and then we can reach the results on our own by trial and error" (VS6)</i> <i>"These were the applications where we developed the ability to draw graphs on our own. At least we reached the correct drawings on our own by comparing them with the graphs on the PC tablet without asking our teacher" (VS4)</i>
S4	Ability to continue learning in out-of-school environments	VS1, VS2, VS6	3	<i>"As I mentioned before, we can use the sensors in the experiment set not only in the classroom but also outside the classroom. Because all the tools used in the whole set are portable." (VS1)</i>
S5	Time savings	VS1, VS3, VS5, VS2, VS4, VS6	6	<i>"We do not carry out laboratory applications very often, but in some of the applications we did, since the experimental process took a lot of time, the conclusion and/or discussion of the data obtained from the experiment was given as homework. In these applications, we were able to complete all of them in the same class period" (VS6)</i> <i>"I think the biggest contribution of these apps is that they save time. But I think these applications should be built in. In this way, we can do laboratory practice more often." (VS4)</i>

4. Discussion

Prior to the applications, it was determined that the 11th grade students participating in this study had a low level of readiness for self-directed learning ($X=83.58$). This situation is considered to be originated from the fact that in addition to in-class theoretical teaching of the subjects in high school level science courses, limited activities of laboratory applications are carried out with classical experimental instruments and closed-ended laboratory approaches in cookbook format. Based on this basic problem situation, students' and teachers' guidance materials suitable for laboratory applications with sensors integrated with mobile technology were developed in the present study to be used in teaching various chemistry topics (Gas Laws, Colligative Properties, Solubility, Chemical Equilibrium: Let's Find the Equilibrium Constant). It is thought that these guide materials will support the development of students' self-directed learning skills. At the same time, it is aimed to contribute to improving the quality of teaching by taking student opinions about the activities at the end of the study. Following the chemistry laboratory applications carried out with the help of sensors integrated with mobile technology, it was determined that there was a significant increase in students' readiness levels for self-directed learning and the scores obtained were in the average category ($X=106.48$, $p<0.005$). Today, self-directed learning has attracted great attention at all levels of education, especially in the field of adult education. In recent years, educators have begun to pay more attention to the idea that learning does not have to be connected to school (Keeton, 1976; Fisher et al., 2001). Even when learning takes place in connection with an educational institution, some individuals may respond better when given more opportunities for self-direction in the learning process (Guglielmino, 1977). The term "self-directed learning" has been used to describe behaviors ranging from participation in programmed learning (Campbell, 1963) to the self-initiated, self-planned activities of self-directed learners such as Maslow's self-actualizing individuals (Maslow, 1969; 1970).

Self-directed learning is defined as the ability of students to identify their own learning needs and goals without the help of others, to identify the necessary human and material resources, to identify appropriate learning strategies and to evaluate the results of learning (Fisher et al, 2001). Constructivist learning approach, which integrates laboratory environments that require the use of mobile technological tools, is one of the most effective learning approaches that can develop this ability. In the study, it was observed that the mobile technology supported 5E learning model led to an increase in students' readiness for self-directed learning. These results support the results of Okur (2014; 2021), Okur & Güngör Seyhan (2022) and Güngör Seyhan & Okur (2022) studies using strategies, methods and techniques within the constructivist learning approach in which technology is integrated.

At the end of the study, the students stated that the necessary data in their experimental applications was obtained in a short time through the sensors in the related mobile technological devices and this was a great advantage. The students also stated that they think that the "learning" process can happen by itself and independent of the teacher, as mobile technological devices such as these experimental sets are independent of time and space. It is observed that learning activities that will take place outside of school, when applied in a planned and systematic way together with the science curriculum used in in-school learning, make significant contributions to science learning and teaching in students (Luehmann, 2009; Tatar & Bağrıyanık, 2012; Güngör Seyhan & Çelik, 2021). The students stated that the activities carried out with mobile technological devices have advantages such as "it facilitates data recording and helps in graphic drawing". It is thought that the feature of recording data, as in these computerized systems, provides an important advantage for students to return to related data and graphics when they feel the need, even in the future, to increase their learning in related subjects (Güngör Seyhan & Okur, 2020; 2022). Students with personal mobile devices, from phones to laptops, can quickly access internet resources to support self-study. The increasing importance of information in the information age has led institutions to seek new methods to access information. At home and on the go, students value the opportunity to get quick access to learning resources and engage in non-formal learning. Some experts define devices, especially the Internet, as a technology that plays an important role in the process of knowledge transfer in order to apply different approaches in education. This process is done through familiar tools and interfaces without intrusion into their online social space. These technologies have an important role in education in terms of efficiency and making learning an enjoyable activity (Güngör Seyhan & Okur, 2022).

5. Conclusions

In recent years, it has become important to prefer an andragogic learning environment in which students prefer to take their own responsibility in meeting their own learning needs, unlike pedagogical learning, which is more dependent on the teacher in determining learning needs, formulating goals, planning and implementing learning activities, and evaluating learning. Undoubtedly, constructivist learning approach is one of the educational environments in science education that enables students to increase their responsibility for their own learning, to have more control over the teaching of targeted concepts, facts and events, and to be active and active in accessing information inductively. At each stage of the learning models in this learning approach, students are active and take more responsibility for their own learning in accessing information. Furthermore, students are encouraged to use tools and technology to conduct scientific research. Learning using mobile devices such as tablet computers facilitates teaching. Since wireless technology can be used anywhere, it also creates learning opportunities in out-of-school environments. This learning model is learner-centered in nature and supported by technology. Learning environments in which mobile technological devices are integrated provide the opportunity to access information anytime and anywhere. In this way, researcher-inquisitive learning-teaching in both classroom and laboratory environments will continue to function in realistic environments. Therefore, as in science education, mobile technological devices have been included in learning-teaching environments more and more in recent years. While preparing plans and programs, adopting mobile technologies as a tool rather than a target will provide a more effective use.

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An Examination on the Visuals in the Reading Texts of the Turkish Teaching Textbooks for Foreigners

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Abstract

There are various textbook sets commonly used in teaching Turkish to foreigners. In the literature, the literary content of these books has been examined by many researchers. However, there have not been enough studies on the visuals, which are as important as the texts in the books. The visuals belonging to the texts in the Gazi University Turkish Textbook for Foreigners Level C1 were examined in this research. In this study, document review method, which is one of the qualitative research designs, was used and 39 visuals used with 20 texts in the book were examined by the researcher and 3 experts in terms of their compatibility with the content of the texts. The visuals in the book were first grouped according to Levin's (1981) typology and it was determined that 97.42% of the visuals are representative and appropriately decorative. Then, the compatibility of the images with the texts was examined according to a five-item category list. It has been determined that helpful visuals are used in the book to predict the subject of the text, which is compatible with the content of the text. However, it has been concluded that the visuals are found insufficient to contribute to the comprehensibility of the text, to emphasize the important points in the text, and to support the main idea/emotion of the text. Suggestions were made regarding the use of organizational, explanatory and transformational visuals that contribute more to the understanding of the text in Turkish as a foreign language books.

Keywords: Function of Images, Textbooks, Turkish as a Foreign Language, Visual-Text Compatibility

1. Introduction

Textbooks are one of the most important materials for educational activities. In-class practices and assessment-evaluation activities are shaped in compliance with selected textbook. Textbooks used in foreign language teaching are designed to develop four main language skills. For this reason, the books usually include a text, vocabulary and comprehension exercises for the text, speaking, writing and listening sections relevant to the subject and sometimes grammar exercises. Visuals are used both as a design element and as a teaching material, starting right from the cover of the book. Colors, fonts and font sizes, placement of photographs and illustrations form the design and these elements provide an overall impression of the book. Visuals are also included in activities related to all language skills as a teaching element.

Texts form the backbone of textbooks in language teaching. The teaching and learning cycle commonly begins with the teacher's understanding of the text in the book, culminates with students' understanding of the same text, and continues with the teacher repeating the same cycle in another text. Therefore, texts have a vital role in the teaching and learning process (Peacock, 1995). In foreign language teaching, texts provide linguistic input in the classroom environment, enabling students to see the use of words in various contexts and the application of grammatical rules in a meaningful whole.

Various topics in the texts contribute to the self-improvement and general knowledge of students by increasing their level of knowledge. Additionally, it provides students with cultural awareness through clues about the worldview and lifestyle of the target language that it contains implicitly. Thus, the texts in the textbooks used for foreign language teaching should be selected carefully.

As well as serving as the main element to improve reading comprehension skills in language teaching, texts play an important role in the development of speaking and writing skills as well. Texts not only create a context in which students can express themselves in writing or verbally within the content, but also reflect the original use of the target language's stereotypes in this context. Besides, a complete comprehension and understanding of a text in the book for students creates a sense of achievement and contributes to the continuation of language learning motivation. Thus, ensuring that the texts are understood by the students is also an issue that should be taken into account in language teaching.

Starting from the end of the twentieth century and the beginning of the twenty-first century, there has been a great increase in making use of visuals rather than texts for transferring and communicating information in textbooks (Kress, 1995 as cited in Unsworth, 2006). In today's textbooks, visuals occupy a larger place than texts and almost all of the texts are presented with visuals. Because images are message fields just like texts and they are deemed much more permanent than texts. When the visuals are used in compliance with the design principles and also if they are compatible with the content of the text, they facilitate learning, enhance and increase the effect of the text. It helps the reader concentrate on the most important piece of information. They attract students' attention, embody the words and thoughts in the text, create a stimulating richness by activating different senses simultaneously (İşler, 2003; Kayabekir & Tepecik, 2018; Tabak, 2012).

Mayer (1981) stated that the visuals that take place in the texts have five functions: decorative, representational, organizational, explanatory/interpretive, and transformational. For example, an image with trees of the same species that is used to represent a hiking trail is only decorative because it does not have much to do with the content of the text. However, an image in which the scene in a story is illustrated in accordance with what is described in the text is representative because it reflects a part of the text. Visuals like graphics, figures, maps, etc. that are used to better communicate the content of the text have an organizational function. Visuals that are generally used to understand difficult texts written on scientific or technological subjects, and which depict the cause-effect relationships or process steps mentioned in the text are explanatory/interpretive. Visuals such as mind maps and keyword illustrations are used to help readers remember the information in the text have a transformational function (Carney & Lenin, 2002).

Teaching Turkish as a foreign language is carried out by institutions both in Turkey and abroad. Book sets from the publishers like Hitit, Yedi İklim, Gazi and Istanbul are amongst the most preferred textbooks. These books have been studied by many researchers in terms of cultural transfer, grammar teaching, vocabulary, language skills etc. However, the number of studies on the visuals in the books is not sufficient (Kaplan, 2021). The visual design of the textbooks, which is as important as the textual content, is an issue that should be taken into consideration in teaching Turkish as a foreign language. The subject of this research is the function of the visuals used in the reading texts of the textbooks that focuses on teaching Turkish as a foreign language and their text-visual compatibility. In this research;

1. According to Levin's (1981) typology, in which functions are the visuals in the textbooks used in teaching Turkish as a foreign language?
2. What is the level of compatibility between reading texts and the visuals in the textbooks used in teaching Turkish as a foreign language? questions will be answered.

2. Method

As this research is based on interpreting the images in Turkish as foreign language textbooks, document analysis method was adopted within the scope of qualitative research. Document review is a scientific research method that can be characterized as collecting, reviewing, questioning and analyzing various documents as the primary source of research data (O'leray, 2004, cited in Özkan, 2021).

2.1. Sample

C1 level of Gazi University Turkish Textbook for Foreigners Level C1, which is widely used in teaching Turkish as a foreign language, was examined in this research. C1 Level refers to the professional user according to the Common European Framework of Reference for Languages. The texts and reading passages at this level are more comprehensive and relatively challenging in terms of both subject matter and vocabulary usage. Therefore, it is deemed that visuals are very important at this level to contribute to understanding of the text.

2.2. Data Collection Tools

The data were collected through a form prepared by the researcher, consisting of two parts. In the first part of the form, there are boxes that will be used to tick to determine which of the five categories in Levin's (1981) typology the visual belongs to. In the second part of the form, there is a visual-text compatibility category list consisting of 5 questions about visual-text harmony. The work of İşcan and Kanca (2021) was used in the creation of this list.

2.3. Analysis of Data

In order to ensure reliability in this study, support was received from 3 additional experts other than the researcher herself. Two of these experts are teachers working in the field of teaching Turkish as a foreign language. The other one is a visual arts teacher. 39 visuals in 20 texts analyzed within the scope of the research were evaluated by these four people.

In the first part of the form, the visuals were categorized according to their functions and the formula of Tavşancıl and Aslan (2001) "Reliability = Number of agreement/Agreement + Number of disagreement" was used to predict the consistency between researchers, and the result was found to be 0.92. A result higher than 0.70 means an acceptable level of agreement. Therefore, the result of this study shows that there is a reliable level of consistency amongst the experts.

Whilst evaluating the visual-text relationship in the second part of the form, the arithmetic averages of the opinions were used by making use of the work of İşcan and Cımbız (2018). In calculating the scores, Yes (2), Partly (1) and No (0) were assumed and the score range was calculated as 0.66 with the formula "Highest value – lowest value)/3". The range 0 – 0.66 was calculated as no, the range 0.67 – 1.33 was calculated as partially and range 1.34-2 was calculated as yes.

The data were interpreted according to the predetermined titles using descriptive analysis method. Each image was rated individually by the participants and arithmetic mean was calculated for each image. Then, the scores of all the images were compounded to reach an overall result.

3. Findings

In this section, firstly, the findings about the functional categories of the visuals in the Gazi University Turkish Textbook for Foreigners Level C1 book will be presented. Then, findings on visual-text compatibility will be included.

Table 1: Distribution of visuals by functional categories in the texts in the Gazi university turkish textbook for foreigners level C1

Function	<i>f</i>	%
Decorative	17	43.58
Representative	21	53.84
Organizational	1	2.58
Descriptive/ Interpretive	-	-
Transformational	-	-
Total	39	100

When Table 1 is inspected, it can be observed that the texts in the Gazi University Turkish Textbook for Foreigners Level C1 include the visuals with the most representational function with a rate of 53.84%. Next there are decorative visuals with a rate of 43.58%. While the organizational visual is used only once among 39 visuals, it was seen that visuals with explanatory/interpretive and transformative functions are never used.

It is customary to use representational images extensively in textbooks. Moreover, the subject of the text must be appropriate to be able to use explanatory/interpretive visuals. When Gazi textbook was examined, it was ascertained that although the subject was appropriate, visuals with high-level functions were not included. For instance, Figure 1 is used in the text "Air Conditioning for Shoes (Climashoe)", where a sneaker with a propeller is described in detail.

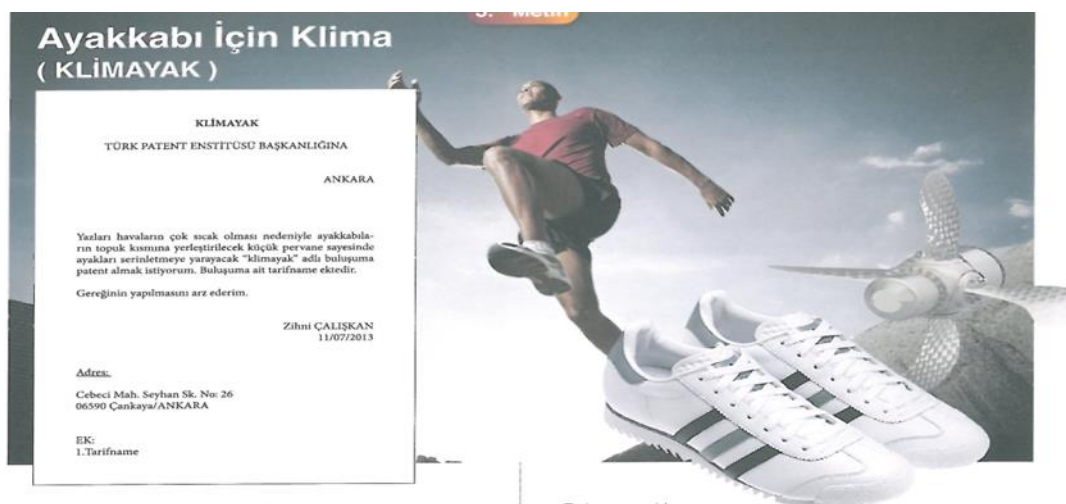


Figure 1: Image that belongs to the air conditioning for shoes text

In the text, the technical features of the shoes are “...the propeller will use solar energy which will be placed on the heel section is intended to prevent sweating and odors by providing air inside of the shoe with the air channels on the sole.” explained in detail. In the visual used in the text (Figure 1), the image of a sneaker and a propeller is included in order to reflect the content of the text. However, these two images are far from representing the shoes mentioned in the text.

In the following sections of the text, it is mentioned that there are four images reflecting the “...top view of the sole of the shoe, the view of the solar powered propeller, the top view of the shoe, the right and left side views of the shoe...”. However, neither these images nor an image appropriately representing the above mentioned invention are included in the book.

When the visuals in Gazi University Turkish Textbook for Foreigners Level C1 are examined, it seems that visuals were selected from readily available stock images or illustrations on the internet. For instance, the text which includes a short summary of the famous writer Cengiz Aytmatov's novel, The White Ship has no illustrations relevant to the story; instead the following images (Figure 2.) were preferred.

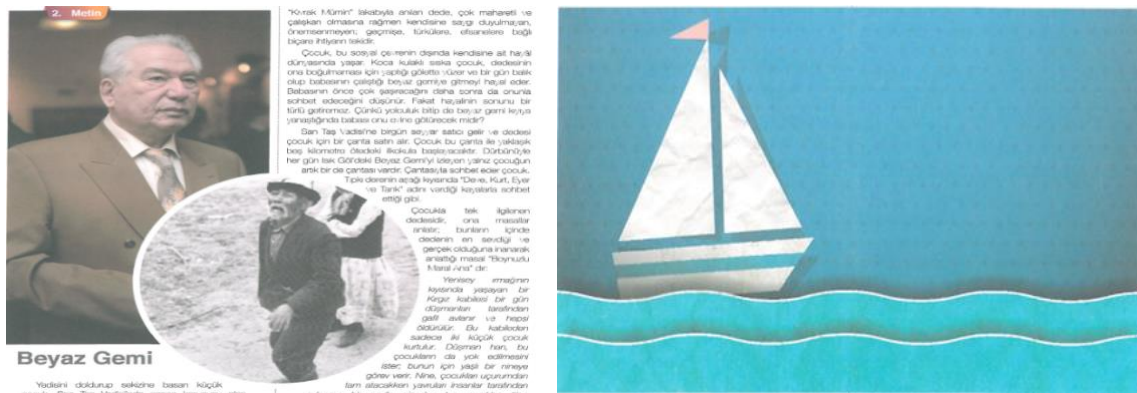


Figure 2: Images that belong to the White Ship text

A reason for this situation could be that an artist or visual design expert wasn't employed during the preparation of the book.

Findings regarding the compatibility of the visuals with the texts according to the "Image - Text Compatibility Category List" in Gazi University Turkish Textbook for Foreigners Level C1 are presented in the table below by providing frequency and percentage values .

Table 2: “Image-Text Relationship Category List” of Gazi University Turkish Textbook for Foreigners Level C1
Frequency and Percentage Distribution

Visual-Text Compatibility Category List	Yes	Partially	No	Total
Visual help to predict the topic of the text	<i>f</i> 21	12	6	39
	% 53.84	30.76	15.4	100
Visual is compatible with the content of the text	<i>f</i> 21	14	4	39
	% 53.85	35.90	10.2	100

Visual highlights the important points in text	<i>f</i>	3	22	14	39
	%	7.70	56.40	35.9	100
Visual contribute to the comprehensibility of the text	<i>f</i>	8	14	17	39
	%	20.51	35.90	43.5	100
Visual supports the main idea/main emotion of the text	<i>f</i>	6	16	17	39
	%	15.40	41.01	43.5	100

Table 2 contains data on the reading comprehension texts in the Gazi University Turkish Textbook for Foreigners Level C1 and the compatibility of the visuals used with these texts. A total of 39 visuals are included in the 20 reading texts in the book. Each of these images was scored by the researcher and 3 experts according to the categories in the table. Afterwards, the average scores of all images were calculated and the frequency and percentage values were attributed.

When Table 2 is examined, it could be observed that 21 of 39 visuals related to the texts in the book help predict the text and 12 of the visuals help just partially. It is understood that 6 visuals do not contribute to presuming the subject of the text. Considering this item, it could be stated that the visuals in the book contribute to estimating the subject of the text, since the sum of the "Yes" and "Partly" values are 84.6%.

If we look at the second item in Table 2, which examines the compatibility of the visuals with the content of the text, it could be observed that 53.85% "Yes", 35.90% "Partly" and 10.25 "No" answers are provided. Considering the fact that more than half of the images are compatible with the content of the text, and 35.90% of them are partially compatible, we can suggest that the images used in the Gazi University Turkish Textbook for Foreigners Level C1 are compatible with the content of the text.

Whereas we look at the item about the visuals reflecting the critical points in the text, it could be seen that the expression "Yes" is included in only 3 visuals with a rate of 7.70%. It is clear that 22 images used together with the texts partially emphasize the prominent points, while 14 images do not. When the results are considered, it can be stated that the visuals used in the Gazi University Turkish Textbook for Foreigners Level C1 does not properly meet the expectations in terms of emphasizing the important points in the text. It can be considered that lack of organizational visuals has an effect on the emergence of this result.

In the fourth item, which examines the contribution of the visuals to the comprehension of the text, it is shown that the highest rate (43.59%) was "No", followed by the answer "Partially" with 35.90%. The fact that the rate of "yes" answer is at the level of 20.51% enables us to conclude that the visuals used in Gazi University Turkish Textbook for Foreigners Level C1 are not sufficient to contribute to the comprehension of the text. It could be considered that the lack of explanatory/interpretive visuals in the book contributed to this conclusion.

It is shown that the highest rate (43.59) was "No" and very close to it (41.01) is the answer "Partially" for the last item, in which the visual support of the main idea / main emotion of the text was examined. Only 6 of the 39 visuals used in the book emphasize the main idea of the text. Therefore, it can be concluded that the visuals used in the Gazi University Turkish Textbook for Foreigners Level C1 are not at the desired level to reflect the main idea/emotion of the text.

4. Discussion and Conclusion

The adventure of teaching Turkish as a foreign language, which started with the need to teach Turkish to university students who came to Turkey with student mobility programs in the 1980s, continues rapidly both in Turkey and abroad through institutions such as Turkish Teaching Centers in many universities, Yunus Emre Institute and TİKA. As the number of foreigners who want to learn Turkish is increasing day by day, the number of materials prepared to teach them Turkish is increasing at a similar rate. Resources such as short films, audio recordings, dictionaries, books, lecture videos can be easily accessed on the internet. While in institutions, textbooks are used as the main material.

In order to teach Turkish as a foreign language in a better quality, the textbooks used should also be of high quality. In the literature, mainly the verbal/literary content of the books for teaching Turkish as a foreign language has been examined and suggestions have been made in order to improve and develop it. There have been very few studies on the visual content of the books. Whereas, the visual materials used in the books are as important as the verbal content of the books (Kaplan, 2021). Visuals provide rich content in the development of basic language skills, understanding the social and cultural dimensions of language, and increase learning motivation (Gün and Ünal, 2019). Reading texts and visuals are used together in textbooks to improve reading skills. In order to ensure better learning, the visuals should match the semantics of the text (Kayabekir & Tepecik, 2018). In other words, the concepts mentioned in the text should also be included in the visual so that it contributes to the students' understanding of the concepts in the text. Otherwise, juxtaposition of the picture and the text, which are disconnected from each other, will not contribute to the construction of meaning (Gün and Ünal).

In this study, 39 visuals used for 20 reading texts in Gazi University Turkish Textbook for Foreigners Level C1 were examined. Images were first grouped according to Levin's (1981) typology. It has been shown that 21 of the visuals have a representative function, 17 of them have a decorative function and one of them has an organizational function. It has been determined that visuals with explanatory/interpretive and transformational functions are never used in the textbook. Şimşek (2021) reached a similar conclusion in his study. In the research concerning the visuals of the book, *Journey to Turkish; Teaching Turkish as a Foreign Language (Türkçeye Yolculuk; Yabancı Dil Olarak Türkçe Öğretimi)* he stated that representative visuals stood out prominently, while decorative visuals took the second place. However, in terms of contributing to the learning and comprehension of the text, decorative visuals have almost no effect, while representational visuals provide more moderate and transformative visuals very high impact (Levin, 1981, p.68). Many teachers try to draw attention to the subject based on what students see in the images. Notwithstanding there is a high rate of decorative visuals that are not related to the subject in the books and it is a great waste of effort for those who prepare the book, and a great loss of opportunity for teachers and students (Hill, 2013).

In the second part of the study, a five-article category list was created in order to investigate the compatibility level of the texts with the visuals in Gazi University Turkish Textbook for Foreigners Level C1 and the visuals were evaluated by four experts. In the first article, the contribution of the visuals to estimating the content of the text was investigated. The answer was "Yes" at a rate of 53.84%. Therefore, it was concluded that the visuals used in the Gazi textbook helped to predict the subject of the text. İşcan ve Kanca (2021) inspected the Gazi Turkish for foreigners textbook Level A1 and A2 and reached a similar conclusion. The researchers, who reached a high rate of 79.55% at the A1 level and 81.48% at the A2 level, concluded that during preparation stages of the books, the team paid attention to the fact that whether the visuals are contributing to making predictions and making inferences about the text.

Second, this article investigates the levels of representation of the visuals. The answer was "Yes" for 21 visuals used together with the texts, "Partly" for 14 visuals and "No" for 4 visuals. Therefore, it was concluded that the majority of the visuals in the Gazi textbook were compatible with the texts. Ömeroğlu (2016) analyzed four books that are widely used in teaching Turkish as a foreign language, including the level A1 of the Gazi teaching set, and stated that the books are at an "adequate" level in terms of visual-subject harmony. Conclusion of Ömeroğlu's research is similar to the result of this research. Ersoy (2019), on the other hand, examined the views of the instructors who teach Turkish as a foreign language about the visuals in the A1 level books. In his research, he

stated that instructors agree on the view that the compatibility of the visuals with the texts was not of the required level and they perceive this as a problem. Ersoy's research and the results obtained in this study are not in the same direction.

In the third, this article regarding the visuals' emphasizing the important points in the text, the highest rate (56.40%) was found to be "Partially" and the second was "No" (35.90). The answer "yes" being only 7.70% indicates that the visuals in the Gazi textbook are not adequately effective in emphasizing the prominent points in the text. Telçeker Sertoğlu (2019) examined the teachers' views on the visuals in the Istanbul Turkish for Foreigners set and concluded that the items related to the targeted topic in the texts were not prominently included in the visuals. This view expressed by the teachers for the Istanbul textbook set was found to be in parallel with the conclusion reached in the Gazi textbook examined within the scope of the research.

According to the results obtained in the fourth item, while 17 of the examined visuals did not contribute to the understanding of the text, 14 of them contributed partially. "Yes" answer for only 8 visuals shows that the visuals in the Gazi C1 book do not contribute enough to the understanding and comprehension of the text. However, the most important contribution of visuals is to facilitate the understanding of the text. Beginner level learners of Turkish can understand the content of the texts more efficiently with the help of visuals (Şeref & Yılmaz, 2013).

Finally, in the article about reflecting the main idea/emotion of the text, the answers of "No" (43.59%) and "Partly" (41.01%) show that the visuals are insufficient in reflecting the main emotion of the text. This is consistent with the data obtained in the first part of the research. In Gazi C1 level textbook, visuals with almost purely representational and decorative functions are included. Such visuals only serve to guess the subject and to have superficial information about the content. If visuals are intended to provide high-level benefits such as ensuring the understanding of difficult concepts in the text, emphasizing important points, and supporting the main idea, organizational, explanatory and transformational visuals should be included more in the textbooks.

Attention should be paid to the visual content just as much as the written content in the preparatory stages of textbooks for teaching Turkish to foreigners. Visuals should be more carefully selected in terms of both design and relationship and compatibility with texts, and if necessary, they should be created by artists. Additional research on the visuals in the existing textbooks can detect deficiencies and thus contribute to the improvement of the visual design of the books in newer editions.

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Comparison of Undergraduate Social Studies Instruction Program Elective Course Content and Social Studies Curriculum (2018) Objectives*

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Abstract

The 2018 Undergraduate Social Studies Instruction Program included 13 elective field courses. The pre-service teachers should select six elective courses to graduate. The present study aims to compare the content of the above-mentioned elective field courses and the 4th, 5th, 6th and 7th grade social studies curricula (2018) objectives. In the present qualitative study, the data were collected with the document analysis technique. The qualitative study data were analyzed with the Miles & Huberman (1994) reliability formula and the inter-coder agreement was determined as 91.4%. It was determined that 24 objectives in the Turkish Judicial System course, 21 objectives in the Turkish Economy course, 15 objectives in the Globalization and Society course, 10 objectives in the Environmental Education course, 9 objectives in the Historical Evidence in Social Studies Instruction, Local and Oral History, and Information Technologies in Social Studies courses, 8 objectives in the Maps and Applications course, 2 objectives in Current Global Issues, Regional Children's Games in Social Studies Instruction, and Material Design in Social Studies Instruction courses were associated with the social studies curriculum objectives. The objectives specified in Evaluation of In-Classroom Learning, Social Studies Textbook Review, and Drama in Social Studies Instruction courses were not associated with curricular objectives.

Keywords: Social Studies, Elective Field Courses, Curriculum

1. Introduction

The social studies course, described as a primary education course developed based on mass education approach to help the individual realize social self-existence, that includes social sciences such as history, geography, economics, sociology, anthropology, psychology, philosophy, political science, law, and citizenship topics, aims to unify the related learning areas in units or themes, and examines the past, present and future interactions between humans and social and physical environment (MEB, 2005), is a pedagogical course based on social sciences, although the name of the course has been changed several times in the Republic of Turkey history.

* This study was presented as an oral presentation in X. USBES.

The quality of education mainly depends on the quality of teachers. Course aims are only achieved by teachers equipped with the instructed knowledge and skills in a course. Teacher is an individual who graduated from the educational institutions as required by the state and provide general culture, special field and pedagogical formation training, and fulfills the associated duties in accordance with the aims of Turkish National Education (METK, 1973).

In Turkey, teacher training duty was transferred to colleges in 1982, and the most recent curricular regulation that aimed to improve teacher training was enacted in 2018. Previously, the curricula were revised in 1997, 2006 and 2009. Due to the current developments in educational sciences and teacher training, and the structural changes in the Turkish educational system, social needs and demands, restructuring the faculties of education/educational sciences and revision of the teacher training undergraduate programs became a necessity. The new undergraduate teacher training programs were developed and published by YÖK (URL-2).

The revised 2018 Undergraduate Social Studies Teaching Program included 44 hours of theoretical and 12 hours of practical vocational knowledge courses, 26 hours of theoretical and 2 hours of practical general culture courses, and 70 hours of teaching practice courses. Pre-service social studies teachers take 28 compulsory and 6 elective courses out of a total of 34 courses in 8 semesters. The elective course pool was determined in the YÖK Undergraduate Social Studies Teaching Program as follows (URL-1):

Social Studies Instruction Elective Field Course Pool and Course Content

Environmental Education: Basic ecological concepts and principles, ecosystems, food chains, food network, habitat, competition, symbiosis and mutual living, energy flow, circulation of matter, population growth, ecological impact, erosion, soil and water resources, environmental awareness, global studies, institutions and organizations on environmental awareness, environmental education in secondary education curricula.

Current Global Issues: Global political, economic, ecological and social issues, investigation of problems such as hunger, poverty, human rights, population, racism, terrorism, landslide, erosion, earthquake, flood, drought, avalanche, traffic, noise pollution, water pollution, soil pollution, urbanization, drug addiction, energy problem and solutions, alternative approaches, environmental education, the significance of social studies course in these topics, sustainable society discussion and education.

Maps and Mapping Applications: Maps, mapping techniques, map types and implementations, concepts associated with map use and maps in social studies instruction, mapping applications for the instruction of spatial perception skills, mapping and effective mapping applications.

Globalization and Society: Globalization and its effects on Turkey, global developments in the last century, environmental changes, military and economic alliances, effects of globalization on developing nations, Turkey's status in globalization, concepts such as pluralism and multiculturalism (and their significance in social studies instruction) and multicultural education practices.

Evaluation of In-Classroom Learning: Measurement tools employed in education and their features, conventional tools; written exams, quizzes, true-false type tests, multiple choice tests, matching tests, oral exams, multidimensional tools to learn about the students; observation, interviews, performance evaluation, student product files, research papers, research projects, peer assessment, self-assessment, attitude scales, student achievement measurement approaches; learning objective assessment and grading.

Social Studies Textbook Review: Physical, educational design, visual design and lingual expression standards in the textbooks, the adequacy of the textbook content for the program, review of certain existing textbooks based on of content, language, suitability for student level, format, attractiveness, contribution to meaningful learning, ease of instruction, etc.

Regional Children's Games in Social Studies Instruction: Theoretical knowledge on national and regional games and children's games (regional and other games such as knucklebones, tipcat, etc.), the employment of these games in social studies course, practical examples.

Drama in Social Studies Instruction: Definition and meaning of drama, the concepts of psychodrama, creative drama, socio-drama, etc., drama-game relationship, history of drama in education, the structure and application stages of drama in education, drama environment and teacher qualifications, evaluation of drama, the development and application of drama, adequate educational examples.

Material Design in Social Studies Instruction: The employment of field-specific instructional technologies, software types and intended use, educational material design and development principles, determination of material requirements, two- and three-dimensional instructional material design, worksheets, slides, development of instructional material such as VCDs, DVDs, MP3 and MP4 files, in-classroom use of various instructional materials.

Historical Evidence, Local and Oral History in Social Studies Instruction: Theoretical knowledge on historical evidence, local and oral history, research and practice, theoretical and practical examples of historical studies in social studies instruction.

Information Technologies in Social Studies: The employment of computers, mobile phones, other mobile devices, smart boards and the internet in social studies instruction, instructional activities based on information technologies, the employment of social media tools for curricular achievements, applications that aim to improve the competence of pre-service teachers in educational software.

Turkish Judicial System: Basic legal concepts, the origins of modern jurisdiction, historical legal developments in Turkic societies, and contemporary law in Turkey, instruction of required pre-service teacher skills for citizenship, rights and responsibilities instruction and related applications (court judgement analysis, case studies, local and national petitions, etc.).

Turkish Economy: Basic economic concepts, Turkish macroeconomy, related learning areas in social studies (especially production, consumption and distribution learning areas) and instruction of related knowledge, skills, and applications.

Literature review revealed that several studies have been conducted on social studies curricula. These studies were on oral history (Dere, 2018), gender (Başaran, 2019), citizenship (Aydemir, 2018; Şen, 2019; Şiraz & Bay, 2020), social studies instruction approaches (Yalçın & Akhan, 2019), social identity (Karasu Avcı & İbret, 2018), skills (Çoban & Akşit, 2018; Demir & Özyurt, 2021), geographical concepts (Kaçar & Bulut, 2020), multiculturalism (Taş, 2019), women (Tatan, Demir & Oğuz Haçat, 2020). Furthermore, certain studies focused on the analysis of social studies teacher training programs (Akarsu, et al., 2020; Çoban, 2010; Ercan, 2009; Kaymakçı, 2012; Sağdıç, 2018; Tonga, 2012). Kınacı (2021) compared the social studies teacher training programs and curricula that were effective in different periods, and analyzed the course- objective relationship based on various content categories (History, Geography, etc.).

In contrast with previous studies, the current study aimed to focus on singular elective course content in the 2018 social studies teacher training program and determine the number of acquisitions associated with the curriculum in each course content.

The present study aimed to investigate the elective field courses in the undergraduate social studies instruction program and to match the objectives specified in each course with those mentioned in the social studies curriculum. Thus, the following research questions were determined:

Do the environmental education, current global issues, maps and mapping applications, globalization and society, evaluation of in-classroom learning, social studies textbook review, regional children's games in social studies instruction, drama in social studies instruction, material design in social studies instruction, historical

evidence local and oral history in social studies instruction, information technologies in social studies, Turkish judicial system, and Turkish economy course content are associated with the 2018 social studies curriculum objectives? If so, what is the distribution of the number of objectives in the relevant course content based on grade level?

2. Method

2.1. The Research Design

The present study was designed with the qualitative research method. Qualitative research design tackles the richness, texture, and state and feelings associated with raw data, and aims at the comprehension of the collected data collected with an inductive approach (Neuman, 2014). Qualitative research has several advantages over quantitative research. It is more open to innovation; and thus, providing various opportunities to develop novel study designs. The researchers could be creative in effective language use (Creswell, 2014). In other words, the qualitative paradigm allows the researchers to play a dominant role in data collection and analysis (Merriam, 2013). Qualitative research employs data collection methods such as observation and document review. It entails a holistic investigation of events and facts in a realistic setting. Due to these advantages, it was concluded that the comparison of social studies course curriculum achievements and undergraduate social studies instruction program elective field course content would be possible with in depth analysis of the data. Thus, document analysis, a qualitative data collection technique, was preferred in the study.

2.2. Data Collection

In the study, study data were collected with the document analysis technique, a qualitative data collection method.

2.2.1. Document Analysis

In document analysis, all types of official and private documents could be reviewed. Document analysis could be preferred in studies where data could not be collected with surveys, observations or a measurement instrument (Mayring, 2011). The document analysis technique provides several advantages. These include rich material sources, ready-to-use data, error control, and objectivity when compared to the above-mentioned data collection instruments (Merriam, 2013). Due to the above-mentioned advantages and requirements, the authors preferred the document analysis technique. Based on the aim of the study, the 2018 Social Studies Curriculum and the undergraduate social studies teaching program were analyzed in the study.

2.3. Data Analysis and Interpretation

The study data were analyzed with the descriptive analysis method.

2.3.1. Descriptive Analysis

Description is the foundation of qualitative research, and its primary aim is to help the reader observe what the author sees and hear what the author hears (Wolcott, 1994). In descriptive analysis, the data are presented based on main themes, categories and sub-themes, including direct participant quotes, manuscripts and observation notes (Saldana, 2003). The data should be described with direct quotes from the collected study data (interviews, observations and documents). Furthermore, the data should be presented with a descriptive approach to determine the themes and correlation between the themes. In the present study, the authors initially analyzed the documents independently. Consistency was ensured by the collective reanalysis of the documents by the authors and an independent researcher. The qualitative data was analyzed with the Miles & Huberman (1994) reliability formula and the inter-coder agreement was determined as 91.4%. The study findings are presented in tables.

3. Results

The undergraduate social studies teaching program included 13 elective field courses. These are environmental education, globalization and society, current global issues, maps and mapping applications, drama in social studies instruction, evaluation of in-classroom learning, social studies textbook review, regional children's games in social studies instruction, material design in social studies instruction, historical evidence and local and oral history in social studies instruction, information technologies in social studies, Turkish judicial system, and Turkish economy courses. The content of these courses was compared with the objectives in the social studies curricula for various grade levels. Similar objectives in fourth, fifth, sixth and seventh grade curricula are presented in tables below.

Table 1: Comparison of environmental education course and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Environmental education	6 objectives	3 objectives	1 objective	0 objective	10 objectives
Sample Objectives	SS.4.3.3. Distinguishes natural and anthropogenic elements in their environment. SS.5.3.2. Explains the impact of the climate on human activities with Daily-life examples.				

As seen in the table, the environmental education course content and social studies course objectives were compared based on the grade level. It was determined that the course content was associated with 6 fourth grade social studies course objectives, 3 fifth grade objectives, and 1 sixth grade objective. The course content was not associated with any seventh grade objectives. It was observed that environmental education course content was associated with 10 social studies curriculum objectives at different grade levels. Table 1 includes certain associated objectives. The code next to the objectives refers to grade level, learning area and the objectives rank.

Table 2: Comparison of current global issues course and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Current global issues	1 objective	0 objectives	0 objective	1 objective	2 objectives
Sample Objectives	SS.4.3.6. Prepares for natural disasters. SS.7.7.4. Develop ideas for solving global problems with their peers.				

As seen in the table, current global problems course content and social studies curriculum objectives were compared based on the grade level. The course content was associated with one objective in the fourth grade curriculum, while it was not associated with any objective in the fifth and sixth grade curricula. It was associated with 1 objective in the seventh grade curriculum. A total of 2 objectives were similar in the social studies curriculum and current global issues course content, and these two objectives are presented in Table 2.

Table 3: Comparison of maps and mapping applications course and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Maps and mapping applications	3 objectives	1 objective	4 objectives	0 objective	8 objectives
Sample Objectives	SS.5.3.1. Indicates the landforms of the locality and surroundings on a map. SS.6.3.1. Defines the geographical position of the continents, oceans and Turkey with positioning concepts.				

In the table, mapping applications course content and social studies curriculum objectives were compared by grade level, and it was determined that 8 objectives were similar. The course content was associated with 3 fourth grade objectives, 1 fifth grade objective, and 4 sixth grade objectives. No seventh grade objective was associated with the course content. Two matching objectives are presented in Table 3.

Table 4: Comparison of globalization and society course content and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Globalization and society	3 objectives	4 objectives	4 objectives	4 objectives	15 objectives
Sample Objectives	SS.5.7.2. Discusses the effect of communication and transportation technologies on economic relations between countries. SS.7.7.4. Develops ideas and suggestions for the solution of global problems with peers.				

As seen in the table, 15 similar objectives were determined in the globalization and society course with the social studies course content in the comparison of the course content and social studies course curricula for different grades. It was observed that the course content was associated with 3 fourth grade objectives and 4 fifth, sixth and seventh grade objectives. Two matching objectives are presented in Table 4.

Table 5: Comparison of drama in social studies instruction, evaluation of in-classroom learning, and social studies textbook review courses and social studies curriculum objectives by grade level.

Course	Sosyal Studies Course Curricula 4th, 5th, 6th and 7th Grade Objectives (2018)
Drama in social studies instruction	0 objective
Evaluation of in-classroom learning	0 objective
Social studies textbook review	0 objective

The social studies curricula objectives were analyzed based on the courses mentioned in Table 5. The course content did not include any objectives listed in the curricula. Thus, it was determined that these three courses were not associated with the social studies curricula objectives.

Table 6: Comparison of regional children's games in social studies instruction course content and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Regional children's games in social studies instruction	2 objectives	0 objective	0 objective	0 objective	2 objectives
Sample Objectives	SS.4.2.3. Compares traditional children's games with current games based on differences and similarities. SS.4.7.3. Compares the cultural elements of various countries with the cultural elements of our country (focusing on visual and written communication tools and cultural elements such as dressing, food, games, family relations).				

The regional children's games in social studies instruction course content and the social studies curricula objectives were compared. Only 2 fourth grade objectives were determined in the course content. Course content was not associated with any objectives in other grade curricula.

Table 7: Comparison of material design social studies instruction course content and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Material design social studies instruction	2 objectives	0 objective	0 objective	0 objective	2 objectives
Sample Objectives	SS.4.2.1. Determines family history based on oral, written and visual sources and objects.				

Sample Objectives	SS.4.7.1. Introduces various countries (In-classroom presentation of the important features of the researched country with visual materials is ensured).
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The similar objectives in the material design in social studies instruction course content and the social studies curricula for various grades are presented in Table 7. The course content was associated with only 2 fourth grade objectives. There was no relation between the content and fifth, sixth and seventh grade objectives. These 2 objectives are presented in the table.

Table 8: Comparison of historical evidence, local and oral history in social studies instruction course content and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Historical evidence, local and oral history in social studies instruction	3 objectives	2 objectives	3 objectives	1 objective	9 objectives
Sample Objectives	SS.5.2.2. Introduces natural and historical assets, objects and artifacts in the vicinity SS.6.6.6. Recognizes the value of women in social life based on Turkish history and current examples.				

The historical evidence, local and oral history in social studies instruction course content was compared with social studies course objectives in different grades and presented in Table 8. It was determined that the course content included 3 fourth grade objectives, 2 fifth grade objectives, 3 sixth grade objectives and 1 seventh grade objective. Thus, the course content included 9 objectives course objectives. Two sample objectives are presented in Table 8.

Table 9: Comparison of information technologies in social studies instruction course content and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Information technologies in social studies instruction	3 objectives	3 objectives	1 objective	2 objectives	9 objectives
Sample Objectives	SS.5.4.2. Questions the accuracy and reliability of the data accessed in virtual media. SS.5.4.3. Complies with security rules on virtual media.				

The social studies course curricula objectives for different grades included in the information technologies in social studies instruction course content are presented in Table 9. It was observed that the course content included 3 fourth and fifth grade objectives, 1 sixth grade objective, and 2 seventh grade objectives. Thus, 9 objectives were included in the course content. Two objective examples are presented in Table 9.

Table 10: Comparison of Turkish judicial system course content and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Turkish judicial system	4 objectives	8 objectives	7 objectives	5 objectives	24 objectives
Sample Objectives	SS.6.5.4. Defends the necessity and significance of taxation in national economy as a citizenship responsibility. SS.7.6.4. Analyzes the problems encountered in the implementation of democracy.				

The social studies course curricula objectives for different grades included in the Turkish judicial system course content are presented in Table 10. It was determined that the course content included 4 fourth grade objectives, 8

fifth grade objectives, 7 sixth grade objectives, and 5 seventh grade objectives. The course content was associated with 24 objectives. The Turkish judicial system course was the most associated course with the curricula objectives. Two objective examples are presented in Table 10.

Table 11: Comparison of Turkish economy course content and social studies curriculum objectives by grade level.

Course	4th grade	5th grade	6th grade	7th grade	Total
Turkish economy	2 objectives	7 objectives	8 objectives	4 objectives	21 objectives
Sample Objectives	SS.6.5.1. Associates natural resources and economic activities. SS.7.5.2. Analyzes the effects of developments in production technology on social and economic life.				

The social studies course curricula objectives for different grades included in the Turkish economy course content are presented in Table 11. The course content included 2 fourth grade objectives, 7 fifth grade objectives, 8 sixth grade objectives and 4 seventh grade objectives. Thus, the course content was associated 21 social studies curriculum objectives. Furthermore, it was determined that the second grade course included the most number of objectives. Two of these objectives are presented in Table 11.

Table 12: The learning area and related objectives in elective field courses.

Learning area	Objectives	Course and objectives
Individual and society	7	<ul style="list-style-type: none"> Information Technologies in SSI (1) Historical Evidence, Local and Oral History in SSI (5)
Culture and heritage	7	<ul style="list-style-type: none"> Maps and mapping applications (1) Material Design in SSI (1) Historical Evidence, Local and Oral History in SSI (5) Regional Children's Games in SSI (1)
People, places, and environments	18	<ul style="list-style-type: none"> Environmental Education (8) Current Global Issues (1) Maps and mapping applications (7) Information Technologies in SSI (1) Turkish Economy (1)
Science, technology, and society	11	<ul style="list-style-type: none"> Environmental Education (1) Historical Evidence, Local and Oral History in SSI (1) Turkish Judicial System (3) Information Technologies in SSI (6)
Production, distribution and consumption	18	<ul style="list-style-type: none"> Environmental Education (1) Information Technologies in SSI (1) Turkish Judicial System (3) Turkish Economy (13)

Active citizenship	13	<ul style="list-style-type: none"> ● Historical Evidence, Local and Oral History in SSI ● (1) Turkish Judicial System (12)
Global connections	24	<ul style="list-style-type: none"> ● Current Global Issues (1) ● Regional Children's Games in SSI (1) ● Material Design in SSI (1) ● Globalization and Society (15) Turkish Economy (6)

The objectives included in elective course content and associated learning areas in the social studies curricula are presented in Table 12. It was observed that the individual and society learning area was mostly represented in the Turkish judicial system course objectives. Also, information technologies in social studies and historical evidence, local and oral history in social studies instruction course objectives were associated.

The culture and heritage learning area was mostly associated with the historical evidence, local and oral history in social studies course. Furthermore, the learning area was associated with maps and mapping applications, material design in social studies instruction, and regional children's games in social studies instruction courses.

The people, places and environments learning area was associated with 18 objectives. Out of these objectives, 8 was associated with the environmental education course, and 7 were associated with the maps and mapping applications course. The rest were associated with the current global issues, information technologies and Turkish economy courses.

The science, technology and society learning area was associated with 11 objectives. The information technologies in social studies course included 6 objectives, followed by the Turkish judicial system course with 3 objectives. Also, environmental education and historical evidence, local and oral history in social studies instruction courses were associated with the remaining objectives.

The production, distribution and consumption learning area was associated with 18 objectives. It was determined that the most of these objectives were included in the Turkish economy course content, followed by the Turkish judicial system (3 learning objectives), information technologies in social studies and environmental education courses.

Thirteen objectives were associated with the active citizenship learning area. Twelve were included in Turkish judicial system course, and one was included in the historical evidence, local and oral history in social studies instruction course.

The global connections learning area in the curriculum was associated with 24 objectives. Fifteen objectives were included in the globalization and society course, following by the Turkish economy course (6 objectives), current global issues, regional children's games in social studies instruction and material design in social studies instruction courses.

4. Conclusion, Discussion and Recommendations

Similar to the teacher training programs in various countries such as Germany, the Netherlands, Singapore, and Romania, elective courses are included in the teacher training programs in Turkey (Baskan, et al., 2006; Bilici & Bedirhanoglu, 2020; Ergun & Ersoy, 2014; Kuzu, 2009; Yazçayır and Yıldırım, 2021). Certain goals, expectations, global changes, competencies in the relevant field, and curricula could be effective in the determination of the elective course content. Comparison of the course content in teacher training programs and various phenomena (e.g., the curricula) associated with this content could help understand the scope and significance of the content. The same could be applied to the undergraduate social studies instruction program.

In the current study, where the elective course content detailed in the 2018 social studies teacher training program were compared to the 2018 social studies curricula, certain findings were determined. The analysis of the 2018 curricula objective based on the course content revealed that the "Turkish judicial system" course included the most objectives. In other words, the "Turkish judicial system" course was associated with a higher number of objectives when compared to other elective field courses, suggesting that the "Turkish judicial system" course included more than one curricular learning area (individual and society, active citizenship, etc.). Although the "Turkish judicial system" course was associated with higher number of curricular objectives in the study, Bursa and Ersoy (2020) reported that the pre-service social studies teachers considered this course as the most unnecessary elective course. Although the Turkish judicial system course was associated with the highest number of curricular objectives, the fact that the course content was considered as the most unnecessary course by the pre-service social studies teachers could be associated with the similarities between the course content and that of other compulsory courses (e.g., Human Rights and Democracy Education and Citizenship). The "Turkish economy" course was also associated with a higher number of objectives in the 2018 curricula when compared to other elective courses. The "Turkish economy" course was mostly associated with 6th grade objectives, and it was associated with the 4th grade objectives the least. Kınacı (2021) reported that the 5th, 6th and 7th grade objectives were the least associated with history and geography disciplines. Considering the content of the above-mentioned elective courses, it could be suggested that these courses could be included in other social science disciplines (economics and law), and the above-mentioned study findings were consistent.

A significant finding in the study was the low number of curricular objectives that were associated with certain elective field courses. These elective courses were the current global issues, regional children's games in social studies instruction, and material design in social studies instruction. It has been determined that these elective courses were directly associated with 2 objectives in 2018 curricula for various grades. The current global issues course included one 4th grade and 7th grade objective, the regional children's games in social studies instruction and material design in social studies instruction courses included 2 4th grade objectives.

It was also determined in the study that certain elective field course content was not associated with any curricular objective. One of these courses was the "evaluation of in-classroom learning". The revision of the teacher training program by Council of Higher Education included the reasons for the revision, the innovations, and the principles of practice introduced in the Regulations for Field Education Courses sub-section. It was stated that the elective course "evaluation of in-classroom learning" was introduced by the curriculum within the context of the practice examples that were included in all curricula to provide a standard for the in-class evaluations and the adequate employment of student assessments in the transition to a higher education level in the future (URL-1). The fact that this course was included in all curricula could have paved the way for the disassociation of course with the social studies curriculum objectives. Similarly, the information on the "Social Studies Textbook Review" course stated that the course was introduced to all curricula and the name of the course will be substituted by the name of the relevant discipline to allow the pre-service teachers to choose quality textbooks (URL-1), demonstrating that this course aimed at the professional development of pre-service teachers. Thus, the "Social Studies Textbook Review" course was not directly associated with any social studies curriculum objective. The final course, which was not directly associated with any social studies curriculum objective, was the Drama in Social Studies Instruction. The analysis of the course content revealed that the course also prioritized the professional development of pre-service teachers, and thus, it was not directly associated with any objective.

The analysis of the elective field courses in the 2018 Social Studies Teacher Training Program demonstrated that the highest number of objectives were observed in the 4th grade curriculum, followed by the 5th and 6th grade curricula with the same number of objectives, and the 7th grade curriculum. In other words, the elective field course content was associated with 29 4th grade objectives, 28 5th and 6th grade objectives, 17 7th grade objectives, and 17 objectives in total in the 2018 Social Studies Teacher Training Program. Thus, it could be suggested that the associations between course content and the curricula were consistent across the 4th, 5th and 6th grades, but lower in the 7th grade.

5. Recommendations

In the study, it was determined that certain course content was only associated with the 4th grade objectives. The learning objectives could be improved to include the objectives specified in other grade curricula. Furthermore, during the revision of teacher training programs, the curriculum content should be based on the grade of the courses that would also be instructed by the pre-service teachers. Social studies courses are instructed in the 5th, 6th and 7th grades. Thus, the relevant content for the associated grade (e.g. objectives, values, skills) should be taken into account in the content development for teacher training programs.

It was determined that certain elective field courses in the Social Studies Teacher Training Program were especially aimed the professional development of pre-service teachers, therefore, certain course content was not directly associated with the curricular objectives. Thus, certain courses such as "Drama in Social Studies Instruction", "Evaluation of In-Classroom Learning" and "Social Studies Textbook Review" that focus on professional development should be instructed in senior classes, especially after certain basic courses (i.e., Social Studies Curricula). Then, the knowledge and skills acquired in the course could be integrated into the field more effectively.

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Difficulties, Benefits and Recommendations of Mainstreaming Practices

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Abstract

This research was conducted in order to uncover the challenges and benefits experienced by and recommendations of the families whose children with special needs continued mainstreaming practices for at least five years. This is a qualitative case study. The research was conducted by in-depth interviews with thirty-three families. As a result of research, it has been determined that the families experienced difficulties collaborating with executives, mainstreaming students with their teachers, providing sufficient information to the student, about negative attitudes and behaviors, exclusion and bullying from students with normal development, self-confidence, learning problems, behavior problems and obsessions from children with special needs, and the lack of acceptance of the children within the family. In the study, the mainstreaming practices have been determined to be beneficial for executives to understand individual differences, for teachers to understand the different learning styles, tolerance and being patient, for students with normal development to ensure self-confidence, socializing, communication and fitting into society, and for families to develop appropriate attitudes for their children and monitor the development areas where the children are sufficient and insufficient. It has been observed that the families recommended the executives to be cooperate with executives, support students who are successful at mainstreaming with teachers, be understanding and attentive, include students with normal development in games and activities, be tolerant, support the students with special needs in their social skills and self-confidence development, and families to cooperate, be open to communication, and promote their practices.

Keywords: Mainstreaming, Family, Difficulties, Benefits, Suggestions

1. Introduction

Law for Children in Need of Special Education numbered 2916 (1983) and Decree numbered 573 (1997) within the legislative framework integration applications In Turkey are applied in line with the "Special Education Services Regulation (2018)" which is renewed and published every couple of years. Having been applied for nearly forty years in Turkey, the mainstreaming practices are defined as "full-time education provided for individuals with special educational needs alongside their peers while receiving support services or part-time in special education classes so that they can interact with all sorts and ranks of individuals and ensure that they achieve their educational goals as much as possible (MEB, 2018)." In mainstreaming practices, as stated in the definition,

children with special needs are educated by providing support education services alongside their peers who are developing normally.

Families of children with special needs have a prominent place in mainstreaming practices. That is because they are a crucial factor, for the cooperation between school administration and teachers in and successful execution of mainstreaming practices. In addition, families are the ones who have information about a child with special needs, share it with teachers when necessary, and support the child's achievements in school at home and in other settings. Besides, the acceptance and adaptation of families with the child, the support they provide in the education and development of the child, and the natural role of educators in giving the child the desired behaviors are important in mainstreaming practices. On the other hand, reasons such as the legal rights in the implementation of mainstreaming practices make families an important part of the integration practices (Gulec Aslan, 2016; Keceli-Kaysili, 2008; Pistav Akmese and Kayhan, 2014; Yildiz, 2017).

Both in many countries of the world and in Turkey, the participation of families in mainstreaming practices is guaranteed by law. Moreover, it is possible to come across many studies on families in the literature on mainstreaming practices. In this section, several example studies have been given as example of research conducted with families on mainstreaming in the national and international literature in recent years. As per these studies, Unal and Iflazoglu Saban (2014) investigated the attitudes of the families of disabled students (who continue the mainstreaming practices) towards mainstreaming. They have found that, in general, families have a positive attitude and that the majority of them are satisfied with the mainstreaming education their children receive. Tryfon et al. (2019) investigated the perspectives of parents towards mainstreaming education. They have observed that the majority of families want their children to participate in mainstreaming activities with their peers, that these activities develop their children's social skills, but that there is a low level of cooperation with the teachers. Cifci Tekinarslan et al. (2018) have determined in their studies to determine the needs of the parents of students receiving mainstreaming education that parents need social support, information, assistance and adaptation. Hanssen and Erina (2021) investigated the families' insights towards mainstreaming education for children with special educational needs. They stated that many families believe the degree of collaboration with teachers is limited and the teachers do not possess the knowledge and experience for working with students with special needs. Yazici and Durmusoglu (2017) investigated the problems and expectations of families with a child with special needs, in which they have found out that the individuals in the community feel pity for, do not understand, and present perplexity towards children with special needs, that they face architectural and educational problems, and that they have expectations from teachers, executives, local governments and civil society organizations regarding these issues. Looking at these studies conducted in the literature, it has been seen that families have different thoughts, opinions, satisfaction levels, difficulties and expectations regarding mainstreaming practices.

It is possible to encounter different difficulties in terms of families, teachers, students and executives in mainstreaming practices. Examining the studies in the literature conducted for determining the difficulties encountered by the teachers, it can be observed that the teachers face problems taking care of and making time for their mainstreaming students and that the mainstreaming students face educational and behavioral issues (Akalin, 2015; Deniz and Ilik 2021; Pijl et al., 2008; Rakap et al., 2010; Sarac and Colak, 2012). Some studies also emphasize teacher inadequacies regarding the difficulties encountered in mainstreaming practices (Hanssen and Erina, 2021). Similarly, Unal and Iflazoglu Saban (2014) have found that teachers in mainstreaming classes are lacking in terms of knowledge about mainstreaming and special education, do not have sufficient experience, and are unable to allocate enough time to mainstreaming. The results of some research have also indicated that teachers have negative attitudes about mainstreaming practices (Rakap and Kaczmarak, 2010; Saloviita, 2018). Paseka and Schwab (2019) have found that, in terms of mainstreaming practices, the families have a quite positive attitude towards mainstreaming a student with physical or learning disability, and a neutral attitude towards mainstreaming a student with behavioral disorder or mental disorder. This finding is similar to the results of previous research conducted in the field (Leyser and Kirk, 2004; Tafa and Manolitsis, 2003). In another study, Aktan et al. (2019) investigated the level of social acceptance of primary school students towards mainstreaming students, and they have discovered that mainstreaming students are being perceived as problematic in terms of academic and social aspects and are not socially accepted by their peers, and that it is necessary to improve teachers' competence levels and inform the students and families in order to increase the social acceptance towards individuals with special needs. Similarly, many studies have revealed that the children with special needs in mainstreaming practices face

social adaptation problems, loneliness, peer rejection, and poor peer relationships (Chamberlain et al., 2007; Kabasakal et al., 2008). In another survey, Yilmaz and Batu (2016) have pointed out the issues of insufficiently informing people in mainstreaming practices, parents not accepting their children's special status, and students with normal development having negative attitudes toward students with special needs. As can be seen from the research examples given above, various difficulties can be encountered in mainstreaming applications.

Many research results from around the world mention the countless benefits of mainstreaming practices. Researchers have stated that students with special needs are more successful, have improved social skills through mainstreaming practices, and provide benefits for students with normal development as well (Tryfon et al., 2019; Bakaloglu et al., 2018). It has been observed that students with normal development, female students (social and communication skills of whom the students with special needs improved) (Downing and Peckham-Hardin, 2007), and students who previously contacted students with disabilities are more positive (Dellanna et al., 2019). Additionally, it has been shown that skills have been achieved such as tolerance, cooperation, respect for differences, and seeing their own inadequacies and accepting towards children with special needs through mainstreaming (Arslan and Altintas, 2014; Sharma and Mahapatra, 2007). It has been observed that the inappropriate behavior rate of the children with special needs decreased and their learning rates, friendships and social development improved because of the mainstreaming practices (Sharma and Mahapatra, 2007), and that the research about the benefits of mainstreaming in the literature focused more on students with special needs students with normal development, there are less research studies on parents and teachers, and the number of research studies on the executives is limited.

It is possible to come across various recommendations regarding mainstreaming practices in the literature. According to Falkmer et al. (2015), teachers can be both the main facilitators and barriers to mainstreaming practices. Teachers should get to know students well and try to improve their social relationships. Additionally, teachers, other employees and families should cooperate. In some studies conducted on the solution of the problems encountered in mainstreaming practices, it is stated that it is necessary to reduce classroom capacities, and include physical, instructional and behavioral arrangements in schools and classrooms. In addition to these, it has been recommended to conduct studies in order to inform all stakeholders of mainstreaming practices, increase support trainings, support the positive behaviors of mainstreaming students, improve the cooperation between all school staff, students and families, and ensure that students with normal development have more positive behaviors and attitudes towards students with special needs (Yilmaz and Batu, 2016).

This research is limited to the families of a total of thirty-three students with learning disabilities, mental impairment, physical impairment, autism spectrum disorder, and attention deficit and hyperactivity disorder who practice mainstreaming. Compared to other research conducted in the research area, it differs from other research in some obvious respects. The first of these differences is that the research was conducted with families who have been involved in mainstreaming their child with special needs for at least five years. The second is that there are no studies on the difficulties faced by, benefits for and recommendations of families regarding executives, teachers, students with normal development, and the children with special needs and their families. It is expected that the research is significant in these aspects and will contribute to the field.

The main goal of this research is to uncover the challenges and benefits experienced by and recommendations of the families whose children with special needs continued mainstreaming practices for at least five years. Therefore, the parents were given questions to discover the challenges they faced, the benefits of mainstreaming practices and their recommendations about mainstreaming practices regarding the executives, teachers, students with development, children with special needs and their families.

2. Method

This is a qualitative case study. Yildirim and Simsek (2013:45) define qualitative research as research in which qualitative data collection methods such as interviews, observations and document analysis are used, and a qualitative process is followed to present perceptions and events in a realistic and holistic manner in the natural environment. The main case is principal, and it is aimed to reach the truth about the situation in qualitative research. There are three types of data collection methods widely used in qualitative research. These are interviews,

observations and written document analysis (Yildirim and Simsek, 2013:46). The "interview technique" was used to obtain the qualitative data for this research. The interviews were conducted using a semi-structured interview form, the content of which was developed by the researchers.

2.1 Identify Subsections

The research was conducted on a total of 33 people, 21 mothers and 12 fathers, who have continued the mainstreaming practices of their child with special needs for at least five years in Kayseri provincial center in Turkey in 2022. The participants were determined by purposeful sampling method. The ages of the children with special needs range from 14 to 19. The diagnoses of the children with special needs in the study are given in Table 1.

Table 1: The diagnoses of the children

Diagnosis	Number
Special Learning Difficulties	11
Mental Incompetency	9
Physical Incompetency	5
Attention Deficit Hyperactivity Disorder	4
Autism Spectrum Disorder	4
Total	33

When Table 1 is examined, it is seen that among the children in the study who attended mainstreaming practices, 11 were diagnosed with special learning disabilities, 9 with mental incompetencies, 5 with physical incompetencies, 4 with attention deficit and hyperactivity disorder, and 4 with autism.

2.2 Data Collection Tool

The data for the study were collected by semi-structured interview technique, a qualitative research method. Primarily, the researchers have prepared questions related to the subject to be investigated. The first section includes demographic information about the participants, whereas the second part focuses on the difficulties they face in mainstreaming practices, their benefits and recommendations. The researchers also consulted two Turkish Lecture teachers and two measurement and evaluation experts to determine whether the questions were easy and expressed clearly. Additions and subtractions were made in the interview form in accordance with the opinions received from experts. Afterwards, the questions in the semi-structured interview form were submitted to the two families and a preliminary interview was conducted. In line with the opinions received from the families, the interview form has been reorganized by making changes in the content and places of some questions.

The questions in the semi-structured interview form are given below.

- 1) **What are the difficulties you face in mainstreaming practices?**
 - a) What are the difficulties regarding executives?
 - b) What are the difficulties regarding teachers?
 - c) What are the difficulties regarding peers with normal development?
 - d) What are the difficulties regarding your child with special needs?
 - e) What are the difficulties regarding your family?
- 2) **What are the benefits about mainstreaming practices?**
 - a) What are the benefits about executives?
 - b) What are the benefits about teachers?
 - c) What are the benefits about peers with normal development?
 - d) What are the benefits about your child with special needs?
 - e) What are the benefits about your family?
- 3) **What are your recommendations about mainstreaming practices?**
 - a) What are your recommendations about executives?
 - b) What are your recommendations about teachers?

- c) What are your recommendations about peers with normal development?
- d) What are your recommendations about your child with special needs?
- e) What are your recommendations about families of children with special needs?

2.3 Data Collection

The researchers first reached out to parents who brought their children to special education and rehabilitation centers in Kayseri, Turkey. The families were informed about the research, and it was explained to the families that the children with special needs who will participate in the research should have been in mainstreaming practices for at least five years. In the research, it was explained secondly to the families that this is voluntary research, meaning that the research will consist of families who want to participate voluntarily. A total of thirty-seven volunteer families participated in the research. Since the answers given by the four families were found to be superficial, these participants were not included in the study by the researchers. In the process of data collection, face-to-face interviews were conducted with the families. The interviews were conducted in a quiet environment and each interview lasted between 17 and 28 minutes.

3. Findings

This section elaborates the findings in the tables below which include the difficulties faced by, benefits for and recommendations of families regarding executives, teachers, students with normal development, and the children with special needs and their families.

Table 2: Difficulties regarding the executives in mainstreaming practices

Difficulties	f
Lack of communication and cooperation with Counselling and Research Centers	6
Lack of communication and cooperation with Special Education and Rehabilitation Centers	4
Lack of knowledge about the terms related to special education	4

Table 2 shows the difficulties that families encounter with executives in mainstreaming practices. As observed in the table, it was found that families (13) have difficulties about cooperation with executives and other institutions, as well as about the terms of special education.

Table 3: Difficulties regarding the teachers in mainstreaming practices

Difficulties	f
Lack of information about the mainstreaming student	3
Failure to schedule and plan	2
Negative attitudes and behaviors	2
Reluctance towards mainstreaming students	2

It can be observed in Table 3 that among the difficulties the families (9) face regarding the teachers in mainstreaming practices are lack of information about the mainstreaming student, failure to schedule and plan, negative attitudes and behaviors, and reluctance towards mainstreaming students.

Table 4: Difficulties regarding the students with normal development in mainstreaming practices

Difficulties	f
Making fun of their academic failures	9
Exclusion	8
Peer bullying	7

Table 4 shows the difficulties that families (24) face with students who show normal development in mainstreaming practices. Families believe the difficulties they face are students with normal development making fun of the academic failures of mainstreaming students, excluding them in and out of the classroom, and peer bullying.

Table 5: Difficulties regarding the students with special needs in mainstreaming practices

Difficulties	f
Lack of self-confidence	9
Learning problems	6
Disagreements with peers	6
Problems of adaptation to class and school	5
Problematic behaviors	4
Obsessions	3

The difficulties faced by families regarding the students with special needs in mainstreaming practices are given in Table 5. It has been found that the most common difficulties experienced by families (33) regarding their children with special needs, in order, are lack of self-confidence, learning problems, disagreements with peers, problems of adaptation to class and school, problematic behaviors, and obsessions.

Table 6: Difficulties regarding the families in mainstreaming practices

Difficulties	f
Inability to accept the inadequacy of the child	7
Inability to devote time to a child with normal development	6

Table 6 shows the difficulties faced by families regarding the families in mainstreaming practices. It has been found that families (13) have difficulty in accepting the inadequacy of their children and devoting time to their child with normal development.

Table 7: Benefits of mainstreaming practices regarding the executives

Benefits	f
Communication skills with family and teachers	6
Understanding individual differences	5

Looking at the benefits of mainstreaming practices regarding the executives in Table 7, it can be observed that some of the families (11) find mainstreaming practices to be beneficial for the development of communicational skills between families and teachers, and for the ability to understand individual differences.

Table 8: Benefits of mainstreaming practices regarding the teachers

Benefits	f
Understanding individual differences	12
Knowledge about different learning styles	10
Developing and planning programs for special children	6
Tolerance, respect and patience	5

According to Table 8, it is seen that mainstreaming practices have many benefits for teachers. It has been found that benefits regarding the teachers include understanding individual differences, having knowledge about different learning styles, developing and planning programs for children with special needs, as well as tolerance, respect and patience, according to the families (33).

Table 9: Benefits of mainstreaming practices regarding the students with normal development

Benefits	f
Understanding individual differences	9
Developing the senses of help and sharing	8
Accepting individual differences	7
Developing compassion	5
Ability to empathize	4

According to the families (33), mainstreaming practices have many benefits for students with normal development, as presented in Table 9. It has been found that students with normal development contribute to the ability to understand individual differences, develop senses of helping and sharing, accept individual differences, and develop compassion and ability to empathize.

Table 10: Benefits of mainstreaming practices regarding the students with special needs

Benefits	f
Supporting their self-confidence in a positive way	5
Socialization	5
Being happy among peers	4
Imitating children with normal development	4
The possibility of receiving support training outside the classroom	4
Ability to work collaboratively	4
Advances in cognitive, motor, language and social development	4
Adapting to the society	3

Table 10 shows the benefits of mainstreaming practices for students with special needs. According to the families (33), mainstreaming practices were found to be beneficial for students with special needs in terms of supporting their self-confidence in a positive way, socialization, being happy among peers, imitating children with normal development, the possibility of receiving support training outside the classroom, ability to work collaboratively, advances in cognitive, motor, language and social development, and adapting to the society.

Table 11: Benefits of mainstreaming practices regarding the families

Benefits	f
Being happy as the child succeeds more	10
More positive attitudes towards the child as the child succeeds more	9
Being satisfied about their child receiving education in the same environment as their peers	9
Ability to observe the areas of development where the child is adequate and inadequate	5

Table 11 shows the benefits of mainstreaming practices regarding the families as their children continue mainstreaming practices. It has been discovered that families (33) find opportunities to be happy as the child succeeds more, act more positive attitudes towards the child as the child succeeds more, be satisfied about their child receiving education in the same environment as their peers, and have the ability to observe the areas of development where the child is adequate and inadequate.

Table 12: Recommendations regarding the executives in mainstreaming practices

Recommendations	f
Cooperation with private educational institutions and organizations should be increased	6
There should be more activities among students	6
They should be interested in and supportive to mainstreaming students	5

The recommendations of the families regarding the executives in the mainstreaming practices are given in Table 12. It can be observed that families (17) recommended executives to advance the cooperation with special educational institutions and organizations, include more activities among students, and be interested in and support mainstreaming students.

Table 13: Recommendations regarding the teachers in mainstreaming practices

Recommendations	f
Supporting the successful aspects of mainstreaming students and paying attention to them in the classroom	8
Providing information about mainstreaming students to their peers in the classroom	7
Receiving more education and information about children with special needs	7
Being understanding and caring	6

Devoting a little more time to the adaptation of mainstreaming students	3
-------------------------------------------------------------------------	---

Table 13 shows the recommendations of families about teachers in mainstreaming practices. According to families (31), the teachers should support the successful aspects of mainstreaming students and paying attention to them in the classroom, provide information about mainstreaming students to their peers in the classroom, receive more education and information about children with special needs, be understanding and caring, and devote a little more time to the adaptation of mainstreaming students.

Table 14. Recommendations regarding the students with normal development in mainstreaming practices

Recommendations	f
Being sensitive to students with special needs	12
Mainstreaming them in group games and activities	10
Being respectful, patient and tolerant	6
Learning about students with special needs	5

Table 14 shows the recommendations of families regarding students with normal development in mainstreaming practices. It has been observed that, in terms of mainstreaming practices, families (33) recommended students with normal development about being sensitive to students with special needs, mainstreaming them in group games and activities, being respectful, patient and tolerant, and learning about students with special needs.

Table 15. Recommendations regarding the students with special needs in mainstreaming practices

Recommendations	F
Preparing appropriate programs for themselves and receiving appropriate trainings for these programs	8
Social skills should be improved	6
Self-confidence development should be supported	6

The recommendations of the families regarding the students with special needs in the mainstreaming practices are given in Table 15. It has been discovered that, in terms of mainstreaming practices, families (20) recommended preparing appropriate programs for students with special needs and receiving appropriate trainings for these programs, and that their social skills should be improved, and self-confidence development should be supported.

Table 16. Recommendations regarding the families in mainstreaming practices

Recommendations	f
They need to know their children in every way	6
Supporting their children in every field such as education, sports, music	5
They should value mainstreaming students and make them feel that value	4
Being attentive and investigative for mainstreaming students	4
Being open to cooperation and communication with executives and teachers	4
Being patient	4
Supporting their children and peers to adapt	3
They should encourage mainstreaming practices	3

Table 16 shows the recommendations of families regarding other families whose children attend mainstreaming practices. It has been seen that families (33), in terms of mainstreaming practices, presented their recommendations, in order, about the need to know their children in every way, supporting their children in every field such as education, sports, music, valuing mainstreaming students and make them feel that value, being the researchers for mainstreaming students, being open to cooperation and communication with executives and teachers, being patient, supporting their children and peers to adapt, and encouraging mainstreaming practices.

4. Discussion

This section discusses the findings, difficulties encountered in mainstreaming practices, their benefits and recommendations in comparison with the field literature.

Difficulties

It was determined that the families participating in this research encountered difficulties in mainstreaming practices in the sense that teachers had insufficient knowledge about the mainstreaming student, negative attitudes and behaviors, and unwillingness. The results of this research have been observed to be compatible with those of some other studies regarding the negative attitudes and unwillingness of teachers towards mainstreaming practices (Rakap and Kaczmarak, 2010; Saloviita, 2018) and information deficiencies (Hanssen and Erina, 2021).

Parents have stated that mainstreaming students have difficulties in matters such as being excluded, peer bullying, and their academic failures being mocked by students with normal development. This finding is similar to the results of the studies by Yazici and Durmusoglu (2017), who investigated the problems and expectations of families in the literature and who have found out that individuals in the society are inconsiderate towards children with special needs, and those of Aktan et al. (2019) who investigated the social acceptance level of primary school students towards mainstreaming students, which discovered that the mainstreaming students are being perceived as academically and socially problematic, socially rejected by their peers, and face difficulties during mainstreaming practices such as social adaptability issues, loneliness and peer rejection (Baydik and Bakkaloglu, 2009; Chamberlain et al., 2007; Kabasakal et al., 2008).

In the research, families mentioned learning problems, lack of self-confidence, adaptation problems, problematic behaviors and obsessions as the difficulties they had with their children with special needs. Some studies show that students with learning problems have lower self-esteem than those without, and this negatively affects their self-confidence (Al Zyoudi, 2010). In these research findings, parents often emphasized a similar point for their children in mainstreaming practices and stated that their children have learning problems and lack of self-confidence. It can be said that this finding supports the view which suggests that students with special needs have low self-esteem compared to their peers. It can also be observed that the results of this research are similar with those of other research which have found out that problematic behaviors and obsessions of students with special needs pose a problem in mainstreaming practices (Akalin, 2015; Deniz and Ilik 2021; Pijl et al., 2008; Rakap and Kaczmarak, 2010; Sarac and Colak, 2012).

The families expressed their inability to accept the inadequacy of their children among the difficulties they experienced about themselves. The research results present the existence of the issue that families of children with special needs have difficulty accepting their children's situations (Yilmaz and Batu, 2016). It is a frequently encountered situation that the research results show similarity at this point. However, the fact that the issue of non-acceptance of families is prolonged in terms of time and, in particular, delaying the education of children can lead to greater losses. It should be noted that families should be careful in this regard.

Benefits

In the findings of this research, it has been concluded that mainstreaming practices are useful for administrators, teachers and students exhibiting normal development to understand individual differences. Similarly, in other research results (Arslan and Altintas, 2014; Sharma and Mahapatra, 2007), this finding has been observed quite commonly. These results suggest that mainstreaming practices help to understand individual differences in most people.

Students with special needs interact with a wider range of students with various abilities in mainstreaming practices. Mainstreaming practices help all students get opportunities to improve their communication skills. Therefore, students with special needs will have opportunities to gain experience, strengthen communication skills and adapt to various levels of social interaction. In this research, it has also been found that mainstreaming practices positively support the communication skills of children with special needs in particular. This finding supports other studies conducted in the field (Downing and Peckham-Hardin, 2007). In the research, it can be said that students with special needs are the ones who benefit the most from the mainstreaming practices. It has been determined that mainstreaming practices benefit students with special needs in many ways, such as supporting their self-confidence, socialization, communication, imitation, cognitive and motor development, and adapting to

the society they live in. This finding seems to be consistent with most research results conducted in the field (Bakkaloglu et al., 2018; Downing and Peckham-Hardin, 2007; Gok and Erbas, 2011; Tryfon et al., 2019). These results show that mainstreaming practices have great benefits for special needs students, and it seems that more special needs students will participate in mainstreaming practices in the future.

It is known that in their families, they have benefited significantly from mainstreaming practices. The results have shown that families provide benefits in terms of developing positive attitudes towards the child, happiness brought about by being together with their peers, and being able to observe the areas of development where their children are adequate and inadequate in mainstreaming practices. These findings are similar to the research results in the literature (Unal and Iflazoglu Saban, 2014; Tryfon et al., 2019).

Recommendations

Parents, teachers and administrators should know that students need to work together and develop successful communication skills. In the research findings, it was determined that cooperation is important, and it is recommended to the families of children with special needs to continue mainstreaming practices. Families, administrators and teachers have a significant impact on children's school lives according to Paccaud et al. (2021). Therefore, cooperation between them is a crucial factor in the education of children. With cooperation, it has positive effects on children's learning skills, motivation and mental health. In addition, cooperation provides support in both academic and emotional terms. It has been observed that the cooperation deficiencies noted in the research results in the field literature (Falkmer et al., 2015; Gok and Erbas, 2011; Hanssen and Erina, 2021; Tryfon et al., 2019) and the recommendations of the families participating in this research on cooperation with each other. In the literature, some researchers have stated that teachers lack the necessary knowledge and experience to work with students with special needs (Hanssen and Erina, 2021; Unal and Iflazoglu Saban, 2014; Gok and Erbas, 2011). One of the recommendations made by the parents for teachers in this research was related to the lack of education and knowledge about children with special needs. This result is similar to the research findings made in the literature. Teachers who have mainstreaming students in their class can at least get information about this student, know their needs, and how they can better benefit from mainstreaming practices by being exploratory about their issues, which can make families happier.

It has been found that parents recommended students with normal development to treat students with special needs with respect and tolerance, include them in their games and activities, and be more sensitive. It has been seen that these recommendations of families about children with normal development are consistent with the findings and recommendations of some researchers (Aktan et al., 2019; Chamberlain et al., 2007; Kabasakal et al., 2008; Yilmaz and Batu, 2016). Providing information and support to students with normal development by administrators and teachers about mainstreaming practices and their students can enable students to avoid negative attitudes and behaviors. Moreover, joint activities and assignments can enable students to connect with each other.

The families recommended on issues such as preparing a program for students with special needs in mainstreaming practices that are appropriate for their own development, educating them, and improving their social skills and self-confidence. It has been observed that these recommendations improved social and communicational skills of students with special needs in mainstreaming practices, mitigated problematic behaviors, increased learning rates and friendships, and were compatible with previous research in the literature (Bakkaloglu et al., 2018; Downing and Peckham-Hardin, 2007; Sharma and Mahapatra, 2007; Tryfon et al., 2019). These wishes of the families regarding the students with special needs in the mainstreaming practices can be accepted as an indication that they have positive expectations from the mainstreaming practices.

The difficulties encountered with executives in the field of mainstreaming practices, the benefits of executives and the limited number of studies containing recommendations about executives have attracted the attention of the researchers during the research process. Another detail that draws attention in this research is that the families express fewer opinions in terms of the difficulties they face in mainstreaming practices, but more opinions in terms of benefits and recommendations. The researchers interpreted the participation of families in terms of the number of questions about the benefits and recommendations of mainstreaming as an indication that they are satisfied with the mainstreaming practices in Turkey.

5. Conclusion and Recommendations

This research was conducted in order to uncover the challenges experienced by the families whose children with special needs continued mainstreaming practices for at least five years regarding executives, teachers, students with normal development, and students with special needs and their families; the benefits of mainstreaming practices, and recommendations regarding the executives, teachers, students with normal development, and students with special needs and their families.

It has been concluded that the families experienced difficulties about cooperation with executives and other institutions, and the terms of special education; and that the teachers lacked information about mainstreaming students, do not prepare programs and plans, and have reluctance towards mainstreaming students with their negative attitudes towards mainstreaming students. In addition, it has been observed that mainstreaming students had difficulties with students with normal development who made fun of their academic failures, excluded and bullied them; and that the difficulties were the cause of lack of self-confidence, learning problems, disagreements with peers, problems of adaptation to class and school, problematic behaviors, and obsessions. The results revealed that the difficulties experienced by families about themselves are related to the inability to accept the inadequacy of their children and to devote time to their child, who is developing normally.

It has been concluded in the research that the benefits of the mainstreaming practices regarding the executives helped develop the communicational skills between the families and the teachers, and improve the ability to understand individual differences; helped the teachers understand individual differences and gather information about different learning styles; and helped the children with special needs prepare programs and plans, and be tolerant, respectful and patient. Families have been found to believe that students with normal development contribute to the ability to understand individual differences, develop senses of helping and sharing, accept individual differences, and develop compassion and ability to empathize. Mainstreaming practices have been determined to be beneficial for students with special needs in terms of supporting their self-confidence in a positive way, socialization, being happy among peers, imitating children with normal development, receiving support training outside the classroom, ability to work collaboratively, advances in cognitive, motor, language and social development, and adapting to the society. In addition, it has been observed that the families have benefitted from the mainstreaming practices since they were happy about their children's success, developed positive attitudes towards their children, satisfied that they were attending school alongside their peers, and was able to monitor adequate and inadequate development areas of their children.

Families recommended executives to advance the cooperation with special educational institutions and organizations, include more activities among students, and be interested in and support mainstreaming students. They have also recommended the teachers to support the successful aspects of mainstreaming students and pay attention to them in the classroom, provide information about mainstreaming students to their peers in the classroom, receive more education and information about children with special needs, be understanding and caring, and devote a little more time to the adaptation of mainstreaming students. It has been concluded that, in terms of mainstreaming practices, families recommended students with normal development about being sensitive to students with special needs, mainstreaming them in group games and activities, being respectful, patient and tolerant, and learning about students with special needs. It has been discovered that, in terms of mainstreaming practices, families recommended preparing appropriate programs for students with special needs and receiving appropriate trainings for these programs, and that their social skills should be improved, and self-confidence development should be supported. Additionally, it has been observed that families recommended the other families of students with special needs about the need to know their children in every way, about supporting their children in every field such as education, sports and music, valuing mainstreaming students and making them feel that value, being attentive and investigative for mainstreaming students, being open to cooperation and communication with executives and teachers, being patient, supporting their children and peers to adapt, and encouraging mainstreaming practices.

This research has been conducted on the families of thirty-three students with learning disabilities, mental impairment, physical impairment, autism spectrum disorder, and attention deficit and hyperactivity disorder in Kayseri. Similar research can be conducted with the families of children who are in a single disability group.

Advanced research can also be recommended with the participation of families throughout Turkey. Provide dates defining the periods of recruitment and follow-up and the primary sources of the potential subjects, where appropriate. If these dates differ by group, provide the values for each group.

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Case Study on Science Teacher Candidates' Understanding of the Wave Concept

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Abstract

This study aimed to determine science teacher candidates' understanding of the wave concept under the headings of the essential characteristics of waves and their place and importance in daily life. The research was carried out with 53 science teacher candidates studying in the first grade in the education faculty of a state university in Turkey in the 2021-2022 academic year. The research used a criterion sampling method to determine teacher candidates. It also employed the case study method, one of the qualitative research methods. To determine the opinions of teacher candidates on the wave concept, researchers developed data collection tools containing ten open-ended questions. The questions in the form, a data collection tool in this study, were prepared to include conceptual, transactional, and relational categories. Three questions were conceptual, four were transactional, and three were relational. Evaluating the study's findings in general terms, we can conclude that the candidates knew the concepts related to the wave. Still, they were not successful in explaining the wave concept, classifying them according to physical characteristics, and indicating the characteristics of wave types.

Keywords: Wave Concept, Conceptual Understanding, Science Teacher Candidates

1. Introduction

Although concept teaching is one of the crucial goals in science teaching, many studies reveal that many students fail to understand basic scientific concepts in depth. Understanding and developing students' conceptual understanding has been a fundamental goal in science education in recent years (Nieminen et al., 2012). However, many students often fail to understand science concepts in depth, making it difficult for students to apply what they have learned.

One of the critical problems encountered in concept teaching is students' misconceptions. Misconceptions can be interpreted as misunderstandings incompatible with the scientific explanation of natural events or phenomena that occur in the real world (Modell et al., 2005). Students' experiences with physical events may lead to incorrectly biased ideas or misconceptions about physical concepts (Neidorf et al., 2020). Misconceptions often have a negative impact on students' science learning in later years because they produce a result that prevents the learning of a scientifically accepted concept. In addition, misconceptions have a cumulative effect on students, ranging

from primary education to the point where they have a certain level of expertise (Chen et al., 2019; Potvin & Cyr, 2017).

According to Bao & Koenig (2019), science education aims to develop high-level reasoning skills and promote deep conceptual understanding in the twenty-first century. For this purpose, many models and definitions have been created to examine and define students' conceptual information status and development. As a result of the examination of some studies on modelling, students' information structures have shown that learning depends on the context. It has also been concluded that students with poor conceptual understanding often have information structures associated with isolated conceptual structures that cannot establish similarities and contrasts between contexts (Bao & Koenig, 2019).

Gaining conceptual understanding, thinking, and problem-solving skills are the expected results in 21st-century science learning (Resbiantoro et al., 2022). The OECD Future of Education and Skills 2030 project defines information as "covering facts, concepts, ideas and theories about certain aspects of the world". In the OECD Learning Framework 2030, a product of the same project, four different types of information are mentioned: discipline, interdisciplinary, epistemic and procedural. Interdisciplinary information can help students transfer information from one discipline to another. Thanks to it, students can learn to convey critical concepts or big ideas across different disciplines (Harlen, 2010). However, when students do not understand the concept, their ability to apply it to a new situation or discipline decreases considerably. Key concepts or big ideas are included in every subject, but they can be recognized as "meta-concepts" or "macro-concepts" on different subjects (Erickson et al., 2017). According to Day & Goldstone (2012), students should recognize structural or conceptual similarities to transfer their previous information to the new situation. However, studies on this subject show that students are unsuccessful (OECD Future of Education and Skills 2030 project).

As a result of the integration of twenty-first-century skills into the Physics Education Research (PER) literature, a broadly defined set of education and research goals has been proposed for future PER studies. One of these proposals is discipline-specific deep learning. Also, some popular frameworks are conceptual understanding, problem-solving, information structure, deep learning and information integration. The other is discipline-based ideas, intersecting concepts and practices. What is meant by intersecting concepts here is to develop transferable scientific reasoning skills (Bao & Koenig, 2019).

The wave concept and Its Significance

The wave concept is one of the essential and basic concepts of science. Because it includes a wide range of physics subjects such as acoustics, optics, quantum mechanics and electromagnetic waves, in other words, this comprehensive field within physics contributes to a better understanding of physics (Aykutlu et al., 2022). Understanding vibration and wave concepts, as in other physics subjects, requires not only students' basic understanding of information but also complex thinking to understand the characteristics and types of waves (Furqani et al., 2018). In this respect, an in-depth understanding of mechanical waves is crucial (Xie et al., 2021). Teaching about wave structure and function is a critical element of science programs, and Next Generation Science Standards (NGSS) are supported by Applications in Waves and Information Transfer Technologies. To support students in learning these ideas, teachers often aim to develop wave chart models that define different aspects of students' wave structure (Enderle et al., 2021).

According to Xie et al. (2021), the propagation of a mechanical wave is the collective movement of a multiparticle system defined as the environment, which is new to most students and difficult to conceptualize. In teaching wave behaviour, many new concepts, such as speed and energy, go beyond particle-based identification, such as wavelength, period, frequency, and amplitude, and are used to describe particle-like objects. As a result, it can be difficult for students to understand the nature of waves and their difference from particle-like objects.

Today, interdisciplinary concept teaching or concept-based teaching is gaining importance. The wave concept is a concept that has an interdisciplinary characteristic, and we frequently encounter it in our daily life. On the other hand, the research revealed many deficiencies related to understanding the wave concept and its essential characteristics at all levels. Wiyantara et al. (2021) conducted descriptive research to determine the perceptions

and representation levels of secondary school students regarding wave concepts. The results of the research show that there are many students with a deficiency of information and misconceptions. Tumanggor et al. (2020), in their research with 35 physics education students and aimed to determine the misconceptions of teacher candidates about mechanical waves, stated that the biggest misconception they detected was about the general characteristics such as waves represented by the graph and wave frequency, wave source and environment. According to the results of the Mechanical Waves Conceptual Survey (MWCS), designed to evaluate the level of understanding of four main subjects such as propagation, superposition, reflection, and standing waves, Barniol & Zavala (2016) conducted a study with 541 university students. They concluded that students had more difficulty in propagation and standing waves and especially in the subtitle of sound. They had less difficulty in superposition and reflection. Taşlıdere (2021) investigated the individual and relative effectiveness of two conceptual change practices on the conceptual understanding of science teacher candidates and their misconceptions of mechanical waves. He consequently showed that conceptual change texts enriched with concept cartoons might be more effective in increasing students' conceptual understanding levels and reducing misconceptions about mechanical waves. In their study with 13 teacher candidates, Aykutlu et al. (2021) aimed to determine the candidates' conceptual understanding regarding the standing wave concept. As a result of the research, it was determined that there were problems in teacher candidates' conceptual understanding of the standing wave concept and that they also had incomplete information and unscientific opinions. Gülçiçek et al. (2018) designed three experiments and experimental instructions to determine the effect of different laboratory approaches on the understanding of wave concepts of physics teacher candidates. When they evaluated the pre-test and post-test results and the interview results with students after the applications, they stated that their applications did not yield convincing results. Küçüközer (2010), in his study with science teachers candidates, aimed to describe the conceptual understandings of teacher candidates about the primary events and concepts of wave physics, the creation, spread and initiative of mechanical waves, and to identify misconceptions. The study determined that teacher candidates had misconceptions about mechanical waves' basic phenomena and concepts.

The wave concept and related subjects are given in detail in the 10th and 11th grades in the high school program in Turkey. The wave concept is critical because it has an interdisciplinary character and is a concept we frequently encounter daily. Research on the subject reveals the existence of many deficiencies related to understanding the wave concept and its essential characteristics in each level of students since it is impossible to go further without understanding the wave concept and its characteristics. Most studies have focused on mechanical waves, such as the propagation of waves, standing waves, sound, water and spring waves. This study, unlike others, aimed to understand what the wave concept is, to know the essential characteristics of waves and to determine the understanding of the wave concept in our lives and its importance.

The research problem in line with the purpose is "What are the understandings of science teacher candidates about the wave concept?"

Sub-problems are as follows:

1. What is the level of science teacher candidates' understanding of the wave concept?
2. What is the level of science teacher candidates' understanding of general wave concepts?
3. What is the level of science teacher candidates' understanding of wave types?
4. What is the level of science teacher candidates' understanding of the importance of waves?

2. Method

The research employed the case study method, one of the qualitative research methods. Case studies focus on the selected situation or problem to examine the subject investigated in detail (Creswell, 2014).

2.1 Participants

The research was conducted with 53 science teacher candidates studying in the Science Teaching Department of the Faculty of Education of a state university in Turkey in the 2021-2022 academic year. Forty-one of the candidates who participated in the research were females, and 12 were males. The research used a criterion sampling method to determine teacher candidates. For this purpose, the fact that teacher candidates took the Physics course in the 10th and 11th grades of high school was determined as a criterion.

2.2 Instruments and Procedures

A data collection tool was developed based on high school physics course achievements, relevant literature review and expert opinions To determine the teacher candidates' understanding of the wave concept. Moreover, a pilot application was conducted with three teacher candidates who had taken the Physics I course in the science teaching program to determine the intelligibility of the questions. The developed data collection tool contained 10 questions about the waves unit taught in the course. The questions were prepared to include conceptual, transactional, and relational categories (Durukan, 2019). Questions 1 to 3 in the data collection form were conceptual, 4, 5, 6 and 7 were operational, and 8, 9 and 10 were relational. Data collection forms were given to teacher candidates during the course, and they were expected to answer within two lesson hours. The questions given to teacher candidates through data collection forms are shown below:

- 1- What is a vibration movement? Give an example of a vibration movement.
- 2- Explain the wave concept, and write down all the characteristics you know about the wave concept and the related concepts.
- 3- What does wave movement mean?
- 4- Draw a wave image to show all the characteristics you know of the shape.
- 5- How are waves classified according to their physical characteristics?
- 6- What are the wave types? Write down the examples you know of these types.
- 7- Write the characteristics of the wave types and give examples.
- 8- Explain whether waves matter in our daily lives.
- 9- Write down the wave examples you may encounter in your daily life.
- 10- Give examples by specifying the beneficial and harmful characteristics of the waves.

2.3 Data Analysis

Content analysis was applied to the data obtained from the teacher candidates through written forms. Then the codes, categories and themes that emerged from the students' expressions in the written forms were determined separately by two researchers. After this stage, the researchers came together and evaluated the results. The reliability of the findings was determined as 81% consistency using Miles & Huberman's (2002) method, and the states where there was a difference between the researchers were re-evaluated, and the final state was reached. The results were presented in tables by bringing them together within the framework of themes. The volunteer teacher candidates in the study were informed about the purpose of the study and acted under research ethics. The participants were coded as S1, S2... to protect the confidentiality of the candidates.

3. Results

As the first sub-problem in the study, two questions were asked to the science teacher candidates to determine their level of understanding of the wave concept. Within the scope of the first question, they were asked to define the vibration movement and give examples of it. Four main themes emerged from the answers of teacher candidates regarding this question. The most frequently mentioned themes were "periodic oscillation movement around the equilibrium point" with ($f=25$) and "movement caused by the contact of particles in a material environment" with ($f=13$). Other themes were listed as ($f=6$) "movement caused by waves" and ($f=3$) "movement formed when force is applied". Figure 1 shows the resulting themes.

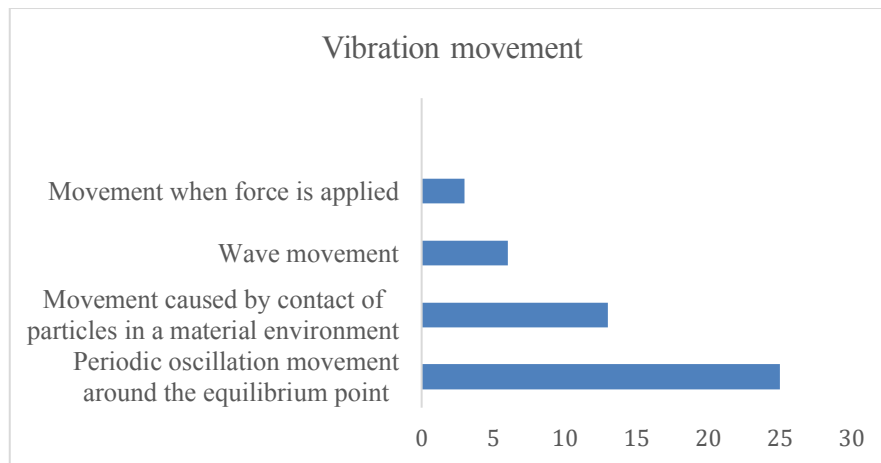


Figure 1: Themes for defining vibration movement

Examples of student statements for the first question are given below.

S11 "It is the event of mobilizing the object with the mechanical effects applied by the atoms that make up a substance. Trembling movement of drums, drums, etc. while playing".

S15 "Vibration is constantly moving between two points in a certain period. For instance: movement of the pendulum of the pendulum clocks".

S20 "It is the movement formed by the union of force with the material environment".

S39 "It is the periodical movement of something. Guitar wire can be given as an example".

The first part of the second question about the same sub-problem asked for an explanation of the wave concept, and the second part asked about the characteristics of the wave concept were asked in the second part. While 27 teacher candidates could not answer this question, four themes for the wave concept emerged from the answers of 26 teacher candidates. These themes were defined as movement caused by vibration ($f=16$), movement caused by matter interaction ($f=5$), periodical movement ($f=3$), and mechanical deformation ($f=2$). Regarding the characteristics of the wave concept, ten themes emerged. These themes were defined as period ($f=19$), frequency ($f=19$), wavelength ($f=18$), amplitude ($f=15$), speed ($f=12$), peak ($f=6$), wave pit ($f=6$), energy ($f=1$). On the other hand, some students wrote down characteristics unrelated to the wave concept ($f=9$). Figure 2 and Figure 3 explain the themes obtained.

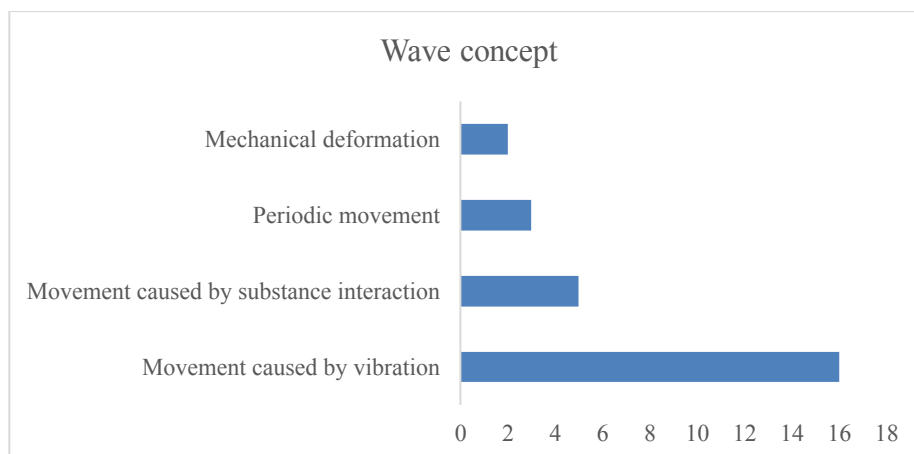


Figure 2: Themes for explaining the wave concept

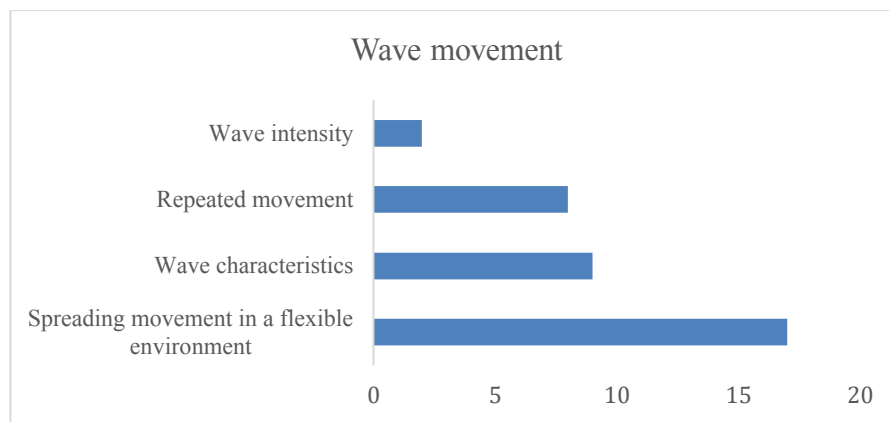


Figure 3: Themes for the characteristics of the wave concept

Examples of teacher candidates' statements regarding the second question are given below.

Examples of explaining the wave concept:

S10 "Wave is the movement that occurs due to vibrations".

S23 "The shape formed in the environment changes while the energy transferred to the environment by the vibration movement is transferred from one place to another".

S25 "It is the spread of the energy generated from the vibration movement from one point to another. Wave is the energy transfer".

S42 "It is the movement of an item collectively due to other factors".

S51 "The wave consists of vibration movements".

Examples of characteristics of the wave concept:

S12 "Wavelength, frequency, period, wave source and environment".

S13 "Wave peak and pit, amplitude, wavelength, source".

Questions 3 and 4 were asked to investigate the level of science teacher candidates' understanding of general wave concepts as the second sub-problem of the study. The third question asked to define the wave movement, and conclusively four themes emerged, which were determined as propagation movement in a flexible environment ($f=17$), wave characteristics ($f=9$), repeated movement ($f=8$), and wave intensity ($f=2$). Seventeen students did not respond to this question. Figure 4 summarizes the themes and categories obtained for question 3.

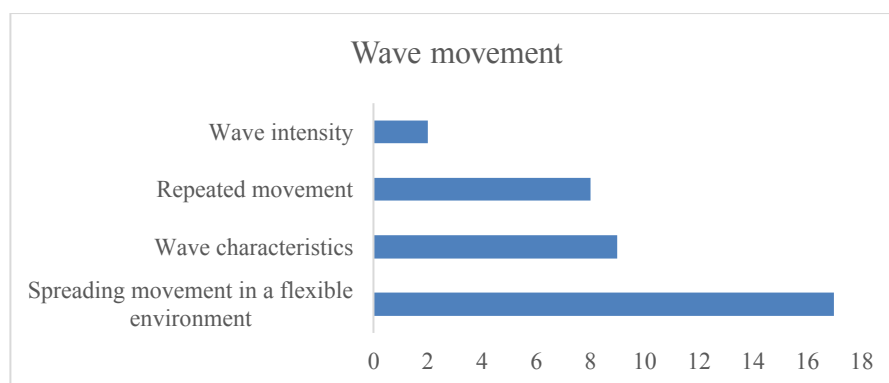


Figure 4: Themes for defining wave movement

Examples of teacher candidates' expressions of wave movement are given below.

S11 "Mechanical shapes formed from the force we apply to the material from the inside or outside are called wave movements".

S24 "It is the vibration movement emitted in space or material environment".

S26 "It is the progress of the wave by travelling".

S34 "It is the movement that occurs due to regular advances in repetitive movements".

S36 "Movement from a source and formed in specific periods is called wave movement".

S32 "It is the movement in environments such as air and water".

In the fourth question, the candidates were asked to draw a wave picture and show the characteristics they knew about it. Three categories emerged when the answers of the candidates who drew shapes were examined. For this question, there were only 2 drawings in which all the characteristics were shown correctly. There were also 28 drawings in which all characteristics were not shown, and 21 were incorrectly made drawings. Apart from this, two candidates made drawings. Figure 5 summarizes the themes and categories obtained for question 4.

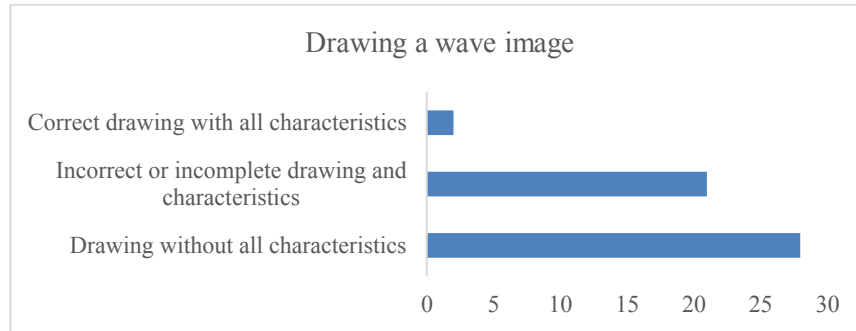
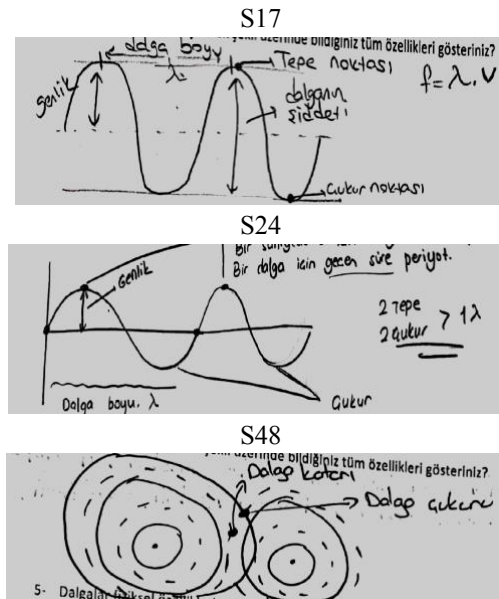


Figure 5: Categories for characteristics representation by drawing a wave image

Examples of characteristics representation by drawing a wave image:



Within the scope of the third sub-problem of the study, questions 5, 6, and 7 were asked to investigate the level of science teacher candidates' understanding and wave types. In the fifth question, it was asked to classify the waves according to their physical characteristics. When the answers were examined, it was seen that classifications were made according to the vibration direction ($f=33$), the direction and the energy they carry ($f=3$), and the energy they carry ($f=1$). Still, there were also unclassified responses ($f=5$). The sixth question asked about wave types and their examples. In the examination of the answers obtained, three themes emerged: electromagnetic ($f=44$), mechanical ($f=40$) and mechanical and electromagnetic ($f=3$) wave examples. Under this question, 6 students gave unclassified examples. The seventh question asked about the characteristics of wave types. While there were only 2 complete answers in which the characteristics of wave types were given correctly, other answers were determined as mechanical and electromagnetic wave characteristics ($f=11$), mechanical wave characteristics ($f=3$), and electromagnetic wave characteristics ($f=3$). Figures 6, 7, and 8 show the themes obtained for questions 5, 6, and 7.

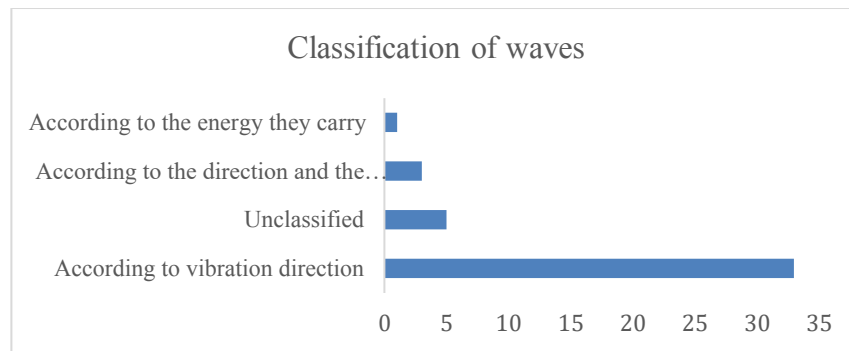


Figure 6: Themes for classifying waves according to their physical characteristics

Examples of teacher candidates' statements regarding questions 5, 6, and 7 are given below.

Examples of classification of waves according to their physical characteristics:

S6 "Transverse waves, longitudinal waves".

S10 "Water, spring waves, Em waves".

S44 "Classified according to vibration direction (transverse, longitudinal) and energy (mechanical and electromagnetic)".

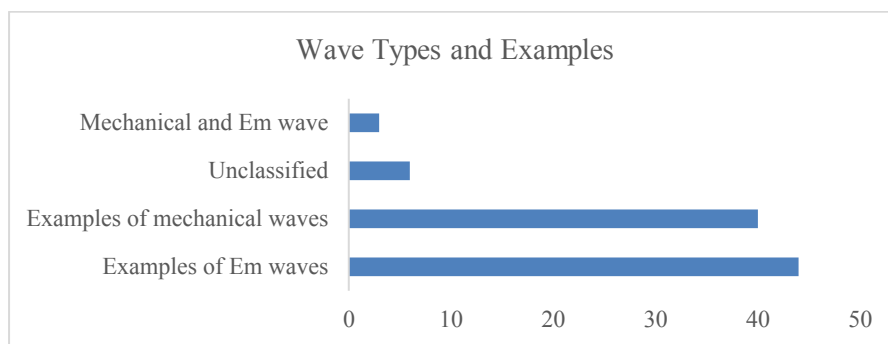


Figure 7: Themes for wave types and examples

Examples of wave types and examples

S19 "Sound, water and absorption wave".

S26 "Electromagnetic waves (radio, ultraviolet, x-ray, microwave) and mechanical waves (earthquake, water, spring, sound)".

S41 "Transverse waves(water wave), Longitudinal waves (Radio waves)".

S46 "Sound, earthquake, water wave".

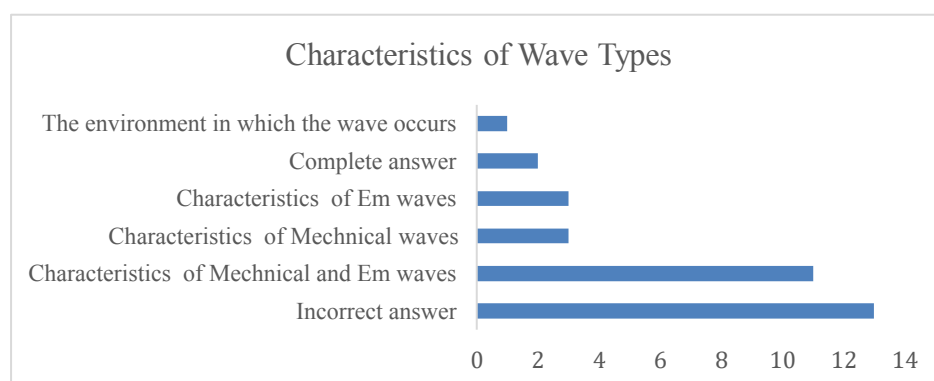


Figure 8: Themes for the characteristics of wave types

Examples of characteristics of wave types:

S8 "Water wave speed decreases while passing from deep to shallow environment".

S29 "Waves that need the environment for the spread of mechanical waves, electromagnetic waves, waves that spread without the need for the environment".

S51 "Waves in the MRI device may cause diseases in our body".

Within the scope of the fourth sub-problem of the study, questions 8, 9 and 10 were asked to investigate the level of science teacher candidates' understanding of the importance of waves. The eighth question asked about the importance of waves in our daily lives. In the examination of the answers were examined, 6 themes emerged: their importance in communication ($f=26$), health services ($f=16$), technology ($f=13$), energy acquisition ($f=3$), use in technological tools ($f=1$) and vision ($f=1$). The ninth question asked examples of the waves encountered in daily life. In examining the answers obtained, statements like mechanical wave samples ($f=47$) and electromagnetic wave samples ($f=42$) were obtained. The tenth question, the last question, asked about the beneficial and harmful characteristics of the waves. Beneficial electromagnetic wave characteristics ($f=22$) were determined as beneficial mechanical wave characteristics ($f=21$), while harmful electromagnetic wave characteristics ($f=34$) and harmful mechanical characteristics ($f=19$). Figures 9, 10, and 11 show the themes obtained for questions 8, 9, and 10.

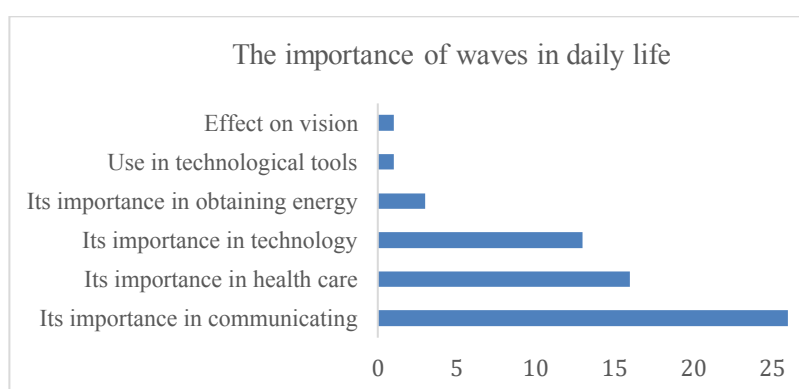


Figure 9: Themes for the importance of waves in daily life

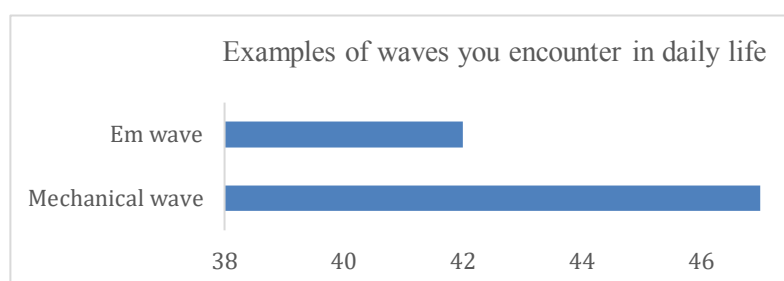


Figure 10: Themes for wave examples encountered in daily life

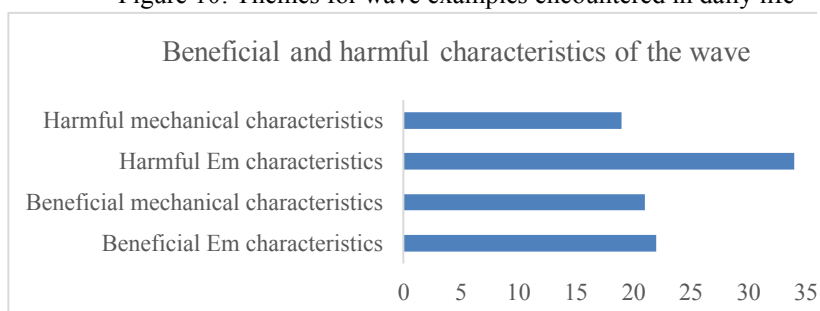


Figure 11: Themes for the beneficial and harmful characteristics of wa

Examples of teacher candidates' statements regarding questions 8, 9, and 10 are given below.

S5 "We obtain energy through waves".

S10 "Waves allow energy to be transported from one place to another, a beneficial characteristic".

S20 "Waves are frequently encountered in technological devices in the health field. In this respect, it is crucial."

S37 "Waves are important in our daily life because they spread as sound waves in our communication. Em waves are also important in medicine and chemistry".

S48 "Earthquake waves are essential in our daily life".

S29 "We can give examples of radio waves, microwave, topwater, arc, earthquake and infrared waves to the waves we encounter daily".

S30 "X-rays and gamma rays from Em waves are harmful to human health. The sound wave is vital in the diagnosis of diseases using ultrasound devices. "

S51 "In our daily life, we encounter sound, light and water waves".

4. Discussion

The research questions were prepared to include conceptual, transactional, and relational categories (Durukan, 2019). Questions 1 and 3 in the data collection form were conceptual. The answers to these questions were evaluated as correct, incomplete, unscientific or no. Examples of correct answers to conceptual questions included S15(vibration), S23(wave), S24(wave movement), incomplete category S39(vibration), S51 (wave), S36(wave movement). The students mostly gave meaningless answers to conceptual questions, as seen in the examples of S20 (vibration) and S42 (wave), and S11(wave movement). These three concepts were related to each other. For example, wave and wave movement concepts cannot be understood without the vibration concept. Many students defined the wave concept as just a vibration or rising and falling movement inspired by the water or sound waves we often encounter daily. They could not use characteristics such as "Flexible environment", "Energy transferred to the Flexible environment", and "Shape change created in the environment while this energy is transmitted from one point to another" in their definition. Some of the students gave examples instead of conceptual explanations. In addition, they wrote the concepts of frequency, period, wavelength and amplitude related to the wave. The results of the study conducted with students at all levels on the wave concept revealed the difficulty of creating basic concepts related to waves and various misconceptions were determined (Wiyantara et al., 2021; Tumanggor et al., 2020; Admoko et al., 2019; Caleon & Subramaniam, 2013; Kennedy & de Bruyn, 2011; Küçüközer, 2010; Şengören et al., 2009).

Another remarkable situation is that all candidates tried defining mechanical waves. No student defined or explained the Em wave. Although there were mechanical and Em waves in the textbooks, the concept of the mechanical wave mostly came to the mind of the students.

Questions four, five, six, and seven were transactional, and the answers to these questions were evaluated as correct, incomplete, unscientific or no. As seen from the data in Figure 5, only two candidates could draw correctly (S17 and S24), whereas most candidates (such as S48) either made incomplete or incorrect drawings. Some candidates drew pictures of water waves, and some drew pictures of wave interference or wave diffraction patterns. This situation revealed an idea of the fundamental wave pattern in the candidates' minds. Besides, they had some deficiencies, such as the representation of the wave and the basic magnitudes of the wave. In their study with physics teacher candidates, Tumanggor et al. (2020) determined that the waves and wave movement represented by the graph were in their general characteristics as the biggest mistake, and then stated that they had misconceptions about wave frequency, wave source and environment characteristics, respectively. Enderle et al. (2021) stated that teachers relied on the effect of using the graphic models of the wave by using digital resources or simulations to understand different aspects of the wave structure of the students. They also stated that such practices would contribute to students' design skills (drawing waves) and using scientific models.

The fifth research question asked candidates to classify the waves according to their physical characteristics. Only three candidates could perform the classification correctly, for example, as in S44. Most of the candidates stated only one characteristic, such as direction. Few candidates answered according to their energy or by giving examples (S6, S10).

The sixth question asked about wave types and their examples. Only three students classified the waves as Em and mechanical waves and gave correct examples (S26). Most students did not make a classification and answered by giving almost equal mechanical wave or Em wave examples (S19, S46). A few students responded by stating transverse and longitudinal waves (T41).

In the seventh question, students were asked to write the characteristics of the wave types they gave as examples. Only three students stated that the environment was needed to spread mechanical waves and that the environment was not needed for spreading Em waves (S29). Many students only gave examples or incorrect answers (S51, S8). In general, the percentage of correct answers was relatively low in the operational questions of the candidates (Figure 6-8).

Questions 8, 9, and 10 aimed to explain the importance of waves, the examples we encounter daily, and their beneficial and harmful characteristics. All the candidates stated that it was essential and expressed it as communication, health and technology in order of importance. They gave more examples of mechanical waves from our daily lives. While issues such as communication, technology, health, and energy acquisition come to the forefront among the beneficial characteristics of waves, frequently stated ones were tsunami and earthquake waves in mechanical waves as harmful ones that may be caused by Em waves (gamma and x-rays) (such as their effect on human DNA, causing cancer). As a result of the examination of the explanations and examples made by the candidates, it can be said that they were more successful in the relational dimension depending on their daily life experiences.

According to the findings obtained, we can conclude that the candidates were far from giving a scientific explanation for the wave concept. In the 10th-grade physics lesson curriculum, the wave concept is considered mechanical waves, and subjects related to mechanical wave examples are included in detail as a separate section. Em waves are included in the physical classification of waves, but the formation mechanism is not included, and explanations are made by giving examples. Nevertheless, in the research, students had difficulty explaining the wave concept, which can be accepted as scientific. Besides, in the 11th-grade physics lesson curriculum, Em waves are discussed in detail in the wave mechanics unit and explained by giving examples. On the other hand, no student mentioned the definition or formation mechanism of the Em wave. They were satisfied only with giving examples. It may have been caused by deficiencies in understanding the formation of Em waves and their abstract nature.

Similar results have been obtained in studies conducted with all levels about waves. Wesono et al. (2018) stated that students tend to perceive physics as a problematic issue, mainly because of the abstract nature of the wave concept. Tongchai et al. (2009), on the other hand, stated that understanding the wave, which is a concept taught at the high school level for the first time, plays a vital role in physics, even if many subjects are not understood. Tumanggor et al. (2020) stated that misconceptions about mechanical waves and related concepts were determined, and special attention should be paid to eliminate them.

As a result, students need to understand what the wave concept is. Therefore, considering the existing misconceptions and deficiencies, reviewing the existing strategies to produce and use appropriate technological applications will be beneficial.

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Self-Regulation Skills of Children within the Context of the Meanings that Mothers Attribute to the Concept of Child

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Abstract

This study aimed to determine the meanings that mothers attribute to the concept of child and examine the self-regulation skill levels of their children within the context of the meaning attributed to the child. The research was carried out with a mixed method design entitled “Completely Mixed Sequential Equal Status Design”. The study group of the research, which was determined by using the maximum variation sampling method, was composed of 297 mothers with 60-72 months-old children studying in private and public kindergartens in Efeler District of Aydın province in the 2020-2021 academic year. As the data collection tools in the study, Self-regulation Skills Scale for the Children Aged Between 4-6 (Mother Form) and structured interview questions were used. The qualitative data on the meaning that parents attributed to the concept of child were analyzed by using descriptive analysis. The quantitative data on the self-regulation skills of their children and the analysis of these variables within the context of the meanings attributed to the concept of child were performed by using SPSS 21 package program. As a result of the research, it was determined that the children were interpreted as investment tool, development, property, individual with rights, and innocent, respectively; and it was also revealed that little adult, sinner, God-given, and reflective categories present in the literature were not among the meanings attributed to children. When the self-regulation skills of children within the context of the meaning attributed to the child were examined, it was found out that the self-regulation skills of the children who were only interpreted as investment tool were high, and those of the children who were interpreted as development, property, individual and innocent were at a moderate level.

Keywords: Parent, Concept of Child, Self-Regulation, Mixed-Method

1. Introduction

The pre-school period is the period in which the development of the brain is the fastest, thus forming a strong basis for the cognitive, social, emotional, motor, and language development of the child (MEB (Ministry of National Education), 2013). Bloom (as cited in Senemoğlu, 2001) also stated that the pre-school period is a process of great importance, in which approximately 80% of the mental development of children is completed. There are developmental tasks to be fulfilled by children in the pre-school period. Among these developmental tasks, there are such tasks as being in harmony with society, establishing a balance between society and their own needs and desires, and improving academic skills. One of the most significant skills in the implementation of these

development tasks is self-regulation skills (Tekin, 2018). Children begin to use various mental strategies to control their thoughts, feelings, and behaviors in achieving the goals they have set for themselves, and this skill is the self-regulation skill, which is defined as the highest level skill to be acquired in this period (Bayındır, 2016).

Self-regulation skill is composed of sub-dimensions that are separate from each other but intertwined within in terms of development and work (Findık Tanrıbuyurdu & Güler Yıldız, 2014). There are different designations regarding the sub-dimensions of self-regulation. For example, McClelland et al. (2007) stated that the sub-dimensions of self-regulation are behavior regulation and social skills. Smith Donald et al. (2007) determined the sub-dimensions of self-regulation as attention, behavior, and emotion regulation; whereas Erol and İvrendi (2018) examined the self-regulation skills in the scale they developed in order to evaluate self-regulation skills in accordance with the views of parents from a cognitive perspective, and in forming the conceptual basis of the scale, they used working memory, attention and prohibitive control components of the driving functions that contribute to self-regulation skills (McClelland & Cameron, 2012).

Driving function, which is stated to contribute to self-regulation skills, consists of cognitive skills that enable us to consciously control reactions, thoughts, emotions, and behaviors, which can therefore be defined as a critical piece for self-regulation skills (Mischel, 2016). Among driving functions, attention component, the importance of which is emphasized for self-regulation skills, is defined as the ability to regulate, coordinate, maintain attention for a certain goal, ignore irrelevant stimuli or distracting elements, and monitor attention alone (Ruff & Rothbart, as cited in Harris et al., 2007). Working memory, which is another component associated with self-regulation skills, is the ability to store and process information for a short period of time (Klingberg et al., 2002). Prohibitive control, which is defined as the third component, is described as preventing impulsive reactions and performing/distributing an opposite action (Carlson & Wang, 2007).

The development of self-regulation skills starts from birth and has great importance in increasing the quality of life in the individual in terms of school, work, and social life (Sezgin & Demiriz, 2016). Being an individual having the skills of delaying/suppressing their wishes, feelings and behaviors, and managing their attention and emotions throughout life (Aydın & Ulutaş, 2017), in short, being an individual with self-regulation skills is associated with such important points in the individual's life as being more competent in terms of social and cognitive aspects, and having higher academic competence in examinations in adolescence (Mischel et al., 1989); having low body mass index, high self-confidence, and being successful in coping with stress in adulthood; experiencing decreased addiction and obesity probability in middle age (Mischel, 2016). Children with advanced behavior regulation skills are more advantageous in terms of adapting to school rules and finding the opportunity to learn (Sezgin & Demiriz, 2016); and those who are able to control impulse, attention, and emotion are also more advantageous in terms of adapting to school and fulfilling their responsibilities when starting primary school (Tekin, 2018). Having developed self-regulation skills is of great importance for academic skills involving the child's motivation for learning, creativity, and problem-solving skills (Whitebread et al., 2009). Despite the fact that the above-mentioned benefits of self-regulation for the child seem to be shaped within the framework of academic skills or expectations for the child at first glance, they actually bring along the skills that are not only important for childhood but also for life. Among these, the situations such as fulfilling the responsibilities and adapting to school or rules should not be understood as a situation limited to school because children with advanced regulation skills towards school, rules, or responsibilities will be able to find solutions to an unusual problem they will face in the future by maintaining the same skills and motivate themselves according to what they are able to do. Thus, they will be individuals who can easily live within society. For this reason, it is thought that having self-regulation skills is such a skill that parents and even society would like their children to have. While it is pleasing that this desired skill is a skill that can be learned and developed by using certain strategies (Mischel, 2016), it also brings certain responsibilities to parents, educators and all people who touch the child's life.

For self-regulation skills, the first years of life are of great importance as they form the basis of the skill and ensure that it is permanent (Tuzcuoğlu et al., 2019). As mentioned before, it is crucial to support this skill, which is extremely significant in terms of learning, development, and participation in life, at an early age (Findık Tanrıbuyurdu & Güler Yıldız, 2014), and parents play an important role in terms of self-regulation skills, just as they do in every aspect of the child's development (Bayındır, 2016). It is also supported by many theories and theorists that the parent has great importance and influence on the development of the child; Bronfenbrenner

(1986), who emphasizes the importance of parental characteristics on the child by including the family in direct interaction with the child in the first ring of his Ecological Systems Model, can be pointed as one of the prominent examples. Social Cognitive Theory also states that self-regulation develops by being indigenized within the social environment and over time (Zimmerman, 1989).

The pre-school period is the period when the brain is most vulnerable to the effects of the environment due to the rapid development of the brain, and the environment deeply affects the development of the child. Especially in the first years of life, the most influential factor regarding the child's environment is the family (MEB, 2013), and the attitudes of parents completely affect the child's personality development (Senemoğlu, 2010). The important effects of parents on the development of the child continue to be influential in terms of the development of self-regulation skills. Considering the fact that even the variables that are relatively less directly related to the child such as the age (Eke, 2017; Sezgin & Demiriz, 2016), educational status (Doğruyol et al., 2018; Ertürk Kara & Gönen, 2015; Sezgin & Demiriz, 2016; Tekin, 2018) or work status (Eke, 2017; Sezgin & Demiriz, 2016) of the parent are associated with the child's self-regulation skills, it is thought that the meaning that parents attribute to the concept of child, which is thought to affect the parent's behavior towards the child, will be associated with the child's self-regulation skills.

Although there are different definitions of child and childhood, the common point of all is that childhood is a concept that develops by being influenced by the cultural and historical aspects of society (Akbaş & Atasü Topçuoğlu, 2009; Erdiller Yatmaz et al., 2018). Childhood is not universal (Demir Gürdal, 2013), on the contrary, it is a concept that can differentiate in the society it is in, even in different regions of the same society, and contains cultural values by being influenced by various elements of that region. The meaning of the concept of childhood facilitates the comprehension of society (Eraslan, 2019; Tan, 1989). The definition of Toran (2012) regarding the historical development of the concept of childhood and the perceptions of children within societies stating that the concept refers to a little adult, a sinner child, a property child, a child as an investment tool, and a child who is an individual with their own rights, shows that the meanings attributed to the concept of child by society and individuals who are a part of the society are intertwined with the development of the concept of childhood.

The fact that parents have legal and economic control over their children is a phenomenon that exists in every society in every period of time. However, this power varies according to the period (Tan, 1989). Thanks to the changing perceptions and steps taken regarding the child and childhood, it can be seen that the child is put in the center and respected as an individual in the 21st century (Sağlam & Aral, 2016), while the understanding in terms of children in the early ages was absolute authority. Considering the history of the approaches towards children; it can be noted that in pre-Islamic Turkish societies, for instance, the child was given special importance and even those who did not have children were despised, child education especially for boys was given great importance, and the father did not have endless rights over the child regarding the right of custody (Aksoy, 2011; Arı & Karateke, 2010). When it comes to the Middle Ages; it can be seen that the special importance given to children in Turkish society continued, children were regarded as innocent beings who needed to be protected and educated (Özdemir, 2002; Sağlam, 2002), and in the 10th century, there were intellectuals who put forward important ideas pointing to the current approach to the education of children and children's rights (Durakoğlu, 2014; İnan, 1983; Koçyiğit et al., 2007; Sağlam & Aral, 2016, as cited in Yavuzer). In the same period, in the Middle Ages Europe, it is observed that the child began to be discovered in the 13th century and developed in the 16th – 17th centuries, that there was no childhood as a reflection of an understanding that did not discriminate the child from the adult until these dates, and therefore there was no idea that children were innocent beings who needed to be guarded and educated in the mentioned period (Aries, 1962; Taşkın, 2006). This understanding, which is called modern childhood in the West, covered only middle and upper-class boys, instead of covering all children despite the awakenings experienced in the period, and became a concept that included both class and gender discrimination (Aries, 1962; Demir Gürdal, 2013, as cited in Gittins). The establishment of modern Western childhood as the universal ideal; the definition of children as beings who are not yet grown up but develop with their deficiencies compared to adults, and as happy beings going to school and being in the ideal middle class has been broken with the realization that children who are exposed to such conditions as hunger, poverty, war, and economic abuse do not have an ideal childhood, especially in underdeveloped countries (Demir Gürdal, 2013). The awareness experienced brought with it an understanding in which the identity and personality of the child came to the forefront in the 18th and 19th centuries, which led to the emergence of new ideas and an increase in studies on

children in that period (Sağlam & Aral, 2016). Known for her important works and approach towards children, Montessori, who has an important position in terms of the development of the child, made a striking comparison of the perception of the child in the parents of the period and stated that even when compared to a slave, the child is in a worse situation in terms of facing barriers, being considered as a property, and ignoring their rights (Sağlam & Aral, 2016).

The state of awareness in terms of the difficulties faced by the child affected the meaning attributed to the child and enabled the child to be redefined. Studies on scientific and human rights have changed all concepts and definitions regarding the child, which paved the way for taking steps for the child (Gander & Gardiner, as cited in Sağlam & Aral, 2016). The New Childhood Sociology, which is the sociological approach to the child and childhood today, indicates different childhood constructions and emphasizes the fact that children are a heterogeneous group with different characteristics, and exhibits that childhood is open to so much diversity that it cannot be limited ideally. When the New Childhood Sociology is examined, it can be seen that there are such ideas advocating that childhood is not universally uniform, on the contrary, its historical and social character is determined by its differences, that childhood cannot be determined only from a biological point of view emphasizing development, and that children may differ from adults in such matters as attention and needs but are also social actors within society (Demir Gürdal, 2013). Parallel to this situation, children in the 21st century are defined as the co-constructors of knowledge, identity, and culture, and as the individuals who represent a certain group of society and have their own rights since they are fully participating members of the society just as adults (Dahlberg et al., as cited in Erdiller Yatmaz et al., 2018). The social and economic changes experienced in Turkey over time, just as all over the world, paved the way for the change in the Turkish family structure (Bayer, 2013) and caused the immediate family model to replace the traditional family model (GDFCS (General Directorate of Family and Community Services), 2011). The differentiation of the society's family structure brings about the change in the perceptions and roles of parents and children (GDFSR (General Directorate of Family and Social Research), 2014). In the traditional family structure, where the immediate family structure has begun to take its place, the child is assessed based on the contribution to the labor or economic power of the family, and therefore it is desired to have more of them (Kağıtçıbaşı, as cited in Yurtsever Kılıçgün, 2015). In the immediate family structure, expectations regarding the contribution of the child to the family have been decreased, and the individual achievements of the child are emphasized (Sunar & Fişek, 2005). In summary, in the immediate family structure, it is emphasized that the child can be an individual who can stand on their own feet rather than their contribution to the family (Kağıtçıbaşı et al., 2001; Sunar, 2002). The change in today's family structure has led to a differentiation of the meaning attributed to the child, besides the reshaping of parental roles; and as a natural consequence of this fact, the place of the child within the family, the responsibility they take, the value they are attached, and the care they receive in the family have also changed. The fact that children are considered as individuals who need to stand on their own feet instead of beings in need of protection by adults has brought the existence of their rights in the family to an important point (Yurtsever Kılıçgün, 2015). Parents have begun to share their children's care needs with day-care centers, and this has led to a change in mothers' perceptions regarding parenting and enabled children to gain such competencies as individuality, emotional control, adequate self-perception, and early maturation (Dencik, 1989). At this point, the meaning attributed to the concept of child and the self-regulation skills required for children to "become individuals that are able to stand on their own feet" are thought to be associated with each other. Accordingly, it is considered that within the scope of the study, a step will be taken to fill the gap in the literature by examining children's self-regulation skills within the context of the meaning attributed to the concept of child, and the current study will be a guide for researchers who will carry out further studies in which these variables will be included.

This study aimed to determine the meanings that mothers attribute to the concept of child and examine the self-regulation skill levels of their children within the context of the meaning attributed to the child. In order to achieve this aim, the following sub-purposes were determined:

1. What meaning do mothers who have children in the pre-school period attribute to the concept of child?
2. What are the self-regulation skill levels of their children according to the views of mothers who have children in the pre-school period within the context of the meaning they attribute to the child?

2. Method

2.1. Research Model

In the study, the qualitative data obtained for the meaning that mothers attributed to the concept of child and the quantitative data on the self-regulation skills of children obtained in line with the views of the mothers were used. For this reason, the method of the study was designed as a mixed method in which quantitative and qualitative methods are used together. Mixed methods research is an approach in which both quantitative and qualitative data/techniques are combined in a single study or in a series of closely related studies (Christensen et al., 2015). Furthermore, according to the statement of Christensen et al. (2015), for a research to be called a mixed method, it is required to combine the qualitative and quantitative findings at any stage of the study. Many types of designs to be used are suggested in mixed method research. These designs, which are approached in different ways by different researchers, are in such a structure that cannot be fully limited due to their probability to be transformed into different forms and that can be altered and organized according to needs (Teddlie & Tashakkori, 2020). The mixed method design, which was thought to be the most appropriate design to be used within the scope of this research, was determined as “Completely Mixed Sequential Equal Status Design”, which is one of the typologies suggested by Leech and Onwuegbuzie (2009). The mixed method designs suggested by Leech and Onwuegbuzie (2009) are determined by taking three dimensions into consideration during the design process. These dimensions are determined based on these dimensions: (a) determining to what extent (partially or fully) the mixed structure is mixed, (b) timing the data collection/data analysis process (simultaneous or sequential), and (c) emphasizing the approaches in the study (equal or dominant status). “Completely Mixed Sequential Equal Status Design” is a design in which quantitative and qualitative data are brought together in one or more stages of the research process (completely mixed), qualitative and quantitative stages are conducted in a certain order (sequential), and qualitative and quantitative stages are given equal focus/importance (equal status) (Leech & Onwuegbuzie, 2009). Due to the fact that the qualitative and quantitative data obtained within the scope of this study were brought together (completely mixed), that the qualitative stage of the study was required to be analyzed first (sequential), and that both qualitative and quantitative stages had equal importance (equal status), “Completely Mixed Sequential Equal Status Design” was used in the study.

2.2. Population and Sample

The population of the research was composed of the mothers of the children who continued their education in the private and public kindergartens of Aydın Province in the 2020-2021 academic year. The sample of the research was composed of those who had children (60-72 months old) studying in the private and public kindergartens of Efeler district in Aydın province in the 2020-2021 academic year; a total of 297 mothers who differed from each other in terms of socioeconomic level and educational status. In the study, great attention was also paid to the fact that the participants were mothers, and their children were in the age group of 60-72 months. The reason why the participation was restricted to mothers only was that one of the scales used in the study was the mother form, and the reason for limiting children's age was to ensure that the situations regarding children's self-regulation skills could be observed more explicitly. In the study, maximum variation sampling method was used so as to differentiate the socioeconomic level and educational status of the mothers from whom the data of the study were obtained. Maximum variation sampling is one of the purposeful sampling methods, and the main purpose of using this method is to reveal the common and divergent aspects of different situations determined in a manner consistent with research purposes, and thus providing a more comprehensive description of the problem (Büyüköztürk et al., 2018). Accordingly, it was aimed to reach the whole population in order to achieve maximum variation. To be able to determine the sample of the research, first of all, Aydın Provincial Directorate of National Education was contacted, and in line with the data obtained from the Provincial Directorate of National Education Statistics Office, private and public kindergartens of Efeler district, in which 60-72 months old children attended, were reached via phone call. By sharing the permissions obtained from the Ministry of National Education and Educational Research Ethics Committee with the administrators of the institutions contacted, it was ensured to reach the mothers of the children who continued their education in each institution. The link prepared via Google Forms was sent to the mothers of 3217 children in Efeler district through schools and teachers in order to include them in the research, but 368 forms were returned. Also, the data sets that did not meet the inclusion criteria were excluded from the study. Accordingly, the forms of the participants whose children's birth dates did not comply with the process or who responded to the same data set more than once were not included in the research.

2.3. Data Collection Tools

Within the scope of the research, the data including various personal information of the mothers and their children, the meanings that the mothers attributed to the concept of child, and their views regarding their children's self-regulation skills were collected. For this reason, Personal Information Form, Self-regulation Skills Scale for the Children Aged Between 4-6 (Mother Form) (Erol & İvrendi, 2018), and the interview questions compiled by utilizing the interview protocol of the studies on child perception (Erdiller Yatmaz et al., 2018, 2019) and finalized by adding new questions were included in the data collection tools section. After obtaining the permissions of Aydın Provincial Directorate of National Education and the Educational Research Ethics Committee, as well as the permissions for the use of the scales used within the scope of the research, and finalizing the structured interview questions, they were transferred to the digital environment in order to be collected via Google Forms links.

2.4. Personal Information Form

In the research, the personal information form created to be able to obtain various information about the participants and their children (excluding the distinguishing questions) was composed of a total of seven questions; gender of the child, number of siblings, birth order, duration of pre-school education; maternal age, education level, and family income.

2.4.1. Self-regulation Skills Scale for the Children Aged Between 4-6 (Mother Form)

Self-regulation Skills Scale for the Children Aged Between 4-6 (Mother Form), which aims to determine the self-regulation skills of children aged between 4-6 years in line with the views of mothers, was developed by Erol and İvrendi (2018) and composed of 20 items. The scale is a five-point Likert-type scale and is scored as "Always" (5), "Mostly" (4), "Sometimes" (3), "Rarely" (2), and "Never" (1). The scores that can be obtained from the scale are evaluated between 100 (the highest) and 20 (the lowest), and it can be interpreted that as the score increases, the child's self-regulation skills get better. In the scale, in which the child's self-regulation skills are evaluated on the basis of four factors in line with the views of the mother, the names of the factors were determined as working memory, attention, prohibitive control-behavior, and prohibitive control-emotion (Erol & İvrendi, 2018). The attention factor includes six items and explains 36.21% of the total variance. The working memory factor includes five items and explains 9.48% of the total variance. The prohibitive control-emotion factor includes five items and explains 8.96% of the total variance. The prohibitive control-behavior factor includes 4 items and explains 6.47% of the total variance. When the whole scale is examined, it is determined that it explains 61% of the total variance. As a result of the analysis on the reliability of the scale, it is revealed that the internal consistency coefficient of the whole scale is .90, whereas the coefficients of its sub-dimensions vary between .75 and .89, and the test-retest reliability coefficient is .77 (Erol & İvrendi, 2018). The fact that the reliability coefficient is between .70 and .99 indicates that the reliability of the scale is high (Büyüköztürk et al., 2018). Considering the fact that the reliability coefficients of the whole scale and its sub-dimensions are .75 and above, it can be said that Self-Regulation Skills Scale for the Children Aged Between 4-6 is a reliable scale with its four sub-dimensions.

2.4.2. Interview Questions for the Meanings That Parents Attributed to the Concept of Child

At the phase of determining the interview questions, the studies of the researchers working on child perception were examined first; and it was determined to use the compilation of the questions in the study by Erdiller Yatmaz et al. (2018, 2019) and add new questions related to the research topic. Accordingly, all the scholars included in the studies by Erdiller Yatmaz et al. (2018, 2019) were contacted via e-mail for the use of the questions they developed within the scope of their studies, and their approvals were obtained for the permissions to use the interview questions. Various questions were compiled in parallel with the interview protocol obtained in line with the approval of the authors, and the first version of the interview questions to be used within the scope of the study was formed as nine questions: "In your opinion, who is a 'child'?", "If you were to describe 'child' with three words, what would these three words be?", "What is the first characteristic that comes to your mind when I say 'child'?", "Are there any differences that distinguish the child from the adult?", "What can/should the child do and what cannot/shouldn't?", "Who decides/should decide this and according to what?", "How would you describe

your own childhood?”, “Is there a difference between your own childhood and your current perception of ‘child’? (If so, what are these differences?)”, and “What could be the factors that lead to your current perception of ‘child’?”.

2.5. Data Collection

Before the data collection process of the research, the permissions of the owners of the scale for the use of the scale and then the permissions of the Directorate of National Education and the Educational Research Ethics Committee were obtained, and the schools were contacted via phone in order to deliver the data collection tools organized as Google Forms link to the participants. Each data collection tool described above was brought together to be presented in separate sections but under a single link and sent to the participants with their explanations.

2.6. Data Analysis

In the study, the qualitative data obtained from the interviews about the meaning that the parents attributed to the concept of child were examined through descriptive analysis. Descriptive analysis is a type of analysis in which the data obtained are summarized and interpreted according to previously determined themes, and the descriptions are enriched by using direct quotations from the views of the participants from time to time (Yıldırım & Şimşek, 2016). The classification of the qualitative data to be obtained within the scope of the research was made on the basis of the categories present in the literature, which include the perception of child in history/societies. The quantitative data on views of the mothers regarding the self-regulation skills of their children and the analysis of these variables within the context of the meaning attributed to the concept of child were performed by using SPSS 21 package program.

3. Findings

3.1. Findings Regarding the Meanings That the Mothers Attributed to the Concept of Child

The first sub-problem in the research was determined as “What meaning do mothers who have children in the pre-school period attribute to the concept of child?”. The meanings that the mothers attributed to their children within the scope of this sub-problem are presented in Table 1.

Table 1: The meaning that the participants attributed to the concept of child

The Meaning Attributed to Child	Number of People	Percentage
Investment Tool	136	% 45,8
Development	55	% 18,5
Property	41	% 13,8
Individual with Rights	33	% 11,1
Innocent	32	% 10,8
Total	297	% 100

As can be seen in Table 1, the definitions of the participants regarding the concept of child were collected under five categories. According to the literature, the categories were determined as little adult, sinner, property, investment tool, individual with rights, innocent, God-given, reflective, and development: However, during the analysis of the qualitative data, no statements were found regarding the categories of little adult, sinner, God-given, and reflective in the data sets obtained within the scope of the study. This situation is interpreted in the light of the relevant researches in the conclusion and discussion section of this research. The meanings attributed by the participants to the concept of child were investment tool (45.8%), development (18.5%), property (13.8%), individual with rights (11.1%), and innocent (10.8%), respectively. The category that ranked first in terms of the frequency of the meaning attributed to child by the participants was investment tool category, which involved 136 people.

It can also be noticed that the participants interpreted the concept of child as “investment tool” in the first place (45.8%) according to frequency. When the responses of the mothers in investment tool category were analyzed on the basis of sub-categories, it was determined that they interpreted the child as an investment for the future and a unifying factor for the family, initially as the psychological benefit that the child provided to the parent; whereas it was also determined that no statements were found in the data sets representing the economic contribution of the child to the family. “Psychological benefit” sub-category includes the child’s statements of positive moods for their parents, whereas “future” sub-category refers to the views regarding the child as the continuation of the family or the future of the country, “family uniting element” sub-category includes the ideas of seeing the child as an element that holds the parents together and makes the family a real family. While defining the child, the statements such as “It is the guarantee of our future.” (Mother88) and “Fruit” (Mother42) can be given as examples of interpreting the child as an investment for the future. The statements like “child is the basis of the family.” (Mother20) and “making a family, making it a home” (Mother15) can be given as examples of interpreting the child as an element that unites the family. Besides, the statements such as “child is the most beautiful feeling in the world.” (Mother96) and “our source of joy, the one with whom we can spend every moment having fun and relieving stress...” (Mother157) can be given as examples of interpreting the child as an investment that provides psychological benefits.

It can be seen that the participants interpreted the concept of child as “a developing being” in the second place (18.5%) according to frequency. When the responses of the mothers in the category of development were analyzed on the basis of sub-categories, it was determined that the child was interpreted on the basis of “legal expression” and “period/age characteristics”. “Legal expression” includes the characteristics of the child and the barriers regarding the age of the child, as stated in the Convention on the Rights of the Child, whereas “period/age characteristics” includes the ideas that highlight the characteristics of the child during their development. While defining the child, the statement like “between 0-18 years old” (Mother6) can be given as an example of interpreting the child in parallel with the expressions found on the legal basis. Besides, the statement like “a child is a person who meets life, who is in the learning phase of life, and who has a high sense of curiosity and excitement.” (Mother2) can be given as an example of interpreting the child within the context of the developmental period/age characteristics of the child.

It can also be seen that the participants interpreted the concept of child as “property” in the third place (13.8%) according to frequency. When the responses of the mothers in the property category were analyzed, it was determined that the child was interpreted on the basis of the sub-categories entitled “paternalism”, “incompetent” and “needy”. “Paternalism” is based on the best interests of the child and includes making the best decision for the child, whereas “incompetent” includes focusing on the deficiencies of the child in different areas, which are thought to exist in comparison with the adult, rather than being needy towards the adult, and “needy” includes the ideas that emphasize the child’s dependence on adults. While defining the child, the statement like “being in need of protection and love” (Mother24) can be given as an example of interpreting the child as a needy being. Also, defining the child as “acting on their own impulses” (Mother51) can be given as an example of interpreting the child as an incompetent being. The statement like “I do not give right when they prefer harmful things. Because they are more valuable than their choices.” (Mother294) can be given as an example of interpreting the child on the basis of paternalism.

It is noticed that the participants interpreted the concept of child as “individual” in the fourth place (11.1%) according to frequency. The response given by Mother180 to the question of “Who is a child?” as “the child is an individual.” can be given as an example of “individual with rights” category, which included no sub-categories. It can also be noticed that the participants interpreted the concept of child as “innocent” in the fifth (last) place (10.8%) according to frequency. The response given by Mother177 to the question of “Are there any differences that distinguish the child from the adult?” as “There are so many differences, let me write a few of them. The child is not ungrateful; they respond when being loved. They are not fake; they tell what they think immediately. The child is pure, free from bad thoughts, and does not think about the evil of others.”, as well as her definition of the child as “innocent” can be given as examples of “innocent” category, which included no sub-categories.

3.2. Findings Regarding the Self-regulation Skills of the Children Within the Context of the Meanings That the Mothers Attributed to the Concept of Child

The second sub-problem of the study was determined as “What are the self-regulation skill levels of their children according to the views of mothers who have children in the pre-school period within the context of the meaning they attribute to the child?”. Within the scope of this sub-problem, the self-regulation skills of their children were analyzed according to the views of the mothers and separately in each of the five categories “investment tool, development, property, individual with rights, and innocent” by using descriptive statistical methods within the context of the meanings that mothers attributed to their children. Accordingly, the self-regulation skills of the children according to views of their mothers who interpreted the child as ‘investment tool’ are presented in Table 2.

Table 2. Self-regulation skills of the children according to the views of the mothers who interpreted the child as ‘investment tool’

The Meaning That the Mothers Attributed to Child	Self-regulation Skills of the Children According to the Views of the Mothers	N	\bar{x} / Arithmetic Mean	Sd (Standard deviation)	Median	Min. Value	Max. Value
Investment Tool	Attention	136	23,66	3,880	24,00	11	30
	Working Memory	136	22,19	2,537	23,00	14	25
	Prohibitive Control-Emotion	136	20,83	3,583	21,00	9	25
	Prohibitive Control-Behavior	136	12,88	3,147	13,00	4	20
	Total Score	136	79,5588	10,05154	81,00	44	100

When the self-regulation skills of their children were examined according to the views of the mothers who interpreted the child as ‘investment tool’, it was determined that the highest mean score was in Attention sub-dimension (\bar{x} =23.66), while the lowest mean score was in Prohibitive Control-behavior sub-dimension (\bar{x} =12.88). In addition to these findings, when the self-regulation skills total score was examined, it could be seen that the self-regulation skills of their children according to the views of the mothers who interpreted the concept of child as ‘investment tool’ were high (\bar{x} =79.5588).

The findings regarding the self-regulation skills of the children whose mothers interpreted the child as ‘development’ are given in Table 3.

Table 3: Self-regulation skills of the children according to the views of the mothers who interpreted the child as ‘development’

The Meaning That the Mothers Attributed to Child	Self-regulation Skills of the Children According to the Views of the Mothers	N	\bar{x} / Arithmetic Mean	Sd (Standard deviation)	Median	Min. Value	Max. Value
Development	Attention	55	23,93	3,839	24,00	11	30
	Working Memory	55	21,80	2,798	22,00	12	25
	Prohibitive Control-Emotion	55	20,20	3,439	20,00	12	25
	Prohibitive Control-Behavior	55	12,60	3,125	13,00	5	20

Total Score	55	78,5273	11,17016	78,00	48	100
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When the self-regulation skills of their children were examined according to the views of the mothers who interpreted the child as ‘development’, it was determined that the highest mean score was in Attention sub-dimension ($\bar{x}=23.93$), whereas the lowest mean score was in Prohibitive Control-behavior sub-dimension ($\bar{x}=12.60$). In addition to these findings, when the self-regulation skills total score was examined, it could be seen that the self-regulation skills of their children according to the views of the mothers who interpreted the concept of child as ‘development’ were at moderate level ($\bar{x}=78.5273$).

The findings regarding the self-regulation skills of the children whose mothers interpreted the child as ‘property’ are given in Table 4.

Table 4: Self-regulation skills of the children according to the views of the mothers who interpreted the child as ‘property’

The Meaning That the Mothers Attributed to Child	Self-regulation Skills of the Children According to the Views of the Mothers	N	\bar{x} / Arithmetic Mean	Sd (Standard deviation)	Median	Min. Value	Max. Value
Property	Attention	41	22,66	3,864	24,00	12	29
	Working Memory	41	21,83	2,597	22,00	16	25
	Prohibitive Control-Emotion	41	19,88	3,092	20,00	12	25
	Prohibitive Control-Behavior	41	11,73	3,091	12,00	5	19
	Total Score	41	76,0976	10,13115	76,00	48	94

When the self-regulation skills of their children were examined according to the views of the mothers who interpreted the child as ‘property’, it was determined that the highest mean score was in Attention sub-dimension ($\bar{x}=22.66$), whereas the lowest mean score was in Prohibitive Control-behavior sub-dimension ($\bar{x}=11.73$). In addition to these findings, when the self-regulation skills total score was examined, it could be seen that the self-regulation skills of their children according to the views of the mothers who interpreted the concept of child as ‘property’ were at moderate level ($\bar{x}=76.0976$).

According to the mothers who interpreted the child as ‘individual’, the findings regarding the self-regulation skills of their children are given in Table 5.

Table 5: Self-regulation skills of the children according to the views of the mothers who interpreted the child as ‘individual’

The Meaning That the Mothers Attributed to Child	Self-regulation Skills of the Children According to the Views of the Mothers	N	\bar{x} / Arithmetic Mean	Sd (Standard deviation)	Median	Min. Value	Max. Value
Individual	Attention	33	23,36	3,462	24	12	28
	Working Memory	33	21,64	2,447	22	16	25
	Prohibitive Control-Emotion	33	20,18	3,720	20	10	25

	Prohibitive Control-Behavior	33	13,52	3,032	14	5	20
	Total Score	33	78,6970	9,50817	78,00	57	96

When the self-regulation skills of their children were examined according to the views of the mothers who interpreted the child as ‘individual’, it was determined that the highest mean score was in Attention sub-dimension ($\bar{x}=23.36$), whereas the lowest mean score was in Prohibitive Control-behavior sub-dimension ($\bar{x}=13.52$). In addition to these findings, when the self-regulation skills total score was examined, it could be seen that the self-regulation skills of their children according to the views of the mothers who interpreted the concept of child as ‘individual’ were at moderate level ($\bar{x}=78.6970$).

The findings regarding the self-regulation skills of the children whose mothers interpreted the child as ‘innocent’ are given in Table 6.

Table 6: Self-regulation skills of the children according to the views of the mothers who interpreted the child as ‘innocent’

The Meaning That the Mothers Attributed to Child	Self-regulation Skills of the Children According to the Views of the Mothers	N	\bar{x} / Arithmetic Mean	Sd (Standard deviation)	Median	Min. Value	Max. Value
Innocent	Attention	32	23,78	3,190	24,50	17	30
	Working Memory	32	22,41	2,746	23,50	15	25
	Prohibitive Control-Emotion	32	20,22	3,526	21,00	10	25
	Prohibitive Control-Behavior	32	12,44	3,417	13,00	6	19
	Total Score	32	78,8438	9,43606	81,00	61	94

When the self-regulation skills of their children were examined according to the views of the mothers who interpreted the child as ‘innocent’, it was determined that the highest mean score was in Attention sub-dimension ($\bar{x}=23.78$), whereas the lowest mean score was in Prohibitive Control-behavior sub-dimension ($\bar{x}=12.44$). In addition to these findings, when the self-regulation skills total score was examined, it could be seen that the self-regulation skills of their children according to the views of the mothers who interpreted the concept of child as ‘innocent’ were at moderate level ($\bar{x}=78.8438$).

4. Conclusion and Discussion

This study aimed to determine the meanings that mothers attribute to the concept of child and examine the self-regulation skill levels of their children within the context of the meaning attributed to the child. Accordingly, the findings obtained within the scope of the research are discussed in the light of the relevant literature in this section.

4.1. The Meanings Attributed to the Concept of Child

Considering the five categories involving the meanings attributed to the child, it can be seen that the majority of the mothers interpret the child as “investment tool”. The statements of the mothers in the “investment tool” category are in line with Toran’s (2012) finding that they have a pragmatist approach that considers the benefit of the parent or the state, regardless of whether it is material or moral. Besides, this finding can be explained with the statements by Saracaloğlu et al. (2020) indicating that culture, time, and geography affect the meaning attributed

to child, by Senemoğlu (2010) reporting that perception is affected by prior learning and expectations, and by Erdiller Yatmaz et al. (2018) explaining that childhood develops by being affected by the cultural and historical perspectives of the society. This view, which is fed by the expectations from the child to ensure the continuation of the generation, to be a protector for the family or to unite the family when necessary, and to be used as a labor force when required, can be shown as a meaning that has been ongoing from the past to the present and is still attributed to the child by the great majority. Also, the meaning attributed to the concept of child can be explained by the statements of Karaoğlu (2019) reporting that the meaning attributed to the child varies with the culture, values, and development level of the society in which the child lives, and the pragmatist approach and obedience expectation that is dominant especially in traditional Eastern culture can also be found in mothers in Turkey.

The statements obtained from the participants regarding the meaning attributed to the concept of child and discussed under the category of “development” mean that various features of all kinds of developmental processes (such as being curious, asking many questions, and being extremely active) that the child experiences in the developmental period are taken into consideration (Akıncı Demirbaş, 2015; Çelik & Çat, 2018). It is determined that the mothers in the development category acknowledged the concept of child on the basis of the expressions found on the legal ground and the periodic characteristics. The fact that the mothers’ interpretation of the concept of child on the basis of their development is in the second place according to frequency can be considered in accordance with the view of New Childhood Sociology suggesting that the child may differ from adults in such matters as interests and needs, and that childhood should be regarded as a heterogeneous group instead of being limited to the ideal level (Demir Gürdal, 2013). Within the scope of this research, the statements included in the development category regarding the child are the statements based on the various characteristics of the children in the developmental process rather than comparing them with adults and finding deficiencies. Accordingly, it can be interpreted that the mothers participating in the research may have thought that children, just like adults, can have individual differences when it comes to their peers, and this might be associated with having an awareness that the child is not a “deficient” but a “developing” being. The fact that “development” category is in the second place in terms of frequency can be interpreted and discussed in various ways with the findings of various studies present in the literature (Akıncı Demirbaş, 2015; Kuyucu et al., 2013; Kıldan et al., 2012; Pesen, 2015; Uğur, 2018). For example, the findings obtained in the current study are not fully consistent with the findings obtained in the studies conducted by Akıncı Demirbaş (2015), Kuyucu et al. (2013), and Kıldan et al. (2012). Considering the findings of the study by Akıncı Demirbaş (2015) conducted with the students of the department of child development, it can be seen that the view that the child is a “developing being” ranks third last. Similarly, when the findings of the study conducted by Kıldan et al. (2012) with pre-service teachers are considered, it can be seen that the child is approached from a behavioral perspective by a much larger majority compared to the constructivist view in both the first and fourth grades; whereas when the findings of the study carried out by Kuyucu et al. (2013) with preschool teachers are considered, it can be seen that the view that the child is a developing being ranks eighth. In the current study, considering the fact that the participants are the mothers and the category of “development” is in the second place according to frequency, mothers, who are expected to have less conscious when compared to those with field education, are thought to have the conscious of child development more today as they have emphasized child development more than students, pre-service teachers and pre-school teachers in the field of child development. This inference can be more clearly grounded when evaluated together with the findings of Pesen’s research conducted in 2015. Indeed, in that study carried out with parents in 2015, the view of the parents regarding that the child is a developing being ranks seventh and the fact that this category ranks second today can be interpreted as an increase in the awareness of child development. The view that the awareness of child development has increased can also be supported by the findings obtained in the study conducted by Uğur (2018). While examining the views of grandmothers who support the care of their grandchildren on child and child raising practices, it is determined that grandmothers, who are expected to have more traditional approaches, have implemented practices in parallel with the views of field experts on child development and that they had not had the awareness that children should be supported in all areas while raising their own children. Accordingly, it is thought that this awareness of grandmothers, who are expected to exhibit more traditional approaches, is associated with the increase in the knowledge and practices of today’s mothers on the issue. In addition to all this information, the fact that the category of “development” is in the second place in terms of frequency can be explained by the incidence of not encountering the categories of “little adult”, “sinner”, and “reflective”, and the increase in the awareness of child development, which are regarded as the possible reasons for this fact.

The statements obtained from the participants regarding the meaning attributed to the concept of child and classified under the category of “property” mean that the child is seen as a property that belongs to the family or the state (Toran, 2012). Accordingly, it has been determined that the mothers participating in the research interpret their children as a being on whom they have high power and authority, in other words, as a property that belongs to them. It is also determined that the mothers in the category of “property” have had statements about the sub-categories of “incompetent” and “needy”, with the majority in the sub-category of “paternalism”, while explaining their views regarding the child. It is noted that the mothers, who consider the child as a property, have made statements centered on the parent while describing the children and that this category ranks third in terms of frequency. The fact that the mothers in the category of “property” are in the third place in terms of frequency can be interpreted in various ways with the findings of various studies present in the literature (Akgün, 2016; Akıncı Demirbaş, 2015; Kuyucu et al., 2013; Uğur, 2018). For example, the findings regarding the interpretation of the child as “property” differ from the findings of the studies in which the meaning attributed to the child by pre-school teachers, child development students, and pre-school teachers (Akgün, 2016; Akıncı Demirbaş, 2015; Kuyucu et al., 2013). The fact that children are mostly defined as “raw material to be shaped” and “passive receiver” by pre-school teacher candidates (Akgün, 2016), child development students (Akıncı Demirbaş, 2015), and pre-school teachers (Kuyucu et al., 2013) may be associated with the findings that can be included in the category of “property”, and this finding does not coincide with the fact that it is in the first place in the related studies but in the third place in the current study. This situation can be explained by the fact that with easier access to information, the understanding that the child is a developing being has increased and that the child is a being who just takes what is given without questioning as their understanding and interpretation skills are limited have decreased. When the relevant and current research findings are compared, the statements that can be categorized as property, though the order of the responses is different, and the incidence of different studies conducted with different participants, can be explained by the statements of Pesen (2015) emphasizing that the person’s views regarding the child are more associated with positioning the self in the life of the child (active or passive) rather than being a teacher or parent. Among these research findings, the fact that the category of “development”, which is ranked in the second place in terms of frequency, is followed by the category of “property”, can be explained by associating it with the study conducted by Uğur (2018). In the study of Uğur (2018), which has determined that grandmothers who support the care of their grandchildren are aware of child development and carry out practices supporting development, it is noted that the practices of grandmothers regarding this awareness are shaped according to the views of parents and grandmothers (which are thought to increase the family status or with the concerns about the future of the child) rather than the wishes and interests of children. This finding revealed by Uğur (2018) can be interpreted as the fact that the people who support the development of the child, despite having awareness of child development, prioritize their own views over the child or consider the best for the child on behalf of the child. Accordingly, the findings related to the category of “property”, which follows the category of “development” within the scope of the research, can be interpreted as the imposition of the views on the child by considering what is “the best” for the child on behalf of the child, even if the awareness about the development of the child is increasing. The fact that the category of “property” is ranked third in terms of frequency can also be interpreted by associating it with Turkey’s cultural structure, as it is associated similarly with the category of “investment tool”. The traditional perspective both in traditional Eastern cultures (Karadoğan, 2019) and in underdeveloped/developing countries (İnal, as cited in Toran, 2012), the expectation of obedience from the child (Canatan, 2011), and regarding the family more primary rather than the child in the Turkish culture, can be shown as of the reasons for this fact. Nonetheless, considering the frequency of the category of “property”, it can be said that this view still continues, albeit with a decrease when compared to previous years.

The statements obtained from the participants regarding the meaning attributed to the concept of child and classified under the category of “individual” mean that the child is regarded as an individual with their rights (Tezel Şahin & Cevher, 2007; Toran, 2012). accordingly, it is noted that the mothers participating in the research interpret the child as an individual with rights at a relatively lower ratio when compared to other categories. At this point, the meaning attributed to the child as an “individual with rights”, and the fact that this category is the second last according to frequency can be evaluated separately. When the findings of the studies by Akıncı Demirbaş (2015) and Kuyucu et al. (2013) are compared with those obtained in the current study, it can be interpreted that the meaning attributed to the child has changed as these studies do not reveal any findings regarding the meaning attributed to the concept of child as “individual”. Similarly, the findings of the study conducted by Arslan et al. (2017) with the participation of the mothers who have children in the pre-school period exhibit that

90% of the mothers who advocate that the child should be informed about their rights as an individual from an early age have left the question about children's rights unanswered, and the rest 10% just have limited knowledge about the issue. When the findings of the current study are compared with those of the study by Arslan et al. (2017), it can be concluded that in addition to the parents' views that the child is an individual, the responses given by the mothers to the interview questions about children's rights within the scope of the research and the ratio of responding these questions mean that they are more conscious about children's rights today. There are also studies in the literature on the interpretation of the child as an individual, which can be said to be in line with the findings of the current research (Erdiller Yatmaz et al., 2018, 2019; Uğur, 2018). For example, it is noted in the study by Erdiller Yatmaz et al. (2018, 2019) that pre-school teacher candidates have defined the child as an active being/individual, albeit with a small percentage, and in the study by Uğur (2018), it is revealed that the grandmothers who support the care of their grandchildren have more awareness of the fact that children are individuals compared to the process of raising their own children, and they have directed their practices accordingly. Therefore, it can be said that the ratio of evaluating the child as an individual has increased in the process.

The fact that the category of "individual" is in the second last place according to frequency does not show parallelism with the findings of the research carried out by Kağıtçıbaşı and Ataca (2005) and Ünal and Kök (2017). In the study by Kağıtçıbaşı and Ataca (2005), in which they examined the changing views on the values attributed to children and expectations from children between 1975 and 2003, the findings that the child's independence and self-confidence are emphasized instead of the obedience expectation in 1975 in terms of the desired characteristics of the child does not fully coincide with the findings of the current study. This situation, which is considered as an inconsistency between the findings, can be based on the adoption of the expectation of obedience regarding the child (in other words, the category of "property") more than the views that children are individuals in this study with the emphasis on the individuality of the child instead of obedience in 2003. In this respect, it can be interpreted as a remarkable finding that the emphasis on the individuality of the child is expected to continue increasingly since 2003, but it is not indigenized as much as the category of "property". Similarly, the findings of the study by Ünal and Kök (2017) that parents support the statements about the child as "individual" when describing them more than the categories of "future" and "source of happiness" do not coincide with the findings of the current study. Contrary to Ünal and Kök (2017), it is noted in this study that children are perceived as "future" and "source of happiness", in other words, as an "investment tool", and the category of "individual" ranks second last according to frequency. This inconsistency between the current study and the study of Ünal and Kök (2017) can be interpreted as that the parents may have thought that they should convey their views as they should be rather than what they actually think while presenting their views about the interview questions and that the study aims to examine the views of the parents regarding the needs, rights, and responsibilities of their children. Although there is a rank difference between the findings of the current research and those of the research by Ünal and Kök (2017), the fact that parents mostly punish their children when they do not fulfill their responsibilities and express that their expectations from the child is to be respected can be shown as a situation supporting the reason for this inference. Finally, the statements obtained from the participants regarding the meaning attributed to the concept of child and classified under the category of "innocent" mean that they highlight the innocence or goodness of the child as the point where they are separated from adults (Toran, 2012). The meaning attributed to the child as an innocent being can be explained by religious-based cultural factors. Indeed, Karadoğan (2019) states that beliefs affect the meaning attributed to the child; and considering that the majority of the society in Turkey has Islamic faith, Akın (2015) indicates that the child is considered a symbol of innocence by Muslims, and Stier and Kaplan (2019) suggest in their study with the participants from 24 countries that being religious directly affect the views regarding the child, all of which are thought to support this view.

Although the meaning attributed to the concept of child as an innocent being is a finding revealed as a result of this research and explained in accordance with beliefs, it is the last category in terms of frequency compared to other categories, which can be explained by the fact that religious-based values are losing their influence today. Another reason why this view, which has a history dating back to Turkish societies living in the previous centuries (Özdemir, 2002; Sağlam, 2002), is less adopted today can be explained by the existence of the perception that child is seen as innocent in the immediate family, as also advocated by Elkind (as cited in Eraslan, 2019), the reinforcement of this perception by the state, media and schools, and the change experienced in parallel with the changes in the family structure (Yurtsever Kılıçgün, 2015). Indeed, it can be said that today, the family structure

consists of the immediate family in which both parents work, and child care is shared with such institutions as day-care centers and kindergartens rather than a type of family in which only the father works, so the individuality of the child is given more significance (Dencik, 1989). Therefore, it can be said that when the current family structure (immediate family in which both parents take part in business life or single-parent works) is taken into account alone, the views and expectations of the child may have also changed. This situation can be associated with the changes in the family structure and daily life, as well as the easy access to information through media. Accordingly, together with the fact that the child is seen as an innocent being, it can be said that due to the emphasis on “developing being” becoming more prominent and due to such reasons as obtaining information about different beliefs through media and thinking about this information in parallel with the developing world, people are not limited to their own culture and beliefs and their existing beliefs and values have lost their former power. The study conducted by Ayçiçeği Dinn and Kağıtçıbaşı (2010), in which young people emphasized religious and traditional values less than their own parents in terms of the reasons for having a child and the meaning attributed to the child; the study conducted by Çelik and Çat (2018), in which as the age of the participants decreases, their adoption of religious and traditional education decreases; and the study by Mishra et al. (2005), in which urban youth in India support the traditional or religious values of the child to a much lesser extent within the context of the meaning attributed to the child, support this view. This view advocating that religious beliefs have lost their influence compared to the past can also be supported by the fact that the category of “God-given”, which is present in the literature, has not been found within the scope of this research.

In line with the findings obtained within the scope of the research regarding the meaning that the participants attribute to the concept of child, it is revealed that the participants have evaluated the child in a total of five categories as investment tool, development, property, individual with rights, and innocent, respectively; and it is also noted that the categories of “little adult”, “sinner”, “God-given”, and “reflective”, all of which are present in the literature, are not among the meanings attributed to the child by the participants. The fact that no statements regarding the category of “little adult”, which is present in the literature but not found in the data sets, are revealed as a result of the analysis means that the related findings are not in parallel with the findings of the study by Ayyıldız and Akardaş Karataş (2020) regarding the expression of “little human”. The expression of “little human”, which can be considered under the category of “little adult”, can be divided into two forms and explained, as Ayyıldız and Akardaş Karataş (2020) also stated in their studies, as “dwarfism” in science or as a point of view encountered until the 17th century. The fact that this expression, which can be considered under the category of “little adult”, is not found in this study can be explained by the fact that participating mothers are much more conscious about the development of their child, considering that “development” is the second most common category in the findings related to the meaning attributed to the concept of child. Moreover, the fact that no statements regarding the category of “sinner”, which is present in the literature but again not found in the data sets, are revealed as a result of the analysis can be based on the fact that the mothers have knowledge about the developmental processes of their children, as well as the culture and beliefs dominant in the society. This can be explained by the fact that the category of “sinner” is not a perspective possessed much by Muslims (Akin, 2015) and that the category of “innocent” is an accepted category, although it is expressed less frequently than the other four categories within the scope of the research. Considering Piaget’s view that children under the age of six do not have rules (Senemoğlu, 2010), this situation can also be explained by the fact that the child’s inability to make sense of concepts such as “property” or “lie” or their “egocentric” perspectives do not make them bad, but, on the contrary, is considered as a developmental characteristic today.

The fact that no statements regarding the category of “God-given” are revealed as a result of the analysis can be explained by the findings of the study conducted by Mishra et al. (2005) that despite their belief that the child is a being that will save the parent from moral debts, the urban and young generation living in India do not attach much importance to this situation. Accordingly, the findings obtained from the research carried out in India in 2005 can be interpreted as a situation in parallel with the change in the evaluation of the child on the basis of religious values by the young population, even though the basis of belief in Turkey and India differ from each other. Similarly, this situation can be explained by the fact that people have begun to move away from belief-based views due to the developments in both science and technology and other areas, all of which influence social life and thinking styles. Finally, the fact that no statements regarding the category of “reflective” are revealed as a result of the analysis does not show any parallelism with the findings of the research regarding the attribution of the concept of child as a reflective being in the literature (Akıncı Demirbaş, 2015; Kuyucu et al., 2013; Pesen, 2015). This situation can

be explained by the fact that the child may be interpreted as someone who has the ability to understand and interpret thanks to the developments in child development and easy access to related information, rather than being interpreted as a being that reflects only what they see, just like a mirror, a robot or eyes. As another interpretation, the fact that the categories revealed within the context of the meaning attributed to the concept of child in the literature are not found within the scope of this research can be explained by the sociological changes (changes in the family type in parallel with the changes in the cultural structure and developments in the field of technology, as also mentioned previously in the literature) experienced over time.

4.2. Self-regulation Skills of the Children within the Context of the Meanings That the Mothers Attribute to the Concept of Child

When the self-regulation skills of the children, whose parents interpret the concept of child under 5 categories as “investment tool”, “development”, “property”, “individual”, and “innocent”, are examined, it is determined that there are differences between the groups according to the categories of the meaning that the parents attribute to the child. These differences in children’s self-regulation skills within the context of the meaning that mothers attribute to the child are found to be high only in the category of “investment tool”, and it is noted that the children in the other categories have moderate level of self-regulation skills. Accordingly, it is thought that the meaning attributed to children may have affected children’s self-regulation skills in different ways, and it is considered that it would be more appropriate to interpret all the categories related to the meaning attributed to the child separately.

4.3. Self-regulation skills of the children whose mothers interpret them as “investment tool”

Considering the self-regulation skills total scores, it can be seen that the self-regulation skills of the children, whose mothers interpret them as “investment tool”, are at a high level according to the views of the mothers. This finding can be explained by interpreting the relationship between the characteristics of the investment tool category and the role assigned to the child, the importance given to social harmony, supportive parental activities, and the returns of self-regulation skills. Among the categories, the fact that the self-regulation skills of the children who are perceived as “investment tool” are solely high can be interpreted by associating the roles assigned to the child with its effects on the child’s behaviors. The findings of the study by Erbil (2016) revealing that the perceptions and expectations regarding the children will determine the roles assigned to them, the opportunities to be provided, and the relations to be established with them, and thus will affect their lives significantly, as well as the parents’ expectations from the child (Bayındır, 2016; Mischel, 2016) and the expectations of the social environment in which the child is involved (Ertürk, 2013; Öztürk & Özyürek, 2018) will affect the child’s self-regulation skills can all be considered as a situation in line with the finding of the current study. This finding can also be interpreted within the context of the basis of the investment tool category and the special importance given to social harmony. This category, in which the child is expected to please other people by prioritizing the expectations of others and it is important to behave appropriately for others, can also be specified as the group in which social harmony is deemed most important. In this regard, this finding can be explained by the connection between the importance of self-regulation skills in ensuring social harmony (Bayındır, 2016; Bayındır & Ural, 2016; Ertürk, 2013; Tekin, 2018) and the importance given by the people who interpret the child as an investment tool to the compliance with social rules. Among all the groups, the fact that children who are perceived as “investment tool” only have a high level of self-regulation skills, as well as the expectations from the child, can be interpreted by evaluating the effect of these expectations on the child’s self-regulation skills (Ertürk, 2013; Bayındır, 2016; Mischel, 2016; Öztürk & Özyürek, 2018) together with the education of children shaped to be the outcome of the investment made in them. Indeed, it can be said that the parents who raise their children in accordance with the purpose they want their children to adopt (to be the bright future of the country, to provide psychological contribution to parents, etc.) may attach more importance to supporting the development of their children accordingly. The statements that the pre-school period is the most open period to external influences (MEB, 2013), the child’s control of impulses and emotions is supported by social-emotional development (Tekin, 2018), and the routines provided by parents support the child’s self-regulation skills (Kopp, 1982) are thought to support this inference. Finally, this finding can be explained by evaluating it with the parallelism between the returns of self-regulation skills and the expectations from the child interpreted as an investment tool. When the returns of self-regulation skills and the content of the investment tool category are examined together, it is seen that there are great similarities in the basis of both and that the returns of self-regulation skills seem to be the characteristics not only parents but also society

would like their children to have. These similarities can be exemplified by the sub-categories of the investment tool category and the social or individual returns of self-regulation. For example, the view that the child is an investment in terms of the psychological benefits they will provide to the parent can be interpreted by associating with the returns of self-regulation in terms of increasing creativity, social skills, and academic achievement; and the view that the child is an investment for future can be interpreted by associating with the returns of self-regulation in terms of having socially approved and even exemplary features. When the connection between the psychological benefits that the child will provide to the parent and the returns of self-regulation are considered with a broader perspective, it can be said that there is a significant connection between the returns of self-regulation like obeying the rules, exhibiting positive social behaviors, being self-confident, having high academic achievement and increased empathy skills and the positive characteristics of children that enable the parent to be happy or be boasted. Indeed, an academically or socially successful child can be a source of pride or happiness for the family, and with high empathy skills, the child can understand the parents better and respond to their expectations more easily. Parallel to the psychological benefits provided by the child, the fact that the child is the common being that the family is proud of, as well as that the child is seen as a unifying factor for the family are also thought to be associated with such returns. When the connection between the interpretation of the child as an investment for the future and the returns of self-regulation is considered with a broader perspective, it can be said that there is an important correlation between both the social and individual returns of self-regulation and the meaning attributed to children as support for their family in the future or the future of the country. It can be said that a child who takes responsibility/fulfills their responsibilities and who experiences fewer problems regarding the use of money can be the family's future care provider or economic investment. The low rate of addiction, crime, and obesity, but the high rate of being ethical in business and social life can reduce the burden of the state and enable the country to respond more easily to future expectations. Thus, the statements that self-regulation is a key point for the formation of social life and the success of society (Polnariiev, as cited in Fındık Tanrıbuyurdu & Güler Yıldız, 2014; Posner & Rothbart, 1998) and that self-regulation is a very important tool for ensuring peace and cooperation among people (Eisenberg & Wang, as cited in Ertürk, 2013) are also thought to support this view. To summarize, considering all the returns mentioned above, this view, which varies from the psychological benefit it will provide to the parent to the future of the state but unites on the same basis, may be deemed more important, and therefore more adopted, than the other categories by the families who interpret the child as an investment tool.

4.4. Self-regulation skills of the children whose mothers interpret them as “development”

Considering the self-regulation skills total scores, it can be seen that the self-regulation skills of the children, whose mothers interpret them as “development”, are at moderate level according to the views of the mothers. The fact that the self-regulation skill levels of the children who are interpreted as a developing being are at moderate level can be interpreted by associating it with that development is in the second place in terms of frequency within the context of meaning attributed to children in the current study. It is thought that both the contemporary approaches such as the New Childhood Sociology and the attention paid to the differences between children by the experts in the field of child development may have influenced this situation. As known, children are a heterogeneous group with different characteristics (Demir Gürdal, 2013); and as emphasized in the basic principles of pre-school education (MEB, 2013), there are individual differences in the development process. When these statements are evaluated together with the fact that the development category is in the second place in terms of frequency in the findings regarding the meaning attributed to the concept of child, it is thought that mothers are aware of individual differences. It is also considered that thanks to having this awareness, mothers do not pressure their children regarding the development of self-regulation skills or the development of other skills, and they can appreciate that their children have an average skill level according to the normal course of development.

4.5. Self-regulation skills of the children whose mothers interpret them as “property”

Considering the self-regulation skills total scores, it can be seen that the self-regulation skills of the children, whose mothers interpret them as “property”, are at moderate level according to the views of the mothers. The fact that the self-regulation skill levels of the children who are interpreted as property are at moderate level can be interpreted by associating it with the characteristics of the property category, the effect of the role assigned to the child on the behavior, and the results of the relevant research. The category of property can be explained as a kind of approach in which the expectations regarding the child are imposed by ignoring the willpower of the child.

Therefore, it is thought that it may have prevented the child from regulating their emotions, behaviors, and thoughts in an internally controlled manner by influencing the fact that they become externally controlled individuals. The fact that the self-regulation skill levels of the children who are interpreted as property are at moderate level can be interpreted as having affected the child's evaluation of the self as a passive and not self-regulating being by influencing the expectations regarding the child and the roles assigned to the child. Thus, it can also be said that the decrease in children's self-belief and desire to regulate their behaviors with an intrinsic motivation may have affected their self-regulation skills to remain at a moderate level. Indeed, when the self-regulation total mean scores of the children are examined within the context of the meaning attributed to the child are considered, it can be noticed that the lowest score belongs to the children who are interpreted as "property". Accordingly, the fact that the children, who are interpreted as property, have lower self-regulation scores compared to other groups, is considered as a situation that can be explained by their acceptance of this situation as a result of the impositions they are constantly exposed to and by the decrease in their belief in themselves. The fact that self-regulation skills are at moderate level within the context of interpreting the child as "property", with a lower mean score compared to all the other groups, can be evaluated by examining them together with the relevant studies. For example, the findings of the study conducted by Olson et al. (as cited in Faber, 2002) revealing that the children of parents with authoritarian-strict and normative attitudes have problems in regulating their thoughts, emotions, and behaviors can be associated with the category of property, which includes the views regarding having high authority and power over the child. Similarly, this finding of the current study can be evaluated in parallel with the findings of the study conducted by Bayındır (2016) stating that having an attitude of the mothers expecting obedience from their children works against the children's self-regulation scores; and also with the findings of the study conducted by Uykan and Akkaynak (2019) revealing that their children's self-regulation skills progress negatively when parents have an authoritarian attitude. Furthermore, the statements of Yurtsever (2009) emphasizing that the control and freedom in the child's behavior change in accordance with the parental attitude are also thought to support this inference. In this regard, it can be said that the parent's expectation of obedience or having an oppressive attitude in the category of "property" may have affected the children in terms of having moderate level of self-regulation skills.

4.6. Self-regulation skills of the children whose mothers interpret them as "individual"

Considering the self-regulation skills total scores, it can be seen that the self-regulation skills of the children, whose mothers interpret them as "individual", are at moderate level according to the views of the mothers. The fact that the self-regulation skills of the children, which are thought to be required for individuals to stand upon their own feet within the context of interpreting the child as an individual, is deemed as an unexpected finding within the scope of this research. The findings that the self-regulation skills of the groups other than the investment tool category are at a more moderate level can be explained by associating with the high level of care and protection attitudes of the parents in all categories. As also known, the family is the place where the child first begins to interpret the relationship within the family, as well as many other situations, and the child does not have any other examples that they can compare this situation observed for the first time. For this reason, the family infects the child with various traditions or attitudes, and despite the fact that the child has the freedom to choose, they shape their thoughts, emotions, and behaviors at least by being influenced by the first experiences they have had within the family for a long time (Eraslan, 2019). Accordingly, the fact that the adoption of care and protection attitudes due to the age group of children and the insecurity of parents regarding the environment is at high level can be explained by the familiarity with the attitudes that children should be cared for and protected. It is also considered that the fact that the children are influenced by their first experiences as a result of the decisions made "for their own sake, for their own benefit" may have affected their self-regulation skills, which involve directing their own behaviors, to be at a more moderate level.

4.7. Self-regulation skills of the children whose mothers interpret them as "innocent"

Considering the self-regulation skills total scores, it can be seen that the self-regulation skills of the children, whose mothers interpret them as "innocent", are at moderate level according to the views of the mothers. The fact that the self-regulation skills of the children are at moderate level within the context of interpreting the child as innocent can be explained by associating it with the religious influences and the expectations from the child shaped within the framework of these influences. The view that the child is innocent is based on religious beliefs, as also

mentioned in the previous sections. According to the Islamic belief, which can be considered as the basis of the “innocent” view in Turkey, together with the fact that the child is not responsible for their own behaviors until they become “examinant” or they reach “the age of distinction” (seven years old), they do not have “criminal responsibility” (Saltekin, 2019). In Islam, the child is not deemed responsible for their behaviors until they have the power to distinguish between good and bad (TDK (Current Turkish Dictionary of Turkish Language Association), n.d.) or until they reach the age of seven. When the belief that the child is not responsible for their own thoughts and behaviors before the age of seven according to Islam and that the children of the mothers participating in the current research are between the ages of 5 and 6 are considered, this situation can be understood more clearly. Accordingly, it can be said that the mothers, who interpret the child as innocent, may not have any expectations and practices for regulating the child’s emotions, thoughts, and behaviors as an innocent being who is not yet responsible for their actions.

5. Recommendations

In the recommendations section of the current research, the recommendations for parents, teachers, and researchers are presented in accordance with the results of the research.

5.1. Recommendations for Parents and Teachers

In the light of all the findings obtained within the scope of the research, it is recommended that all the shareholders regarding the education of the child may;

- participate in trainings on the rights of children and read various sources accordingly in order to be aware of the fact that children are individuals with their rights,
- pay attention to and regulate the expressions they use and the attitudes they possess by avoiding the statements that the child is insufficient, needy, and can be shaped as desired, especially in the family and pre-school education institutions where children have their first experiences,

5.2. Recommendations for Researchers

In the light of all the findings obtained within the scope of the research and in accordance with the limitations of the study, it is recommended that the researchers that will carry out research in the field may;

- conduct such a study, whose sample group involves only mothers, by including fathers in the sample,
- conduct studies in which the compatibility between the meanings that the parents attribute to the child, as well as the variables analyzed in the current study are examined with the participants involving both mothers and fathers,
- study similar research topics by determining different groups with and without parents as the sample.

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Exploring the Prospective Teachers' Views about Writing Topic Selection and Their Writing Skills

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Abstract

The study aims to reveal the students' -the prospective teachers for this study- the views about writing topic selection and their writing skills. This study employs phenomenological qualitative research design. The study group consists of forty prospective teachers studying in the Turkish Language Teaching program. The reason why they were selected as the study group is that they completed the written expression and writing training courses, and their experiences in writing were optimum. In the analysis of the data, the content analysis method and NVivo 11 Pro program were used. The first finding from the study was about writing topic selection. Four categories emerged from the prospective teachers' views regarding writing topic selection: disciplines, emotions, currency, and individuals. The most cited main category among these is emotions. The emotions main category is further divided into subcategories: romance, love, longing, misery, loneliness, joy of life, breaking up, happiness, fear and motivation. The main category of discipline ranked second following emotions. This theme encompassed the categories of education, language, literature, philosophy and history. The prospective teachers mostly wrote about education and literature. The main category of currency was split into two categories, i.e. social problems and current events, while individuals main category into four: family, friendship, your own life and people. Five categories emerged from the prospective teachers' views regarding writing skill: psychology, competence, creation, expression and benefit. The most cited categories were psychology and expression.

Keywords: Writing Topic Selection, Writing Skill, Views, Prospective Teachers

1. Introduction

Writing, in its simplest form, is the process of using letters or symbols to communicate our thoughts in a readable form. According to Warnock (1983), writing is a complex process. He/she asserts that one of the terms that plays an important role in the debate on writing is 'development'. Dyson (1983) also emphasizes the developmental role of writing and states that the move from spoken to written language is the result of an undocumented developmental progress in the preschool and early school years.

There are different definitions of writing explained by some researchers. For example, Stein (1983) offers two definitions of writing. One common definition assumes that the writer always clearly communicates his/her intentions and creates a text that is easy for the reader to understand. Here there is a coherent organization to the written work, with a general plan evident throughout the structure of the text. A second definition of writing focuses on learning and the reorganization of existing knowledge in the writer's head. Here the writer is believed

to use existing knowledge to generate new information, which is then incorporated into existing information structures. Throughout this entire process, a new organization of existing information is usually constructed.

Defazio et al. (2010) also approves Stein's (1983) second definition. According to Defazio et al., writing is a skill that grounded on the cognitive domain. It involves learning, comprehension, application and synthesis of new knowledge. Flower and Hayes's (1981) cognitive process theory, on the other hand, rests on four key points about writing:

1. Writing is best understood as a set of distinctive thinking processes which writers orchestrate or organize during the act of composing.
2. The processes of writing are hierarchically organized, with component processes embedded within other components.
3. Writing is a goal-directed process. In the act of composing, writers create a hierarchical network of goals and these in turn guide the writing process.
4. Writers create their own goals in two key ways: by generating goals and supporting sub-goals which embody a purpose; and, at times, by changing or regenerating their own top-level goals in light of what they have learned by writing.

It is a well-known fact that writing is a goal-oriented process. Establishing the goal is critical to writing. Tompkins (1982) also one of the researchers that places great emphasis on setting a goal in writing. She attempts to consider writing from children's perspectives and suggests 7 seven reasons why children should write stories:

- 1: To entertain
- 2: To foster artistic expression
- 3: To explore the functions and values of
- 4: To stimulate imagination
- 5: To clarify thinking
- 6: To search for identity
- 7: To learn to read and write

Flower and Hayes (1981) also focus on the writer's goals and knowledge of the topic. They further assert that the writer's goals and knowledge of the topic actively compete for the writer's attention. For Flower and Hayes, each one wants to govern the decisions and choices made next.

In certain writing situations, writers place great emphasis on reconstructing and reorganizing their own knowledge about a topic or event (Stein, 1983). Because just as a title constrains the content of a paper and a topic sentence shapes the options of a paragraph, each word in the growing text determines and limits the choices of the next step (Flower, Hayes, 1981).

Cohen (2013) talks about a popular free writing activity. This activity involves students writing as much as possible on a topic in a certain period of time. An appealing component of this type of activity is the topic selection either by the teacher or by the student. Atwell (1985) contends that students should need to select their topics to help them develop an interest in writing. McKenna, McKenna (2000) again asserts that many theorists have concluded that children who select their own topics write better than those who write on teacher-assigned topics.

According to Stein (1983), writing topic selection is very important. This is because when a writer has the freedom to select a topic, usually a topic of interest is chosen. An interesting topic is one where the writer has a general curiosity about some series of events or about a phenomenon in particular. Usually, some information has already been acquired about a topic, so that the writer has specific questions about the nature of a phenomenon and sets out to seek an explanation for the events.

In the literature, there are a great many studies that have been dedicated to investigate writing topic selection. For example, Aslan (2019) attempts to determine writing topics and prepared writing guidelines for secondary school students based on the literature review and expert opinions. Kurudayıoğlu & Karadağ (2010) examine the written expressions of primary school students from 1st to 8th grade as regard to topic and topic selection. Peterson (2000) again tries to determine the preferred story (narrative) topics of fourth, sixth and eighth grade students. In a similar

vein, Shippen et al. (2007) examine the preferred writing topics of urban and rural secondary school students. Arıcı (2009), on the other hand, aims to determine the preferred writing topics of the prospective Turkish teachers.

Apart from these studies, there are also some others focusing on different aspects of writing. For example, Kellogg (1987) examines the effect of knowledge of the topic on the processing time and cognitive effort spent in writing. Ülper & Çeliktürk Sezgin (2019) aims to determine the writing habits of the prospective teachers. Bonzo (2008) examines whether the topic selection in foreign language teaching affects fluency in writing. Dickinson (2014), Sponseller & Wilkins (2015), on the other hand, try to retest Bonzo's (2008) hypothesis on whether topic selection in foreign language teaching affects fluency in writing.

The literature review shows that a majority of these studies focus on exploring the purpose of writing and writing topic selection at different education levels (e.g. secondary school, university and EFL students, etc.). In these studies, the students either select their own topics or they write on teacher-assigned topics. But, there is almost no study exploring the students' views about writing. The students' views about topics are of great importance to writing. There are several steps that the teacher can take to promote student engagement in writing topic selection. One way to do this is that the teacher can discuss writing topics with the students in advance. In this way, it become possible to determine agreed writing topic. Or the students can speak on a topic of their own choosing. These practices can absolutely help students to improve their writing performances as well as motivation in writing. With this in mind, the study aims to reveal the students' -the prospective teachers for this study- the views about writing topic selection and their writing skills. Therefore, the aim of the study is twofold. Firstly, it purports to explore which writing topics the students select and the reasons why they choose them. Secondly, it attempts to examine in depth the prospective teachers' views about writing. Specifically, the study seeks answers to these questions:

1. What topic(s) do the prospective teachers want to write about? Why?
2. What are the prospective teachers' views about writing?

2. Method

This study employs phenomenological qualitative research design. According to Creswell (2007), phenomenological research design provides a deep understanding of a phenomenon or concept experienced by several other people. According to this definition, what phenomenologists focus on is identifying common characteristics of all participants who experience a phenomenon.

The study discusses the prospective teachers' views on various aspects of writing (e.g. topic selection, their writing skills etc.). So, homogeneous sampling method, one of purposeful sampling methods, is thought to best fulfill the aim of the study. As Patton (2002) explains, in-depth information about a certain subgroup may be needed in a program with many different types of participants. The study group consists of forty prospective teachers studying in the Turkish Language Teaching program. The reason why they were selected as the study group is that they completed the written expression and writing training courses, and their experiences in writing were optimum. Initially, in order to reveal how the participants selected writing topics and what they thought about writing skills, the researcher drafted six open-ended questions. Among these, two open-ended questions were finally structured. In order to ensure the content validity of the questions, four faculty members (experts) working in the field of Turkish Education were consulted on the issue. Based on the feedback received from experts, two of the questions, among six open-ended questions, were chosen. The questions are as follows:

1. What topic(s) do you want to write about? Why?
2. What are your views about writing?

Before the interview, three students were asked to check whether the questions are comprehensible or not, and it was observed that there was no problem in understanding the questions. As there was no problem with the questions, the researcher started to collect data.

The participants produced a 50 page document that showed the answers they provided. In the analysis of the data, the content analysis method and NVivo 11 Pro program were used. The sentences of the prospective teachers were written without any changes. The sentences were coded one by one, and codes of the same type were grouped into themes. The main consideration was to make sure that any data collected was consistent with the codes and themes.

So, the study made use of participants' own words, rather than interpretation of the data. As stated by Yıldırım and Şimşek (2011), reporting the real and detailed data is an important criteria for validity.

In order to ensure the reliability, on the other hand, the same data was coded by a different researcher. The reliability percentage was calculated according to the compliance percentage formula [Reliability=Number of agreements/Number of agreements+disagreements (Miles & Huberman (1994)]. The reliability value was found as 0.96 for writing topic selection, and 0.93 for the views about writing.

3. Results

In this section, the findings related to the first and second questions of the study are given.

3.1 Findings Related to the Writing Topic Selection

The prospective teachers' preferences or views for writing topics were split into four main categories: disciplines, emotions, currency, and individuals. The main categories, categories and subcategories for writing topic selection are presented in Figure 1.

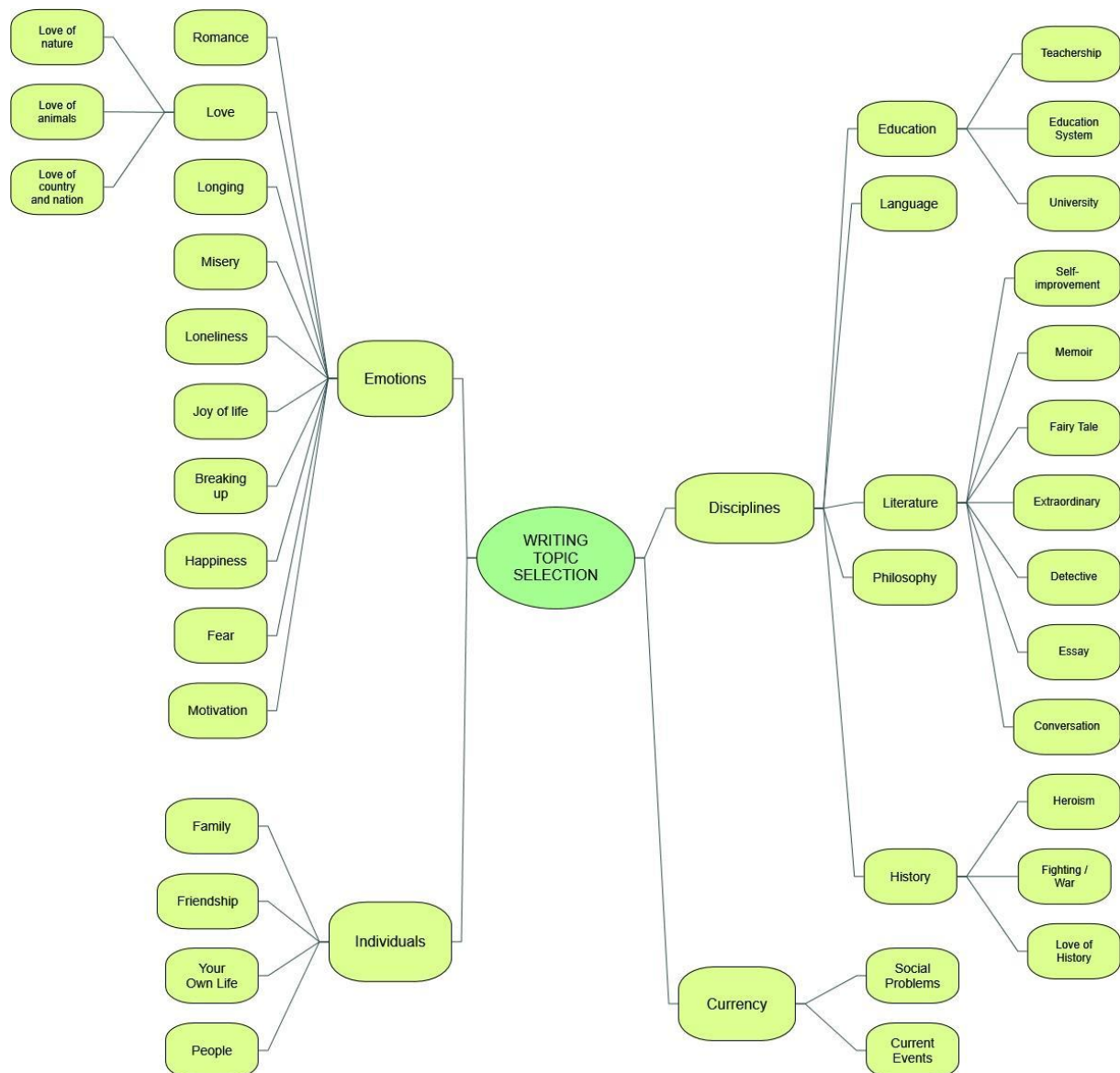


Figure 1: Main category, category and subcategories for writing topic selections

Table 1: Categories, subcategories, frequency and reasons distribution for the main category of disciplines

Category (f)	Subcategory (f)	Reasons
Education (9)	Teachership (5)	Becoming a teacher Being related to his/her profession
	Education system (3)	Informing people what will happen in the future Examining the problems in the education system
	University (1)	Having a desire to have professional competence
Language (2)		Protecting and developing the language Encouraging professional development
Literature (8)	Self-improvement (1)	Covering every area of life
	Memoir (1)	Portraying literature and human relation
	Fairy tale (1)	Gaining knowledge by researching
	Extraordinary (1)	Being interested in that subject matter
	Detective (1)	Being Interpreted differently by everyone
	Essay (2)	Being useful for literature and culture
	Conversation (1)	
Philosophy (2)		Developing imagination Developing critical thinking skills Making someone think Being interested in that subject matter
History (4)		Getting information Introducing state dignitaries Expressing effectively yourself Being interested in that subject matter Raising awareness about our past history
	Heroism (1)	
	Fighting/war (2)	
	Love of history (1)	

Some parts of the prospective teachers' views regarding writing topics and the reasons for choosing them in the main category of disciplines have been presented in the form of direct quotation:

"I would like to write about teachership. Some writing topics about this may include: How to become a good teacher? How should teachers educate themselves so that they can raise students who are useful to society and humanity." (2)

"I want to write on topics regarding education and training. Because we are prospective teachers and I want to have enough knowledge and competence in these subjects." (6)

"I would like to write more about philosophical topics because they make us think and develop our imagination world. It also develops our critical thinking skills." (22)

As is seen, prospective teachers expressed views about various emotions and the reasons for them. Since the reasons for emotions are repeated in almost every emotion, it would be appropriate to summarize the reasons for emotions in a holistic summarized table.

Table 2: Categories, subcategories, frequency and reasons distribution for the main category of emotions

Category (f)	Subcategory (f)	Reasons
Romance (4)		Expressing effectively yourself Expressing emotions is easy
Love (9)	Love of nature (4)	Showing cues about emotions
	Love of animals (1)	Sharing your emotions/feelings
	Love of country and nation (4)	Being Interpreted differently by everyone
Longing (5)		Being the most fundamental writing topics
Misery (2)		Making someone realizing his/her inner world
Loneliness (2)		Being always with us

Joy of life (1)	Bringing good things to one's mind
Breaking up (1)	Making someone realizing his/her inner world
Happiness (2)	Being essential for life
Fear (1)	
Motivation (1)	

Here, some parts of the prospective teachers' views regarding the main category of emotions have been presented in the form of direct quotation:

"I would like to write about emotions and feelings. This is because these topics are open-ended. That is to say, you can write about whatever's on your mind: love, sadness, pain... These are open-ended topics and are interpreted differently by everyone. Again, as such concepts or emotions as love, loneliness, etc. make you realize your inner world and evoke your past experiences or memories, it is easier to write on those topics." (10).

"I would like to write about the joy of life and my loneliness. Because my loneliness is like a shadow that haunts me, we go everywhere with it." (15)

Table 3: Categories, frequency and reasons distribution for the main category of currency

Category (f)	Reasons
Social problems (8)	Becoming a teacher
	Not being indifferent
	Suggesting solutions
	Requiring further effort for recovery
	Dealing with those who will lead society
	Correcting incorrect information
Current events (5)	Being in the public interest
	Becoming interesting
	Attracting the public's attention
	Raising people's awareness
	Gaining different perspective
	Showing a willingness to find solutions
	Writing easily

As is seen, prospective teachers also want to write about social problems and current events apart from emotions and disciplines. Here, an example of the prospective teachers' views regarding the social problems and current events categories has been presented in the form of direct quotation:

"I would like to write about a current topic. In this way, I would attract the attention of a large part of society. This also can be useful to society. In addition to this, I would bring forward some new evidence to an event that happened recently. Thanks to this, awareness can be raised among people." (13)

Table 4: Categories, frequency and reasons distribution for the main category of individuals

Category (f)	Reasons
Family (5)	Being the most important thing in life
	Being the most important element in the society
Friendship (3)	Just learning its reality
Your own life (2)	Showing people that they are not alone
People (1)	Being interested in feelings, thoughts, behaviors

Here, an example of the prospective teachers' views regarding the individuals main category has been presented in the form of direct quotation:

"I can write about the problems I have experienced. As I have experienced these problems myself, I can write down my thoughts and offer solutions to people. In this way, I can make them feel better. I'm the only one who hasn't had these problems. That's why I can write about what I went through to prove that people are not alone. They can find a piece of themselves in my writing." (29)

3.2 Findings Related to the Views about Writing Skills

The prospective teachers' views about their writing skills were split into five main categories: psychology, competence, creation, expression and benefit. These categories are presented in Figure 2.

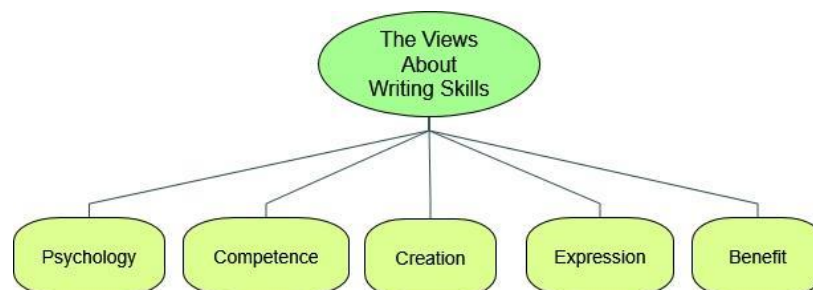


Figure 2: Categories regarding the views about writing skills

Table 5: Codes and frequency distribution for the category of psychology

Category	f
Giving the opportunity to be intentional with your writing	1
Not feeling lonely	1
Having a therapeutic effect	15
Staying with yourself	3
Being more effective than depression medications	1
Reducing mental fatigue	1
Feeling detached from the outside world	1
Feeling free	1
Blowing off steam	2
Reducing anger	1
Getting onto paper what you can't tell others	11
Nourishing your soul	1
Making yourself feel good	2
Being our most loyal friend	1
Feeling yourself happy	1
Clinging to life	1
Being main indicator of loneliness	1
Writing for pleasure	1
Being unable to control inner feelings	9

Here, some parts of the prospective teachers' views related to the codes in the theme of psychology again have been presented in the form of direct quotation:

"Writing is an action that cling people to life. If you say to a writer "don't write", this is equivalent to saying that "give up on life". A writer who cannot write is not expected to enjoy his life." (5)

"Writing means being alone with oneself. This is because it gives the opportunity to get onto paper what you can't tell others. So that it is more effective for some people than depression medications." (7)

"Writing means blowing off steam for me. That is to say, it can help in releasing negative emotions of my life." (12)

"Sometimes you can't cope with your emotions. But ultimately you find a way to express them. You pick up a sheet of paper and start writing. Writing therefore make you feel good and relaxed. When you feel the impulse "to get out of bed and write in your diary," you can't resist this impulse." (13)

"Thanks to writing, we can get away from the life that we find very hard and experience a purification of the soul." (21)

Table 6: Codes and frequency distribution for the category of competence

Category	f
Requiring a background knowledge	3
Requiring interpreting skill	1
Demonstrating the development of ideas	1
Being a sign of writability	1
Requiring a talent	1
Requiring imagination and experience	2
Having a rich vocabulary	1
Requiring thinking, idea, will	1

Here again some parts of the prospective teachers' views related to the category of competence have been presented in the form of direct quotation:

"Not everyone can write well. In order to write well, you need to have a sound knowledge and interpreting skill. Writing demonstrates the development of ideas. Therefore, it is an important sign of writability." (1)

"Writing is actually not as easy as it seems. In order for a person to write about any topic, he must first have a detailed knowledge of that topic. This is due to the fact that everyone can read a book in life, but not everyone has the necessary skills and imagination to write a book. Imagination and experience are as important as knowledge in writing." (32)

"Having a rich vocabulary directly affects our writing. When we use similar words in almost every sentence, we do not add any value to our writing. Good writing is not formed through writing a lot." (33)

Table 7: Codes and frequency distribution for the category of creation

Category	f
Writing grammatically correct and complete sentences	1
Requiring a set of rules to follow	3
Deciding what to write about	1
Trying to remember what you know about writing topic	1
Finding the source to learn more information	1
Being a planned activity	1
Having different purposes	1
Requiring attention and considerable time	1
Requiring a considerable time to develop good writing	2
Being able to write on every topic	1
Being hard	1
Consisting of interwoven relational components	1
Holding together the pieces of writing, i.e. introduction-body-conclusion paragraphs	1
Being able to write in every genre	1
Creating cohesion between words	1

Here again some parts of the prospective teachers' views related to the codes in the theme of creation have been presented in the form of direct quotation:

"Writing is not a random activity, but should follow a set of rules and entails clearly constructed sentences. Therefore, it requires a considerable time to develop good writing. Throughout this process, we improve ourselves and write better." (1)

"People can write about anything they want. Sometimes they write about for science, and at other times they write novels, stories and poems. The key point here is not what to write but to write whatever you want." (35)

"Writing is really so hard. This is because everything you write should be proper and be in connection with each other. In other words, the components of writing, i.e. introduction-body-conclusion paragraphs, should be held together and the connection between ideas should be evident." (39)

Table 8: Codes and frequency distribution for the category of expression

Category	f
Being the best way to express yourself	8
Getting thoughts and feelings onto paper	23
Speaking their writing	1
Getting into a flow state	1
Making the abstract concrete	2
Enabling to share experiences and ideas with other people	1
Giving a message to the reader	1
Engaging with the act of sharing	3
Being unpredictable and unknowable	1
Being the voice of reason and logic	1

Some parts of the prospective teachers' views related to category of expression have been presented in the form of direct quotation:

"As we speak, many thoughts and ideas come to our minds. But sometimes we can't convey it by speaking. This is where writing comes into play. I think writing is the best way to express oneself." (6)

"I can express myself better through writing. I can say what I couldn't say during the conversation or what I didn't think in writing". (10)

"Writing means getting one's thoughts and feelings onto paper." (27)

"Writing is actually putting down what you have on paper. In other words, it is a part of human condition to share things: thoughts, feelings, ideas, etc." (37)

Table 9: Codes and frequency distribution for the category of benefit

Category	f
Serving as a permanent record of our experiences, ideas and thoughts	13
Leaving a mark on the future	3
Reaching large audiences	1
Being a tool for cultural transmission	3
Sharing your writing with others	1
Being a way to appreciate thoughts	1
Being endless or infinite	2
Developing the world of thought	1
Enhancing self-assessment skill	1

Here again some parts of the prospective teachers' views related to category of benefit have been presented in the form of direct quotation:

"Writing serves as a permanent record of our thoughts. It enables people to reach a large audience, and makes it easier for one generation to pass on its experiences, ideas and thoughts to the next generation." (9)

"It is true that if you do not record what you think or experience, they will be absolutely forgotten in the course of time. 'The palest ink is better than the sharpest memory' is a proverb that is still relevant to us today. Therefore, writing down your thoughts and experiences is important. People die, thoughts are forgotten over time, but products or works last a long time." (18)

"If something is made up of verbal forms, there is no sufficiently durable permanence in it. The life of a word is as long as the life of the speaker. But if those words are got onto paper, they will not disappear." (24)

4. Discussion

This section is to interpret the prospective teachers' views regarding writing topic selection and their writing skills, and to discuss these findings with related studies in the literature.

4.1 Writing Topic Selection

The first finding from the study was about writing topic selection. Four categories emerged from the prospective teachers' views regarding writing topic selection: disciplines, emotions, currency, and individuals. The most cited main category among these is emotions. The emotions main category is further divided into subcategories: romance, love, longing, misery, loneliness, joy of life, breaking up, happiness, fear and motivation. The prospective teachers made references at most to the categories of romance, love and longing.

The main category of discipline ranked second following emotions. This theme encompassed the categories of education, language, literature, philosophy and history. The prospective teachers mostly wrote about education and literature. This may be due to the influence of the department in which they studied. Arıcı's (2009) study also reached almost the same conclusion. According to the study, the prospective teachers preferred to write especially about love, education, adventure, language/literature, history and politics. As is seen, the current study showed similarities in the categories of love, education, language, literature and history with Arıcı's study.

The main category of currency was split into two categories, i.e. social problems and current events, while individuals main category into four: family, friendship, your own life and people. The study also reached a similar conclusion with Peterson's (2000) study. In Peterson's study, five categories emerged: family/friends, feelings, natural world, supernatural, social issue. This finding showed that there is a similarity between those categories and the categories emerged from the current study, i.e. individuals, emotions and currency.

Shippen et al. (2007) reported that the main writing topics in view of secondary school students include current events, youth issues, politics, school, and celebrities. However, this finding was not consistent with the current study. Only one category was noted as overlapping, i.e. current events. This may be due to the age difference between the study groups. Because Shippen et al. (2007) asserted that when selecting a writing topic, the commonality of adolescence is interestingly much more important than the location in which the students receives education, i.e. urban and rural.

According to McKenna and McKenna (2000), these findings in favor of self-selected topics by the students did not result in better writing. Therefore, no matter how fascinating the concept was, letting students select their own writing topics was not the solution to their poor writing. While a student's prior knowledge of a topic was helpful, prior knowledge alone was never enough to enable students to produce good writing.

Apart from these studies, there are also some others delving into depth the effect of writing topic selection. For example, Bonzo (2008), Cohen (2013), Dickinson (2014), Sponseller & Wilkins (2015) showed that topic selection has a statistically significant effect on increasing writing fluency on foreign language learners. Stein (1983), on the other hand, stated that the writer's goals can change during the act of writing, and this is related to the amount of prior knowledge about a particular topic.

In fact, these findings are similar. Leaving the choice of what to write up to the students is important in prior knowledge exploitation. But not limited to this alone. There are some other steps that the teacher can take to promote student engagement in writing topic selection. One way to do this is that the teacher can discuss writing topics with the students in advance. In this way, it become possible to determine agreed writing topic. Or the students can speak on a topic of their own choosing. These practices can absolutely help students to improve their writing performances as well as motivation in writing.

4.2 The Views about Writing Skills

The second finding from the study was about the views regarding writing skill. Five categories emerged from the prospective teachers' views regarding writing skill: psychology, competence, creation, expression and benefit. The most cited categories were psychology and expression. The most occurring codes or reasons reported by the prospective teachers, on the other hand, were: "blowing off steams, getting onto paper what you can't tell others, being unable to control inner feelings," for the category of psychology; "getting thoughts and feelings onto paper" for the category of expression, and "serving as a permanent record of our experiences, ideas and thoughts" for the category of benefit.

For the creation category, prospective teachers reported some basic grammar rules and guidelines to create a text. These included: “writing grammatically correct and complete sentences, requiring a set of rules to follow, being a planned activity, being hard, consisting of interwoven relational components.” Similar findings also reached by Defazio et al. (2010). According to the study, writing may be arduous and even dreaded activity of attempting to get the thoughts onto paper while developing mastery over grammatical rules of writing, i.e. citation, spelling, grammar and format from the point of view of students. On the contrary, from the point of view of faculty members, writing entails more than adhering to grammatical rules. It also encompasses such skills as problem solving, creative inspiration, revision and reflection.

Ülper & Çeliktürk Sezgin (2019) aimed to determine the writing habits of the prospective teachers. The study found that student’s writing habits include: relaxation, love, self-expression, not forgetting, giving information to others, communicating, and creating. It is evident that these findings share similarities with the codes of the therapeutic nature of writing, being the best way to express yourself, and getting thoughts and feelings onto paper in the themes of psychology and expression in the current study.

When I asked about his/her thoughts about writing skills, one of my students said, “Thanks to writing, we can get away from the life that we find very hard and experience a purification of the soul. This is because we get our thoughts and feelings onto paper.” I came across these sentences when I analyzed the writings of the students after a semester. And I had a big shock because my student had ended his life at the end of the school year in which he had written these lines. What overwhelmed me, as I traced the writing of my students, was realizing how the life was so difficult and hard from the perspective of my student. But unfortunately, we were too late.

These findings from the study indicate that there are many ways self-selected topics may benefit students. All in all, it is benefited mainly from two aspects. These include the development of writing skills and psychological relaxation. Psychological relaxation, as stated by the students themselves, is extremely helpful for them especially during the adolescence period when sudden psychological and emotional changes take place. But not limited to this alone. There are also many more benefits that I can claim. For example, I experienced many times in my writing classes that a good communication can be established with introverted students through writing. The fact that writing is inescapable and important part of our lives is also approved by the authorities or experts. The authorities or experts recommend that people engage in writing first in the morning. The reason why they recommend writing above all other things is because it clears your feelings and thoughts, and enables you to start the day with a fresh mind.

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The Investigation of Gifted Students' Speaking and Writing Anxiety Level According to Some Variables

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Abstract

In this study, it is aimed to examine the speaking and writing anxiety levels of gifted students according to various variables. For this purpose, the study group consists of 50 volunteer students who continue their education in a Science and Art Center (BİLSEM) in Turkey and come to the school on the days of the study. The study was designed in the survey model and carried out according to the quantitative research method. In the study, the "Speaking Anxiety Scale" developed by Gündüz and Demir (2020) for secondary school students was used to determine the speaking anxiety of gifted students, and the "Writing Anxiety Scale for Secondary School Students" developed by Karakuş Tayşi and Taşkın (2018) was used to determine their writing anxiety. The data were analyzed using the SPSS 26 package program. For analysis, t-Test and One Way Anova Test, which is one-way analysis of variance, were used from parametric tests. As a result of the study, it was determined that the writing and speaking anxiety levels of the gifted students were moderate, and the students do not differ according to their gender, grade level, school type and BİLSEM program they are studying. In the study, it is suggested that more studies should be done on the speaking and writing anxiety of gifted students.

Keywords: Gifted Students, Speaking Anxiety, Writing Anxiety

1. Introduction

There are many situations that have an impact on people's lives. One of them is the anxiety they experience. According to Morgan (2011) the concept of anxiety is fear that is not clearly understood. Beck and Emery (2017) state that anxiety is an uncomfortable feeling that occurs in the person with the effect of fear. Butcher, Mineka, and Hooley (2013) state that anxiety is a more future-oriented concept.

Anxiety affects individuals in different ways in daily life. Spielberger and Reheiser (2009) emphasize that anxiety limits people's behaviors. According to Rector, Bourdeau, Kitchen, and Joseph-Massiah (2008), high levels of anxiety results in cognitive, physical and behavioral disorders in people. In some studies (Vitasari et al., 2010; Weda & Sakti, 2018), it was found that anxiety negatively affects academic achievement. Burkovik (2009), on the other hand, looks at the situation differently and highlights that a certain level of anxiety enables people to act more willingly in decision-making processes and to be highly motivated.

Rapee, Spence, Cobham, and Wignall (2003) state that various factors are instrumental on anxiety. According to them, these elements are age, heredity, parental attitude, number of siblings, socioeconomic characteristics, educational status of parents, gender and student success.

Speaking and writing skills are among the skills that anxiety affects in human life. In this respect, it is thought to be useful to provide information about speaking and writing anxiety in the study.

Speaking anxiety is seen in many societies around the world (Fletcher, 2017). Different factors are effective in the formation of speaking anxiety. For example, negative thinking styles may cause speaking anxiety in the individual (Linver, 1997; Condrill & Bough, 2004; Stuart, 2005; Esposito, 2010). Speaking defects and listener-based factors result in speaking anxiety in the individual (Bippus & Daly, 1999). Environmental or environment-based factors also increase speaking anxiety. Speaking in front of a large number of people is an example of this (King, 1998). In studies on speaking skills, it has been shown that students have a high level of speaking anxiety among the reasons for their failure. It is expected that the individual avoids speaking activities as the anxiety level rises, and the individual will be more motivated towards the act of speaking, take a more active role in the activities, and accordingly be more successful in performances based on speaking skills as the level of anxiety decreases (Young, 1991).

Reducing speaking anxiety is as important as its causes and consequences. Tekşan, Mutlu, and Çinpolat (2019: 1407) suggests the followings for reducing high-level speaking anxiety: the student should be with a positive attitude towards his/her speaking skills; fun, attractive, up-to-date and simple speaking activities that will enable students to develop positive attitudes towards speaking should be included; speaking activities should be carried out using different techniques such as micro-education, and environments should be created where students can express their feelings and thoughts comfortably.

Writing anxiety is defined as “the situation in which an individual avoids writing with the thought that what he has written will be evaluated” (Daly and Wilson, 1983: 327). Cheng, Horwitz, and Schallert (1999) state that individuals who want to communicate by writing may feel writing anxiety.

Many factors are effective in the occurrence of writing anxiety. As a matter of fact, Maden (2021), in his study in which he examined the literature in detail, states that many factors play a role in the formation of writing anxiety and these factors are feeling weak and inadequate in writing, lack of self-confidence, low self-efficacy in writing, negative experiences (feedbacks, experiences), lack of reading habit, slow writing.

Minimizing this anxiety is as important as the causes of writing anxiety. The following suggestions have been made to reduce writing anxiety (from Tighe, 1987 as cited in Katrancı & Temel, 2018; Şakiroğlu & Kılıç, 2019). First of all, students should understand the evaluation process by examining sample manuscripts and discussing them according to appropriate criteria. By dividing the writing process into appropriate stages in a planned manner, activities should be prepared for each level, and students should be able to master the evaluation criteria before taking each step to the next stage. Students should be made to feel ready to write. Thus, it can contribute to the students' less anxiety. It would be beneficial for peers to be included in the evaluation at the stage of reviewing written products.

1.1. The Importance and Aim of the Study

Anxiety is a concept that is effective not only in education but also in all areas of life. For example, an individual working in industry may be worried about his job, while this is also true for a doctor working in a hospital. The student studying at the school, the family and teachers of this student may also have various anxieties. While normal students may be anxious in their education life, gifted students may also have various anxieties. Therefore, the concept of anxiety is valid for everyone, regardless of the occupational group, and efforts should be made to minimize this concept.

It is seen that various studies have been conducted on gifted students, when the literature is examined. There are studies on the creativity and creative thinking skills of gifted students (Akkan, 2010; Bapoğlu, 2010; Chien & Hui,

2010; Koçak & İçmenoğlu, 2012; Kanlı, 2017; Hacıoğlu & Türk, 2018). In Turkey, there have been studies examining writing skills (Yaylacık, 2014; Yavuz, 2020), and creative writing skills (Özdemir, 2010; Akça, 2017; Saluk & Pilav, 2018; Özcan, Konaş & Polat, 2020). In addition, there is a study (Okur & Özsoy, 2015) that determines the attitudes of gifted students towards the Turkish lesson. While very few studies (Özsoy, 2015; Sevim, Karabulut, & Elkatmış, 2021) have been conducted on the writing anxiety of these students in Turkey, which also concerns our study, there is no study that addresses speaking anxiety. In this respect, it is thought that the research is original and contributes to the field. In this context, the main problem of the study is to determine the speaking and writing anxiety levels of gifted students studying at the Science and Art Center (BİLSEM) in Turkey. In the context of this basic problem, answers to the following sub-problems were sought:

1. What is the level of speaking and writing anxiety of gifted students?
2. Does the speaking and writing anxiety of gifted students differ according to gender, type of school, BİLSEM program they study and grade level variables?

2. Method

2.1. The Model of the Research

This study was designed in the survey model and conducted according to the quantitative research method. In survey studies, "the event, individual or object that is the subject of the research is tried to be defined in its own conditions and as it is. No attempt is made to change or influence them in any way. What is wanted to be known exists and it is there. The important thing is to 'observe' it appropriately" (Karasar, 2007: 77).

2.2. Working Group

The study group of this research, which aims to examine the speaking and writing anxiety levels of gifted students according to some variables, consists of 5th, 6th, 7th and 8th grade students who continue their education at the Science and Art Center in a city center in Turkey. The study was carried out with 50 volunteer students who were studying in four secondary school classes in BİLSEM and who came to the school on the days of the study.

2.3. Data Collection and Assessment Tools

In this study, the "*Speaking Anxiety Scale*" developed by Gündüz and Demir (2020) for secondary school students and the "*Writing Anxiety Scale for Secondary School Students*" developed by Karakuş Tayşi and Taşkın (2018) were used.

"*The Speaking Anxiety Scale*" was developed in a study conducted with 1214 students aged 9-14 and attending the 5th, 6th, 7th and 8th grades. The scale, which has three factors and consists of 21 items, is a Likert type measurement tool. The Cronbach's alpha value of the scale was found to be .86.

"*The Writing Anxiety Scale for Secondary School Students*" was developed as a result of a study conducted with 500 students (5, 6, 7 and 8) continuing their education in secondary schools. The said measurement tool is a three-factor, Likert-type measurement tool consisting of 16 items. The Cronbach's Alpha reliability coefficient used to calculate the internal consistency of the scale was found to be .79. A high total score from the scale will indicate a high level of writing anxiety, and a low one will indicate a low level of writing anxiety.

2.4. Data Collection and Analysis

In this study, in which the speaking and writing anxiety levels of gifted students were examined according to some variables, the data were collected by the students' own course teachers in two separate sessions. Students filled out the data collection tools on different days. Before the data were collected, the students were asked to fill in the information about *gender*, *school type*, *BİLSEM program they studied* and *grade level* within the scope of the purpose of the study. The data obtained from two separate measurement tools were analyzed using the SPSS 26 package program. Before the analysis, the reliability of the data was checked through the Cronbach's Alpha coefficient and it was understood that the reliability was high. In addition, normality test was performed, it was

seen that the data were normally distributed, so t-Test and One Way Anova Test, which is one-way analysis of variance, were used for analysis.

The findings obtained after the analysis of the data are presented in tables and by making various comparisons in accordance with the purpose of the study.

3. Findings

Findings Regarding the First Sub-Problem

The first sub-problem of the study is about *the level of speaking and writing anxiety of gifted students*. Findings related to this are given in Table 1.

Table 1: T-test Determining the Difference Between Gifted Students' Speaking and Writing Anxiety

Groups	N	\bar{X}	S	sd	t	p
Speech anxiety	50	50,18	17,94	98	4,343	,000
Writing anxiety	50	36,16	14,10			

Table 1 shows the level of speaking and writing anxiety of gifted students and whether there is a significant difference between them [$t_{(98)} = 4.343$ $p < .05$ ($p = .000$)]. While the students' speaking anxiety level is 50.18, their writing anxiety level is 36.16. It is understood from this that *the speaking anxiety of gifted students is higher than their writing anxiety* and there is a significant difference.

Findings Regarding the Second Sub-Problem

The second sub-problem of the study is *whether the speaking and writing anxiety of gifted students differ according to the variables of gender, type of school, BİLSEM program they study and grade level*. Findings for this are given in Tables 2, 3, 4 and 5.

Table 2: T-test Determining the Differences in Speaking and Writing Anxiety of Gifted Students by Gender

Groups	N		\bar{X}		S		sd	t	p
	W	M	W	M	W	M			
Speech anxiety	22	28	54,00	47,17	18,90	16,88	48	1,345	,185
Writing anxiety	25	25	36,80	35,20	13,82	14,64	48	,318	,752

In the first line of Table 2, it is stated whether the speaking anxiety of gifted students differ according to gender [$t_{(48)} = 1,345$ $p > ,05$ ($p = ,185$)]. While the anxiety levels of *female* students are 54.00, the anxiety levels of *male* students are 47.17. It is seen that the *female* gifted students have higher speaking anxiety levels than the *male* ones. However, this difference is not statistically significant.

In the second row of the table, there are data about the writing anxiety of gifted students and the analysis of these data [$t_{(48)} = ,318$ $p > ,05$ ($p = ,752$)]. Accordingly, while the anxiety levels of *female* students are 36.80, the anxiety levels of *male* students are 35.20. It is understood that the writing anxiety of gifted *female* and *male* students is close to each other and does not differ according to gender.

Table 3: T-test Determining the Differences in Speaking and Writing Anxiety of Gifted Students by School Type

Groups	N		\bar{X}		S		sd	t	p
	State school	Private school	State school	Private school	State school	Private school			

Speech anxiety	29	21	50,44	49,80	17,62	18,79	48	,123	,903
Writing anxiety	28	22	37,21	34,81	15,24	12,74	48	,592	,557

In the first line of Table 3, it is stated whether the speaking anxiety of gifted students differ according to the school type [$t_{(48)} = ,123$ $p > ,05$ ($p = ,903$)]. According to this, the anxiety levels of the students studying in public schools are 50.44, while the anxiety levels of students studying in private schools are 49.80. It is understood from this that the speaking anxiety of gifted students is very close to each other and does not differ according to the type of school.

In the second line of the table, it is seen whether the writing anxiety of the gifted students differ according to the school type [$t_{(48)} = ,592$ $p > ,05$ ($p = ,557$)]. According to this, while the anxiety levels of the students studying in public schools are 37.21, the anxiety levels of students studying in private schools are 34.81. According to the anxiety level mean scores, it is seen that the writing anxiety of gifted students studying in *private school* is lower than the writing anxiety of those studying in *public school*. However, it is understood that this difference does not differ according to the type of school.

Table 4: T-test Determining the Differences between Gifted and Talented Students' Anxiety in Speaking and Writing According to the BİLSEM Program in Which They Study

Groups	N		<u>X</u>		S		sd	t	p
	Program of recognition individual talents	Program of recognition special talents	Program of recognition individual talents	Program of recognition special talents	Program of recognition individual talents	Program of recognition special talents			
Speech anxiety	29	21	48,20	52,90	20,02	14,62	48	-,912	,366
Writing anxiety	29	21	34,41	38,57	14,73	13,15	48	1,029	,309

In the first line of Table 4, it is stated whether the speaking anxiety of gifted students differ according to the BİLSEM program they are studying [$t_{(48)} = -,912$ $p > ,05$ ($p = ,366$)]. While the anxiety level of the students studying in the program of recognizing individual talents is 48.20, the anxiety level of the students studying in the program of developing special abilities is 52.90.

In the second row of the table, there are data about the writing anxiety of gifted students and the analysis of these data [$t_{(48)} = 1,029$ $p > ,05$ ($p = ,309$)]. According to this, while the anxiety levels of the students studying in the program of recognizing individual talents are 34.41, the anxiety levels of the students studying in the special talent development program are 38.57.

Considering the anxiety level score averages, it is seen that the speaking and writing anxieties of gifted students who study in *the program to recognize individual talents* are lower than those who study in *the special talent development program*. However, it is understood that this does not differ according to the BİLSEM program they study.

Table 5a: Descriptive Statistics on Speaking and Writing Anxiety Levels of Gifted Students by Grade Levels

Classes	N		<u>X</u>		S	
	Speech anxiety	Writing anxiety	Speech anxiety	Writing anxiety	Speech anxiety	Writing anxiety

5th grade	15	13	47,33	35,76	21,03	16,96
6th grade	13	14	51,46	33,00	18,81	13,37
7th grade	14	13	49,35	38,23	14,61	13,65
8th grade	8	10	54,87	38,40	17,82	12,86
Total	50	50	50,18	36,16	17,94	14,10

Table 5b: One-Factor Analysis of Variance (One-Way Anova) Test Determining the Differences between Gifted Students' Speaking and Writing Anxiety Levels by Grade Level

Source of variance	Sum of squares		sd	Mean of squares		F		p	
	Speech anxiety	Writing anxiety	Speech anxiety Writing g anxiety	Speech anxiety	Writing g anxiety	Speech anxiety y	Writing g anxiety	Speech anxiety y	Writing g anxiety
Intergroup	328,726	247,704	3	109,575	82,568				
Ingroups	15444,653	9507,015	46	335,753	206,674	,326	,400	,806	,754
Total	15773,380	9754,720	49						

In Table 5b, it is seen whether the speaking and writing anxiety levels of gifted students differ statistically according to the grade level.

According to the table, students' speaking [$F(3, 46) = ,326$ $p > .05$ ($p = ,806$)] and writing [$F(3, 46) = ,400$ $p > .05$ ($p = ,754$)] anxiety levels does not differ by grade level. In other words, it is seen that the speaking and writing anxiety levels of gifted students do not show statistical significance compared to the classes they are studying.

Considering the descriptive statistics in Table 5a, it was found that the students with the highest speaking anxiety level were 8th grade students (54,87) and the students with the lowest speaking anxiety level are the 5th grade students (47,33). According to the same table, 7th and 8th grade students had the highest writing anxiety levels (7th grade, 38,23; 8th grade, 38,40); It is seen that the students with the lowest level of writing anxiety are 6th grade students (33,00). According to the mean scores, these differences between the classes are not statistically significant.

When the findings are evaluated, it is seen that the levels of speaking and writing anxiety are lower in the *lower grades* and higher in the *upper grades*, especially in the 8th grade students.

4. Discussion

Various results were obtained in this study, which aimed to examine the speaking and writing anxiety levels of gifted students according to some variables. One of the results reached in the study is that the writing anxiety level of the students was 36.16. Considering that the lowest score that can be obtained from the scale is 16 and the highest score is 80, it can be said that the writing anxiety levels of gifted students are moderate. In the study conducted by Özsoy (2015), it was determined that the writing anxiety levels of gifted students were low. The relevant result is in parallel with the result reached in this study. In their study, Palmquist and Young (1992) determined that the writing anxiety levels of students who are described as gifted are lower than their peers. Similar results were obtained in studies investigating the writing anxiety levels of non-gifted students, and it was

determined that the writing anxiety levels of these students were moderate (Yaman, 2010; Aşlıoğlu & Özkan, 2013; Ateş & Akaydın, 2015).

In the study, the speaking anxiety levels of gifted students were 50.18. Considering that the lowest score that can be obtained from the scale is 21 and the highest score is 102, it can be said that the speaking anxiety levels of gifted students are moderate. It was concluded that gifted students' speaking anxiety levels were higher than their writing anxiety levels and showed a significant difference. Since there is no study in the literature about the speaking anxiety of gifted students, this result is discussed with the speaking anxiety levels of non-gifted students. In this context, some studies in the literature (Aksu, 2021) that determined that the speaking anxiety levels of non-gifted students were at a medium level were similar to the results of this study, while some studies determined that the speaking anxiety levels of these students were low (Keşaplı & Çifçi, 2017; Akalın & Adıgüzel, 2020; Alturan, 2021).

In the study, it was determined that the writing anxiety of gifted students did not differ according to gender. While the anxiety level of female students is 36.80, the anxiety level of male students is 35.20. It has been determined that the writing anxiety of gifted female and male students is close to each other and does not differ according to gender. Özsoy (2015) determined in his study that the writing anxiety levels of gifted students differed significantly. It can be said that the study differs in this aspect. In the related study, gifted male students have a significantly higher level of writing anxiety than gifted female students. There are studies in the literature examining the writing anxiety levels of non-gifted students. While Yaman (2010), Tiryaki (2012), İşeri and Ünal (2012) did not find a significant difference between the writing anxiety scores of female and male students, Aşlıoğlu and Özkan (2013), Uçgun (2011), Shang (2013) found that female students' writing anxiety scores were significantly lower than male students. Xu (1993), Cheng (2002), and Tekşan (2013) found in their studies that male students had significantly lower writing anxiety than female students.

In the study, it was determined that the speaking anxiety of gifted students did not differ according to gender. While the anxiety levels of female students are 54.00, the anxiety levels of male students are 47.17. It is seen that the female gifted students have higher speaking anxiety levels than the male ones. However, this difference is not statistically significant. In the study conducted by Gölpinar, Hamzadayı, and Bayat (2018), no significant difference was found when speaking anxiety was compared in terms of gender. In a study by Gaibani and Elmenfi (2014), it was determined that being a man or a woman has no effect on speaking anxiety. In some studies in the literature, in which the speaking anxiety levels of non-gifted students were discussed according to the gender variable, while the speaking anxiety scores of female students were high (Rawson, Blomer, & Kendall, 1994; Campbell & Jones, 1997; Rosenthal & Schreiner 2000; Surtees, Wainwright, Pharoah, 2002; Keşaplı and Çifçi, 2017; Akalın and Adıgüzel, 2020), whereas in some other studies, it was determined that male students' speaking anxiety scores were high (Sevim & Gedik, 2014; Katrancı & Kuşdemir, 2015).

Speaking and writing anxiety levels of gifted students do not differ according to the grade level they are studying. When the results are evaluated in this context, it can be said that the levels of speaking and writing anxiety are lower in the lower grades and higher in the upper grades, especially in the 8th grade students. According to the mean scores, these differences between the classes are not statistically significant. In the study, the students with the highest level of writing anxiety were 7th and 8th grade students (7th grade, 38.23; 8th grade, 38.40) and it was determined that the students with the lowest level of writing anxiety were 6th grade students (33.00). Özsoy (2015), in his study investigating the writing anxiety levels of gifted students, determined that the writing anxiety levels of gifted students in the 8th grade were significantly higher than the levels of other grades. In this aspect, it can be said that the study is similar to our study. There are studies in the literature examining the writing anxiety levels of non-gifted students according to the grade level variable. In these studies, students' writing anxiety levels differ according to the class variable. In the studies conducted by Zorbaz (2010), Aşlıoğlu and Özkan (2013), it was determined that the writing anxiety of the students increased as the grade level increased. In the study, it was determined that the students with the highest speaking anxiety level were 8th grade students (54.87) and the students with the lowest speaking anxiety level were 5th grade students (47.33). Since there is no study that deals with the speaking anxiety of gifted students according to the class variable, this result is discussed with the speaking anxiety levels of non-gifted students. Keşaplı and Çifçi (2017) found in their study that as the grade levels of secondary school students increase, their speaking anxiety decreases. In the study conducted by Gedik

(2015), it was determined that there was no significant difference between the speaking anxiety mean scores of the students according to the grade level. Many studies have shown that speaking anxiety levels do not differ significantly between grade levels. When the studies in the literature are examined, it is concluded that the relationship between the grade level and the level of speaking anxiety does not differ significantly (Sevim & Gedik, 2014; Yıldırım, 2015; Kavruk & Deniz, 2015; Durmuş & Baş, 2016; Baki & Kahveci, 2017). On the other hand, in the study conducted by Gündüz (2020), a significant difference was found between the speaking anxiety of non-gifted secondary school students and their grade level.

In the study, speaking anxiety of gifted students was examined according to the type of school they studied. According to this, while the speaking anxiety level of the students studying in the public school is 50.44, the anxiety level of the students studying in the private school is 49.80. It has been determined that gifted students' speaking anxiety is very close to each other and does not differ according to school type. In a study examining the speaking anxiety of non-gifted students according to the type of school they attend (Sevim & Gedik, 2014), it was determined that students' speaking anxiety did not differ in this context. The writing anxiety of gifted students was analyzed according to the type of school they attended. While the writing anxiety level of the students studying in the public school is 37.21, the writing anxiety level of the students studying in the private school is 34.81. According to the anxiety level mean scores, it was determined that the writing anxiety of gifted students studying in private school was lower than the writing anxiety of those studying in public school. However, it was determined that this result did not differ according to the type of school. These findings show that the type of school attended is not effective on the writing and speaking anxiety levels of gifted students.

It was investigated whether the speaking and writing anxiety of gifted students differed according to the BİLSEM program they studied. While the speaking anxiety level of the students studying in the program of recognizing individual talents is 48.20, the speaking anxiety level of the students studying in the special talent development program is 52.90. While the writing anxiety level of the students studying in the program of awareness of individual abilities is 34.41, the level of writing anxiety of the students studying in the program of developing special abilities is 38.57. These results show that the writing and speaking anxiety levels of gifted students do not differ according to the BİLSEM program they are studying. In Özsoy's (2015) study, it was determined that there was no statistically significant difference between the writing anxiety mean scores of gifted students according to the BİLSEM program they attend.

When the studies in the literature are examined, it has been determined that there are very few studies on the writing and speaking anxiety of gifted students. In this context, a healthy discussion could not be made. More studies should be conducted to investigate the writing and speaking anxiety of gifted students, especially in Turkey. It is recommended to determine the general anxiety states of gifted students and the factors that affect their writing and speaking anxieties in a practical way.

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Multimodal Differentiation for Allophone Pupils in First Language French Classroom

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Abstract

Language classroom interactions can be characterized as multimodal, since teachers may resort to a variety of resources provided by their body or by their immediate space in order to convey meaning, manage activities and assess pupils' performances. Furthermore, teachers' multimodal practices constitute an essential component for the differentiating process aiming to resolve especially linguistic problems some pupils may face. In this perspective, this study examines the implementation of multimodal differentiation by the same teacher in the case of allophone pupils following first language French courses alongside with native pupils of 3rd grade within the context of inclusion classroom in a middle school in France. More specifically, it was aimed to analyze a teacher's adaptation of kinesic and proxemic behaviors within the differentiation process, such as the use of hand gestures, gaze and facial expressions as bodily resources but also the control of interpersonal distance with respect to allophone pupils. For this purpose, a micro-ethnographic research strategy was applied, and data was collected through video-recorded sessions of the teacher in inclusion classroom. Our qualitative analysis of the data revealed a differentiated use of prosodic, kinesic and proxemic elements by the teacher, such as the reduction of speech rate, the accentuation of words, the production of deictic and iconic hand gestures as well as facial expressions, the orientation of gaze, the forward leaning posture, the isolated seating arrangement, and the reduction of interpersonal distance. All these elements either follow or overlap each other, especially within the framework of teacher instructions during classroom activities.

Keywords: Multimodality, Differentiation, Teaching of French, Allophone Pupils, Gesture, Proxemics

1. Introduction

1.1 Problematic of the Study

This study deals with the multimodal treatment of linguistic gaps occurring in the case of allophone pupils within the pedagogical differentiation put forward by the same teacher. In order to delve into this problematic, the data based on the natural video-recorded courses of the same teacher was collected in a middle school in France (i.e. a category of school also called "college", which provides the first cycle of the secondary education in the country), where allophone pupils (i.e. migrant teenagers who had newly arrived in France and whose mother tongues were not French) were following first language French (FLF) courses within the inclusion classroom alongside with native French pupils of 3rd grade.

The importance of the topic in question emerges from our informal observation about a similar linguistic proficiency gap encountered with pupils learning French as a foreign language (FFL) in Turkey. For the purpose of remedying the linguistic ability differences showing up among FFL pupils in Turkey, teacher practices and/or actions involving multimodal differentiation (i.e. the adaptation of teacher actions such as hand gestures, facial expressions, gaze, posture, use of personal distance, etc. in favor of allophone pupils) are brought into consideration in this paper.

When taking into account the role of kinesics (use of body language co-occurring with speech) and/or proxemics (use of space and interpersonal distance) in FFL/FLF teaching (also in Second Language French settings), there are few experimental and empirical studies handling the issue of multimodal teacher practices about how language teachers adapt their body movements and/or distancing to enhance the transmission of meaning to non-native speakers (Tellier, 2016; Azaoui, 2017a, 2017b, 2019a; Walper, 2019; Stam & Tellier, 2021; Castany-Owhadi & Azaoui, 2022 among others). As far as the multimodality in differentiated teacher practices is concerned, Benzakki and Mendonça Dias (2022) mention for instance the use of kinesics as a pedagogical aid among language teachers communicating with allophone pupils in France, Luxembourg and Quebec; however, the authors deriving their data from a survey do not give details about the way teachers make use of kinesics. In another study establishing links between multimodality and differentiation, Azaoui and Denizci (2022) empirically observe in a French middle school a teacher communicating with allophone students during inclusion courses (FLF setting) as well as those confined solely to the same allophone students (FSL setting); the authors highlight the teacher's abundant and conscious resort to multimodal differentiation.

The objective of the present study consists in analyzing the multimodal differentiation for allophone students in FLF context and drawing from there pedagogical implications for the teaching of French as a foreign language in Turkey. We contend that the FLF classroom with allophones lays a suitable ground for studying multimodal differentiation. In this perspective, our research question is as follows: How a language teacher adapts her/his kinesic and proxemic behaviors (also the prosodic ones when relevant) in order to overcome linguistic problems occurring among allophone pupils? To find answers to this question, an 80-minute video-recorded data obtained from a teacher providing FLF courses to both native and allophone pupils attending an inclusion classroom within a middle school in France (therefore, in a natural instructional setting) was analyzed as a case study.

1.2 Relevance of the Study

As previously mentioned in the subsection 1.1, the relevance of the present study arises from its possible implications to draw for FFL settings in Turkey. More specifically, as there are linguistic level discrepancies in most cases between pupils of the same classroom, foreign language teachers should endeavor to make their linguistically weaker pupils attain course objectives within the group. Hence, the multimodal differentiation in teacher practices should be taken into account.

To our point of view, the present study can be described as relevant, for it intends to contribute to the understanding of multimodal differentiation in terms of language teachers' kinesic and proxemic behaviors for the FLF setting. It partly aims to draw conclusions for the FFL setting from the analysis.

1.3 Theoretical Framework

Human interactions are considered as inherently multimodal (Goffman, 1956), i.e. various kinesic (such as hand gesture primarily but also facial expression, gaze, posture, etc.) and proxemic actions (Hall, 1971) performed by a speaker co-occur with speech, cognitively relate to it, bear similar or complementary communicative functions with respect to her/his utterances, and especially give visual clues to the addressee for communicative purposes (Cosnier, 1982; Kendon, 2004; McNeill, 1992, 2005).

Similarly, this also applies to language classroom interactions which may be characterized as multimodal and multichannelled due to their socially/pedagogically organized settings (Colletta, 2000; Coquet, 2012; Tabensky, 2014). In other words, teachers (but also pupils) have recourse to a multiplicity of resources provided either by the pedagogical material (such as interactive whiteboard, video projector, chart, poster, computer, Internet,

course book or any object teachers are able to manipulate for pedagogical reasons) surrounding them or by their own body (i.e. kinesic and proxemic actions together with speech) while communicating with pupils. For this study, we are rather interested in kinesic and proxemic behaviors in conjunction with speech, thus making part of multimodality.

Moreover, teachers' verbal and non-verbal actions/practices (Cicurel, 2011) make an integral part of multimodality, so that they basically undertake three pedagogical functions: transmission of information (on morphosyntactic, semantic/lexical, phonetic levels), activity/interaction management and performance assessment/correction (Tellier, 2008).

The heterogeneity of language levels is prone to impede not only teaching practices but especially pupils' school success in general. In fact, it may lead to discouragement and even to school drop-out for pupils; therefore, pedagogical differentiation plays a crucial role in compensating for possible language level disparities among pupils; this being said, the main aim of pedagogical differentiation, inspired by the individualized educational models of 1960s in USA, consists in bringing all pupils (having different linguistic abilities and needs) to school success by accompanying each individual within the collectivity toward the same pedagogical goal (Perrenoud, 1992; Tomlinson, 2001; Tomlinson & McTighe, 2006; Jobin & Gauthier, 2008; Feyfant, 2016; Forget, 2017; David & Abry, 2018).

In the light of the above-mentioned, differentiation is defined as the implementation of a set of diverse pedagogical practices and procedures for the purpose of reaching a common goal within pupils whose linguistic levels may vary, and it comprises four essential components (Tomlinson, 1999; Tomlinson & Jarvis, 2009):

- content which refers to the conception of curriculum and, to a lesser extent, to the didactic material presented during a course to convey information (such as worksheets, course books, etc.);
- process including the planning of a course but also the verbal and non-verbal strategies utilized by the teacher in order to convey information, manage activities/interactions and assess student performances;
- production (or rather product) meaning the diverse outputs obtained from pupils (generally in the form of speaking, writing, tasks combining various linguistic skills, etc.) at the end of the differentiation process;
- and working environment regarding for example the placement of pupil desks or other pedagogical materials.

It needs to be pointed out that teachers may differentiate through one or more of these components to facilitate learning for pupils in difficulty.

1.4 Correspondence of Problematic to Research Design

The question of how a teacher adapts her/his kinesic and proxemic behaviors in a multimodal fashion when she/he interacts with pupils in linguistic difficulties stems from our problematic. To better answer the research question, the coordination of a French teacher's kinesic/proxemic practices with speech and prosody will be examined especially in terms of process as a differentiation component. More specifically, we are interested in how speech, gesture, facial expression, gaze, posture and interpersonal distance (but also prosody) are brought into play as a differentiation process by the teacher while conveying information by the intermediary of a didactic content in order to foster learning for allophone pupils facing a linguistic difficulty.

In the above-mentioned perspective, the teacher's verbal discourse was analyzed together with the corresponding non-verbal behaviors for the differentiated sequences. In brief, 80-minute video-recorded inclusion classroom (consisting of 2 sessions/courses) of the same French teacher, where allophone pupils follow FLF courses alongside with native ones, was observed from an ethnographic point of view as a case study. Yet, more details about the selected research design and the method of analysis will be given in the Method section.

2. Method

2.1 Participant

This research was supported in 2018 by the French Embassy in Turkey, which granted us a scholarship for post-doctoral studies. In the scope of the scholarship, we carried out our post-doctoral studies in the University of Montpellier during October-November 2018. For the purpose of working on multimodal differentiation, a middle school (or college) was chosen in the city of Sète, since the school was admitting allophone students within the inclusion classes (together with the native pupils of 3rd grade in the context of FLF) as well as the classes devoted only to allophones for FSL teaching. The invitation from the University of Montpellier and the consent forms signed by the video-recorded teacher and pupils were obtained.

The participant of this study consists in a French middle school teacher taking in charge simultaneously, within two instructional settings, the FLF and the FSL courses for allophone pupils. As far as the allophone pupils (around age 14-15) attending the inclusion courses are concerned, their linguistic proficiency was between A1-A2, as described in the Common European Framework of Reference for Languages (Council of Europe, 2020).

The selection criterion while choosing the participant was partly accessibility but primarily the participant's teaching context, i.e. she was providing French courses to both allophone and/or native pupils (respectively the Second Language French and the FLF settings). Furthermore, priority was given to the FLF classroom because we supposed that the FLF context, where allophone pupils followed courses together with native ones, was prone to multimodal differentiation more. Therefore, the participant was chosen through purposeful sampling (Merriam, 2009).

2.2 Research Design and Data Collection

On the one hand, we opted for an ethnographic research strategy (rather micro-ethnographic as our research entailed a relatively shorter period of time) to find answers to the research question, since we observed the teacher's behaviors in terms of multimodal differentiation within a group of allophone and native pupils following FLF courses in a naturalistic context; on the other hand, as we tried to effectuate an in-depth qualitative analysis of one selected teacher whose FLF classroom lent itself to a particular setting in terms of composition (i.e. allophone and native pupils) and multimodal differentiation, the present study also adheres to qualitative case study as research design (Babbie, 2010; Bryman, 2012; Paillé & Mucchielli, 2013). In consequence, the research design at issue relies on both micro-ethnography and case study.

As for the data, it was collected empirically for the same teacher through her video recordings extending to a time interval of two months; hence, an approximately 10-hour corpus was obtained, of which an 80-minute segment consisting of two FLF sessions was examined for this paper. A part of the corpus was firstly analyzed for Second Language French and FLF settings by Azaoui and Denizci (2022). In this study, it is aimed to further expand analysis by focalizing solely on the FLF setting.

2.3 Data Analysis

This study considers the notion of differentiation as multimodal. More precisely, while describing the teacher's behavioral adaptations to allophone pupils within differentiated sequences, the following parameters were taken into account: verbal discourse (its semantic content as well as its prosodic elements), hand gesture, facial expression, gaze, posture and interpersonal distance as components of multimodal differentiation process.

In this perspective, the study mainly combines discourse analysis with kinesic/proxemic analysis in the context of differentiation. Besides, the didactic content may also be differentiated, e.g. the didactic documents on which allophone pupils and native ones work may vary sometimes from one group to another. Moreover, we decided whether a sequence in the corpus was relevant or not in terms of differentiation by taking into account significant kinesic/proxemic changes observed in teaching practices in favor of the allophone pupils.

Before proceeding into the analysis of the relevant sequences of the corpus, it would be worth mentioning respectively the conventions of transcription and those concerning annotation for the teacher's utterances and kinesic/proxemic behaviors:

(a) Utterances in French are orthographically transcribed.

- (b) An utterance or a segment of utterance co-occurring with prosodic, kinesic and/or proxemic behaviors is underlined.
- (c) *<Description of prosodic, kinesic and/or proxemic behaviors>* is shown between arrowheads in italic letter.
- (d) An inaudible or irrelevant utterance is marked with three suspension points between square brackets [...].
- (e) (Figure number) is shown between parentheses.
- (f) *ENGLISH TRANSLATION OF AN UTTERANCE* is shown between asterisks in capital letters.
- (g) *dg* means deictic gesture.
- (h) *ig* means iconic gesture.
- (i) *fe* means facial expression.
- (j) *ga* means gaze.
- (k) *flp* means forward leaning posture.
- (l) *appr* means approach.
- (m) + represents the coordination of simultaneous or consecutive behaviors.
- (n) T means teacher.
- (o) AP means allophone pupil.

3. Results

3.1 General Observations

Our analyses of the two sessions in the FLF inclusion classroom reveal some general findings in a typical multimodally differentiated sequence:

- At linguistic level, the teacher simplifies as much as possible her sentences or prefers more simple words.
 - At prosodic level,
 - (a) she slows down her speech rate (or the flow of speech).
 - (b) she accentuates important words.
 - At proxemic level,
 - (a) the allophone pupils are seated together at the back of the classroom.
 - (b) the teacher approaches allophone pupil(s) closely.
 - At kinesic level,
 - (a) she directs her gaze to the allophone pupil(s) concerned.
 - (b) she produces a deictic hand gesture (i.e. pointing gesture performed in general by an extended forefinger with other fingers curled in the closed palm) toward a pedagogical material such as the pedagogical document, the course book, the whiteboard, etc. In some circumstances, she performs an iconic hand gesture (McNeill, 1992) or a facial expression to visually illustrate a verbal referent.
 - (c) she leans toward allophone pupil(s) (sometimes in addition to a crouch position).
- Figure 1 exemplifies below our general observation about multimodal differentiation.



Figure 1: General Characteristics of Multimodal Differentiation in Inclusion Classroom

T handles a French surrealist author named Michel Leiris' (1901-1990) book entitled "L'âge d'homme" (1939) for the purpose of working on the vocabulary linked to the expression of emotions as didactic content. She writes some keywords to the whiteboard and asks all pupils to make a summary of the author's feelings by using the written words. Before the differentiated sequence, T either remains standing in a stationary position in front of the whiteboard or sits on her desk (Figure 1a).

However, once she gives the instruction about the activity, the multimodal differentiation sequence starts. In an attempt to learn if her instruction is well understood and to clarify it if necessary, she quickly moves toward APs sitting at the back of the classroom. Hence, she brings into play a set of behaviors tied to multimodal differentiation process: First of all, she approaches APs, leans toward them and addresses them in a very low voice. That is why some sequences are nearly inaudible in addition to speech overlaps and background noise coming from other pupils (Figure 1b). We conclude that the multimodal differentiation takes place primarily during activity management in classroom within teacher functions, either for reminding APs of the instruction or for clarifying it. In other words, when T conveys information to all pupils (i.e. when she explains something about the didactic content), differentiation becomes almost impossible for the simple reason that she mainly addresses them as a collective body (that she prioritizes) and not as individuals. We also contend that even if she tried to resort to differentiation for a few times in favor of the APs during the general information process (on grammar, vocabulary or another linguistic point), this would probably bear the potential risk of hindering the progression of the course. In brief, we infer that T needs a kind of break between the information transmitting sequences in order to be convenient for differentiation.

Secondly, realizing that APs do not understand her instruction properly, T performs a series of kinesics to clarify it: She crouches down next to the right-hand side AP and points her index finger toward the words in the AP's notebook for meaning that the AP should consider the words written in it to complete the given task (Figure 1c). Thereafter, T brings her right hand to her mouth with a quick flick of the wrist to disambiguate the word "parler" (speak), as the task requires a summary of the author's emotions: The tips of all five fingers are gathered and curled in the palm before rubbing each other close to lips (in the form of an imaginary purse); the gesture in question is an iconic one, and it serves to illustrate the meaning of the word "speak" (Figure 1d).

3.2 Role of Proxemics in Differentiation

Concerning the use of space, the APs generally sit at the back of the classroom, which forces T to repetitive displacements between native pupils and APs when differentiation becomes necessary. In fact, the observed sequences in the corpus show the influence of spatial organization on the treatment of APs according to their position in the classroom (Azaoui & Denizci, 2022).

As it turns out, any pupil is free to choose where to sit. Nevertheless, APs may have a tendency to sit in the back rows because of shyness, probably due to their linguistic inadequacy and lack of familiarity with the culture, so that APS may be reluctant to actively participate to classroom interactions. We find this type of compartmentalized seating arrangement regarding APs ineffective and aver that it may lead to a kind of differentiator pedagogy rather than a differentiated one (Kahn, 2010). In that perspective, we may ask if it would be more efficient to advise APs to sit next to a linguistically more proficient native peer in order to enhance especially their linguistic progression (in a Vygotskian perspective) and their cultural familiarity. This way, it would be possible to not contradict the essence of differentiation, i.e. the process of accompanying the individual toward a pedagogical goal within the collectivity.

Although some of the T's kinesic behaviors stay out of camera reach because of its position, the example below illustrates this kind of isolation for an AP. T approaches him to elucidate the instruction about the activity. Interpersonal distance, gaze direction, posture, hand gestures as well as lower speech rate are all brought into play (Figure 2).



T: Michel Leiris, comment il fait pour parler *MICHEL LEIRIS, WHAT DOES HE DO TO SPEAK* <ig> (Figure 2a) de ses émotions ? *OF HIS EMOTIONS ?* <ga> (Figure 2b) Tu parles de ses émotions donc tu

YOU ARE GONNA TALK ABOUT HIS EMOTIONS SO YOU <dg> (Figure 2c) [...] le vocabulaire *THE VOCABULARY* <ga> (Figure 2d) de la trahison, de la médecine *OF BETRAYAL, OF MEDECINE* <dg> (Figure 2e). [...] Vous avez souligné *YOU HAVE UNDERLINED* <dg + ig> (Figure 2f) le vocabulaire de la trahison *THE VOCABULARY OF BETRAYAL*.

Figure 2: Multimodal Differentiation in a Fixed Proxemic Setting

While clarifying the instruction for the AP concerned, T illustrates the word “speech” with the same iconic gesture as in the previous example (Figure 2a), and she directs her gaze to AP to see his reaction (Figure 2b). Then, she points her index finger of the right hand to the words written on the whiteboard (Figure 2c) and redirects her gaze toward AP to understand once more his reaction (Figure 2d). When she says “(the vocabulary) of betrayal, of medicine”, she points her hand (deictic gesture with extended fingers and palm facing upwards) to AP, meaning that T expects an answer from AP for this activity (Figure 2e). Lastly, when she utters the word “underlined”, she performs simultaneously a deictic gesture showing the words in AP’s notebook but then, the right hand index finger sweeps the words in the notebook to illustrate the word “underlined” (Figure 2f). As far as the gestural morphology is concerned, it is an iconic gesture overlapping more or less with a deictic one.

3.3 Deictic Gestures as Practical Tools

Deictic hand gestures prove to be very practical and effective within multimodal differentiation which becomes even more evident when didactic content takes also its place in addition to process in terms of differentiation components. For example, during a collective rewriting activity concerning the modification of a text’s tense and pronouns, T provides APs with an auxiliary document in which words regarding emotions are associated to images. This auxiliary document aims to improve the writing skill of APs in relation to the collective activity. At the beginning of this sequence, T stands in front of the whiteboard. After splitting pupils into two groups (consisting of 3-4 persons for the native ones and of 2 persons for the APs), she points her index finger at APs:

T: Je vais vous donner quelque chose *I WILL GIVE YOU SOMETHING* <dg toward APs + ga>; j’arrive, une seconde *I AM COMING, JUST A SECOND*.

So, while native pupils deal with the main activity, APs start working on the auxiliary document. Next, T comes near APs and asks them:

T: Ça a été fini ? *IS THAT FINISHED?* <appr + flp> Tu as trouvé tous les mots ? *HAVE YOU MATCHED ALL WORDS?* <flp + dg toward words in the document>. As it has already been pointed out, the compartmentalized seating arrangement leads to T’s repetitive back and forth movements between APs and native pupils. Hence, after T moves away from APs to check native pupils, she comes back toward APs:

T: Vous allez faire les sentiments. D’accord ? *YOU WILL WORK ON EMOTIONS. ALL RIGHT?* <flp in front of APs>. La tristesse, la joie, la peur, la surprise, hein ? *SADNESS, JOY, FEAR, SURPRISE, OK?* <dg toward document + ga toward APs> Donc, vous regardez ça *SO, YOU LOOK AT THIS* <dg toward document>.

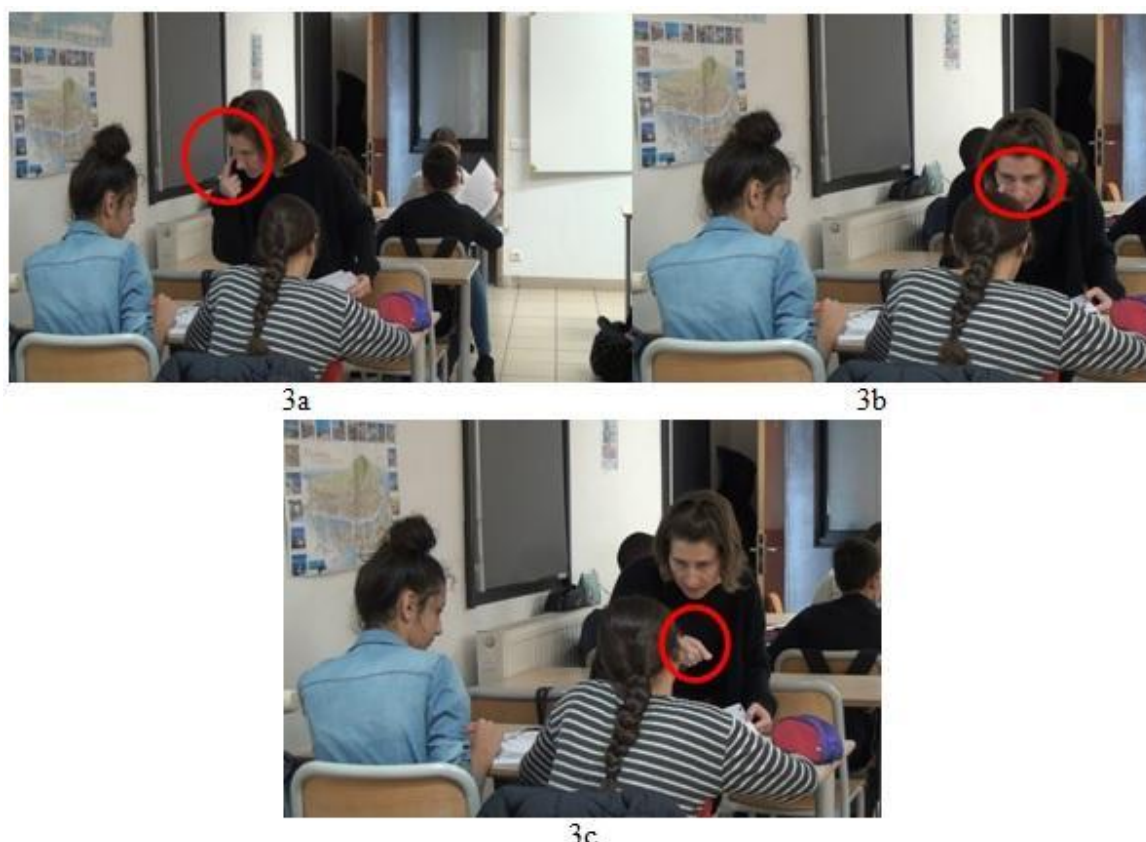
These sequences (like many others in the corpus) show indeed the frequent use of deictic hand gestures as practical tools. In fact, they are sometimes used to such a point that they may be qualified as monotonous. Yet, since deictic hand gestures may relate to any verbal referent according to the immediate communicative context (similarly to deictic adjectives and pronouns in verbal language such as “this”, “that”, etc.), they constitute one of the most frequent kinesic tools teachers resort to for the purpose of clarifying an explanation or conveying information.

3.4 Multimodal Coordination within Differentiation

Kinesic and proxemic behaviors of T may coordinate harmoniously. In other words, the verbal, prosodic and non-verbal strategies deployed by T prove to be conscious and fluent while passing from one modality to another. In that perspective, Azaoui (2019b) even speaks of the notion of transmodality rather than multimodality for referring to this kind of coordination witnessed in teachers’ behaviors.

Still within the framework of the example given in the previous subsection 3.3, T reinforces differentiation for the sake of clarity in terms of giving instructions to APs (Figure 3): First of all, considering the proxemics, T

moves toward APs and stands close to them with a forward leaning posture. Secondly, she depicts the word “lisez” (read) by bringing the right forefinger to her eyes and staring directly at the left-hand side AP (Figure 3a). T performs the same gesture in the same way for the right-hand side AP as well, but by leaning toward her more (Figure 3b). Meanwhile, T directs sometimes her deictic gesture to the auxiliary documents while pronouncing “read”; this way, the gesture refers to two different but related semantic contents: the act of reading and the documents on which this act will be accomplished. Lastly, T imitates in the air the act of writing with the intermediary of an iconic gesture (Figure 3c). For this whole sequence, T keeps her speech rate down, articulates her utterances clearly and accentuates words when necessary. In sum, she insists on the instruction: APs should read first and then write.



T <flp with a frontal position>: Vous lisez *YOU READ* <dg + ga> (Figure 3a). [...] Ça *THIS* <dg toward document + prosodic accentuation>, tu *YOU* <flp + ga + dg> (Figure 3b) lis *READ* <dg toward document + ga> et ça *AND THAT ONE* <dg toward other document>, c'est pour faire les exercices à la main *THAT IS FOR DOING THE WRITTEN WORKSHEET EXERCISES* <ga + ig> (Figure 3c).

Figure 3: Multimodally Coordinated Behaviors

To our point of view, the sequence above represents a good example for linking verbal, prosodic, kinesic and proxemic behaviors. They follow one another but gradually overlap to reinforce each other through diverse communicative channels.

3.5 Role of Facial Expression in Lexical Information

Another sequence of differentiation in relation to the same activity, where APs should associate some adjectives about personal characteristics to the corresponding images, shows that T's facial expressions also convey lexical information especially in solidarity with her self-touching hand gestures (Figure 4). That is to say, T's facial expressions overlapping with self-touching hand gestures serve to distinguish male and female adjectives, as French requires the agreement of adjectives with the corresponding nouns.

Overall, these two kinesic behaviors function in the same manner as iconic gestures, and they illustrate their semantic content, i.e. the adjectives “beau” (handsome) and “belle” (beautiful) respectively (Figure 4a, 4b).

Interestingly, T depicts a handsome man via a serious look, whereas a beautiful woman is described with a smile. This is probably due to the socially accepted norms attributed to men and women in terms of beauty, i.e. a handsome man would rather look serious, and a beautiful woman would instead smile.



T <flp in a frontal position>: Beau *HANDSOME* <ga + touching gesture to the cheek + fe> (Figure 4a).
 Belle *BEAUTIFUL* <prosodic accentuation + ga + touching gesture under the chin + fe> (Figure 4b).

Figure 4: Facial Expression Conveying Lexical Information

In consequence, facial expressions also play a role in multimodally conveying information within differentiation. Combined with self-touching gestures, they provide a visual clue to the addressee in order to deduce the semantic content of a lexical unit.

4. Conclusion and Discussion

Concerning the multimodal differentiation in the service of allophone pupils following courses together with native pupils of 3rd grade, our findings lead us to the following conclusions: First of all, in terms of prosodic elements, the teacher reduces her speech rate, articulates more her utterances and emphasizes some important words in the verbal discourse to facilitate understanding for allophone pupils. Secondly, when considering the interpersonal distances, she approaches allophone pupils generally seated at the back of the classroom (on their own choice), positions herself in front of them and adopts a forward leaning posture. Moreover, regarding the kinesic elements, she directs her gaze to allophone pupils and performs mostly deictic hand gestures to show something (e.g. a word written on the whiteboard or in the notebook, a part of her own body, an object in the classroom, etc.) but also iconic ones to illustrate a verbal referent figuring in her discourse. She sometimes resorts to facial expressions alongside with hand gestures to convey lexical information.

It should also be pointed out that the multimodal differentiation sequences mostly occur within the management of classroom activities: In such sequences, the teacher mostly focuses on allophone pupils either for clarifying her instructions or giving linguistic information in order to promote meaning within the main activity (or in the scope of an alternative activity proposed to allophone pupils for multimodally differentiating).

As it turns out, the inclusion classroom setting may present linguistic level discrepancies as well as cultural diversities. Hence, the question of how to effectively differentiate at the pedagogical level without offending allophone pupils at the cultural level arises from this setting. To our point of view, the pedagogical and cultural conclusions of multimodal differentiation may better be drawn and interpreted firstly by taking into account allophone pupils' and teachers' opinions about the matter at hand. Moreover, the efficiency of multimodal differentiation should also be assessed by considering allophone pupils' academic achievements in the long run.

At the pedagogical level, research has shown the efficiency of multimodal approaches (Azaoui, 2017b, 2019a; Castany-Owhadi & Azaoui, 2022) and the place of multimodality within differentiation (Azaoui, 2017a, 2019b; Azaoui & Denizci, 2022) in terms of teacher practices. This study also focused on multimodal differentiation rather as a process in conjunction with the above-mentioned research. Furthermore, as Benzakki and Dias Mendonça (2022) show through their survey intended for teachers (from France, Luxembourg and Québec), on

the one hand, the multimodal differentiation mostly manifests itself within teacher instructions and tasks given to pupils, and on the other hand, kinesic behaviors are cited between teacher practices contributing to differentiation. Our findings in this study are similar to theirs. Yet, the question of to what extent kinesic behaviors (and proxemic ones) serving to differentiate multimodally are conscious and systematic should be raised by further research. Irrespective of the answer, we contend that it would be opportune to integrate multimodal differentiation to the formation of pre-service and in-service teachers.

At the cultural level, it may be relevant to draw attention especially to the control of interpersonal distance by teachers and to the seating arrangement in the classroom. Our findings showed that the teacher diminished her physical distance with respect to allophone pupils in the differentiated sequences; so whether the reduced distance culturally and personally disturbs or not allophone pupils should be evidenced by further research. In addition to this, the pedagogical but mostly the psychological effects of the isolated seating arrangement (at the back of the classroom) on allophone pupils may also be investigated in future.

All in all, multimodal differentiation is very delicate in terms of delving into some pedagogical and cultural issues, as it proves to be essential for remedying pupils' problems and meeting their needs at various levels within collective pedagogical objectives. Nevertheless, its implications remain to be discovered with further research especially when considering the FFL settings in Turkey.

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Impact of Mindfulness Training on EFL Learners’ Willingness to Speak, Speaking Anxiety Levels and Mindfulness Awareness Levels

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Abstract

There has been a rise of interest in mindfulness and its effects on the educational context during the last several decades. The research study aims to investigate the effects of mindfulness training on EFL students’ level of speaking anxiety, willingness to speak in the target language, and their levels of mindfulness awareness. The perceptions of participants were also investigated in this study. In total, 41 sophomore students who were studying in the Aviation Management Department (20 in the experimental group, 21 in the control group) participated in the study. The participants were taking General English Courses for 8 hours every week in one of the state universities in the Black Sea Region, Turkey. To reduce the risk of bias, the data were gathered at different times and from multiple sources; questionnaires, and interviews. For quantitative data, the Turkish adapted versions of the Mindfulness Attention and Awareness Scale (MAAS), Foreign Language Classroom Anxiety Scale (FLCAS), and Willingness to Communicate Scale (WTC) were utilized as pre and post-tests. For qualitative data, Semi-structured Interviews were conducted. The findings of the study revealed that mindfulness had a positive effect on participants’ willingness to speak, their speaking anxiety levels, and their mindfulness-awareness levels. Qualitative data also showed that the participants got huge benefits not only in the English language learning context but also in different areas of their lives.

Keywords: Mindfulness, Speaking Anxiety, Tertiary Level EFL Learners, Willingness to Speak

1. Introduction

It is inevitable to experience language anxiety in second language learning, especially in oral communication. According to some research studies, foreign language anxiety (FLA), experiencing the emotions of worry and agitation when engaged in learning and applying a foreign language (MacIntyre & Gardner, 1994) has huge negative effects on the language learning process (Onwuegbuzie, Bailey, & Daley, 2000). Many scholars accept speaking ability as the most challenging skill causing anxiety among language learners (Cheng, Horwitz, and Schallert, 1999). Many students have difficulty expressing themselves in a foreign language at different levels due

to speaking anxiety. Even though using the foreign language orally is a requirement for students, they always complain about not being able to speak fluently as most of them are unwilling to speak even in language classes.

Many studies have tried to uncover the factors that may facilitate oral communication in a foreign language and reduce speaking anxiety (Hanafiah, et al. 2022; Sadighi & Dastpak, 2017; Chou, 2018; Pribyl, Keaten, and Sakamoto, 2001; Tsi-plakides and Keramida, 2009). This research aims at reducing speaking anxiety and encouraging willingness to communicate in ESL speaking classes with the help of mindfulness training. Mindfulness is acknowledged as a practice that influences learners' both physical and mental well-being in a good way. (Brown and Ryan, 2003). Therefore, many research studies have been carried out revealing the positive effects of mindfulness on foreign language learning. For instance, it has been suggested that mindfulness training has positively influenced the learners' performance in the language learning context (Bishop et al., 2004; Zhang et al., 2013). It has been found that mindfulness is one of the ways used to manage stress and anxiety (see Brown & Ryan, 2003). According to Langer (1990), thanks to mindful learning, students might be open-minded and creative learners and they can see the world from different perspectives. The study conducted by Roemer et al. (2009) demonstrates that the learners having a generalized anxiety disorder had less levels of mindfulness-awareness in comparison to the control group, which shows that mindfulness lessens the anxiety level of the learners. Another study conducted by Napoli, Krech, & Holley (2005) to understand the relationship between mindfulness training and students' concentration and attention levels reveals that there is a huge difference between learners trained with mindfulness exercises and other learners not involved in mindfulness training. It shows that incorporating both mindfulness training and school studies may increase students' focus and attention levels greatly.

Although it seems to be originated in Buddhism, mindfulness is commonly used in many fields, including health, psychology, communication, and education. In terms of education, it is suggested that, language learners may be involved in activities more actively, attain their attention to the meaning, increase their concentration and creativity, avoid stress, and increase their flexibility and engagement via the use of a mindfulness training. For instance, Mrazek et al. (2013) demonstrated that the students participating in mindfulness training increased their reading comprehension scores. Furthermore, Shao and Skarlicki (2009) revealed that mindfulness training positively affected the students' class performance.

However, the percentage of studies showing the relationship between mindfulness training and speaking anxiety and willingness to communicate in a foreign language is limited (Charoensukmongkol, 2019). That's why this study aims to investigate whether mindfulness training may help learners to cope with the challenge of speaking anxiety and unwillingness to communicate. It will investigate Mindfulness treatment as an education program for enhancing the attention or focus level of EFL learners, getting over learners' speaking anxiety, and fostering a willingness to communicate in a foreign language context among tertiary level EFL learners. It is clear that speaking anxiety is a big obstacle and this research study might help the field in terms of improving EFL learners' competence in speaking English efficiently.

2. Literature Review

2.1 Speaking Anxiety

McNally (1989) describes anxiety as a tendency to react frightfully to the stressors. Moreover, according to MacIntyre & Gardner, (1994, p. 284), it is "the feeling of stress and worries especially connected with foreign language learning". MacIntyre and Gardner (1994) assert that the feeling of stress and worry experienced especially in a foreign language context is not the same as the familiar feeling of anxiety and so it becomes a barrier needed to be overcome by the learners. According to Horwitz (2001), foreign language anxiety needs to be acknowledged as a necessary factor that may handicap foreign language learning. Krashen (1982) indicates that, anxiety intensifies the affective filter; as a result, language learners may not be open to language input resulting in not being able to get the messages correctly.

Some research studies have been conducted connected with speaking anxiety in EFL classrooms. Price's (1991) interview study reveals that the learners worried about making pronunciation mistakes during speaking activities

in a classroom environment feel more anxious. Moreover, oral presentation tasks create more anxiety and stress for learners. (Koch and Terrell, 1991). In their study, Koch and Terrell (1991) also show that the activities that require oral performance in the class such as presentations, group work activities, or role-playing create so much anxiety that learners have difficulties in producing statements. Huang (2004), in his study, demonstrates that university students in Taiwan suffer from a high degree of speaking anxiety in a foreign language learning environment. Liu and Jackson (2008) whose study includes 547 Chinese English learners finds that due to speaking anxiety, most students are unwilling to communicate in English classroom environments. Besides, in their qualitative study, Tsiplakides and Keramida (2009) find that because of being afraid of being humiliated by their peers, some students experience high levels of speaking anxiety.

2.2 Willingness to Communicate

It was McCroskey and his companions who first used the concept 'WTC' in first language acquisition (McCroskey, 1992; McCroskey & Richmond, 1987). Then it was mentioned again in second language acquisition (MacIntyre, Dörnyei, Clément, & Noels, 1998). MacIntyre et al. (1998) state that, the main purpose of learning a second language is to support willingness to communicate in a particular context as it is WTC which may help learners to learn the target language efficiently. When we witness WTC in a language learning environment, the possibility of practicing the target language gets higher. MacIntyre, et al. (1998) explained WTC as "being ready to take part in a conversation at a specific time with a particular person in the target language" (p.547). While explaining WTC, the researchers usually assert that WTC is more related to learners' readiness rather than the situations.

The language learners' reluctance to interact with people in a foreign language is widely encountered in language learning contexts. There have been several studies conducted to cope with the problem of unwillingness among language learners. Yu (2009) studied WTC and its relation to communication apprehension and communicative competence with 235 Chinese college language learners and found that there is an interconnection between WTC, communicative competence, and communication apprehension.

Bektaş (2005) conducted a study on 356 Turkish college students to see if they are eager to use the language orally or not in the foreign language. He concluded that learners' perception of the international community and their self-confidence are directly related to the students' WTC in the target language. Besides, he discovered that the motivation of learners and their personalities are indirectly connected with WTC. Atay and Kurt (2009) also examined the WTC with 159 students in the Turkish context. According to the findings of both qualitative and quantitative research, there is a strong connection between communication competence and WTC. Likewise, Şener (2014) studied with Turkish college students in the department of English language teaching. Both qualitative and quantitative data demonstrated that self-confidence is the most crucial factor that directly influences WTC in the second language learning process. There is a strong relationship among variables such as apprehension, motivation, students' views, characteristics, communication competence, and willingness to communicate. To conclude, a great majority of the studies on WTC indicate the importance of creating a suitable atmosphere to encourage speaking.

2.3 Mindfulness and Mindful Learning

Mindfulness is about consciousness and acceptance, and it can also be described as an ability to control, focus and redirect the attention of someone in a beneficial way (Bishop et al., 2004). Leary and Tate (2007) also described mindfulness as an awareness of the moment and asserted that it helps us in many ways; it can lessen the perception of negative future and past pessimistic thoughts, it helps us accept the present condition as it is and appreciate it without sticking to it or refusing it, it encourages positive attitudes and good feelings by improving more effective ways of communicating with other individuals, it can help you avoid the health-damaging energy.

The components of mindfulness including awareness and unconditional acceptance of present-moment experience are acknowledged as an efficient cure for distress - anxiety, panic, depression, anger, and so on (Hayes & Feldman, 2004). In spite of dating back to Buddhism and being seen as a side of spiritual tradition, the employment of mindfulness in other fields such as psychology, positive psychology, medicine, education, and communication is more of a new phenomenon (Kabat-Zinn, 1982). Thanks to this circumstance, many research studies demonstrating

the effects of mindfulness on different fields have been conducted. According to some studies in psychology, people can benefit from mindfulness in many ways. Because of mindfulness training, individuals can decrease stress (Flook, et al., 2013) decrease their overthinking habits (Ramel, et al., 2004), be autonomous individuals (Brown & Ryan, 2003), be pleased with their relationship (Carson, et al., 2004), improve their well-being (Urry et al., 2004) and develop their self-regulation (Chambers, et al. 2008).

Some research studies in medicine reveal that mindfulness and cognitive functioning are strongly related. Namely, by using mindfulness techniques, individuals can use their left brain more actively (Davidson et al., 2003) improve their memory and concentration (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013), and have more flexible cognitive skills (Moore & Malinowski, 2009). In terms of communication, mindfulness provides adaptability, flexibility, and less nervousness (Gudykunst, 2004, p. 256-263), which results in better communication skills.

Mindfulness in education called mindful learning is applied in classes to clear a busy mind and to be in the moment alertly. As a pedagogical tool, it is explained by Weare (2014) as "...learning the ability to pay attention and develop positive attitudes such as inquisitiveness, friendliness, sympathy, and non-judgmentalism..." (p. 1037). Langer (1990), who carried out a lot of studies related to mindful learning and composed plenty of theories on this subject, claims that mindful learners tend to be more creative, more sensitive to current ideas, and broaden their horizons. She explains it as "mindful learning provides opportunities to see and understand an experience in countless ways" (p.65). Further, Luberto et al. (2013) who studied with psychology students revealed that mindfulness techniques can also be effectively used to overcome frightening and tough situations. They also discovered that those who have mindfulness skills could regulate their emotions in a better way.

As reported in research, mindfulness is extensively beneficial in various fields. It is applied to boost one's attention span and foster mental clarity (Brown and Ryan 2003). It is also closely related to cognitive functions, which boost the learning process (Karelaia and Reb 2014), creative thinking skill, and decision-making skills (Capurso, et al., 2013). Actually, all the benefits are really useful for promoting speaking skills and enhancing oral presentation skills in English in many ways. First, it helps individuals focus on the topic they are studying as mindfulness encourages learners to stay on the activities moment-to-moment (Brown and Ryan 2003). Oral communication requires English learners to focus on the content fully and be attentive during the conversation. Otherwise, learners may lose their concentration and feel anxious resulting in lower performance (Mrazek et al. 2012). According to Brown and Ryan (2003), being attentive during speaking activities improves individuals' communicative competence as once learners are more engaged in activities, it becomes easier for them to reduce their anxiety and they become mindful English speakers. As a result, staying in the activities fully helps them not to be distracted by other thoughts that may hinder their performance (Mrazek et al. 2013).

Secondly, mindful learners gain the ability to have a high level of self-confidence, which prevents language anxiety (Pappamihel 2002; Pekrun 1992). Many experts agree that mindfulness can foster confidence and self-efficacy (Gärtner 2013; Glomb et al. 2011). Furthermore, one of the characteristics of mindfulness is to decrease the individuals' incessant negative thoughts causing anxiety (Gärtner 2013). Since mindful learners stay in the moment without fearing the past and worrying about the future, they avoid anxiety much easier.

Finally, mindful learners tend to be aware of the emotional stage they are living through in a speaking activity. The emotions are closely related to anxiety. As a characteristic of mindfulness, non-judgemental acceptance of negative emotions helps learners handle those negative thoughts that may hinder their ability to perform effective presentations. (Hofmann et al. 2010; Kabat-Zinn et al. 1992). Once people experience mindfulness, they realize that all the pessimistic thoughts and negative emotions could be accepted kindly and be allowed to go because they are temporary feelings that come and go (Frewen et al. 2008, 759). Therefore, the English learners who are aware of this fact may let the negative emotions go of not allowing them to handicap their presentations. Research studies have also stated that mindfulness enhances individuals' memory capacity even when they are under a lot of stress (Dane 2011; Jha et al. 2010; Zhang et al. 2013). These advantages of mindfulness, which enhance mental clarity and let pupils stay calm, can help students focus their attention on their speech and arrange its content more efficiently while speaking English (Jun et al. 2011).

Despite the numerous reports of mindfulness' good effects on human functioning, there is a significant void in mindfulness studies in the EFL environment. As a result, the current research will look at mindfulness, mindful learning, and its effects on speaking ability among university-aged EFL students. The results of a Mindfulness intervention with a group of EFL students were compared to the students of a control group who did not receive any intervention.

3. Method

A mixed-method was utilized for this research study as this methodology offers a greater range of ways to better comprehend difficult research issues in many contexts. Mixed research studies mix perspectives, enabling researchers to explore from both an inductive and deductive way, and to combine theory generation and hypothesis testing in one experiment. (Jogulu and Pansiri, 2011). An interventional quasi-experimental design was used to see the effects of the Mindfulness treatment. Besides, triangulation was utilized for this research to increase credibility and validity. The data collection tools used in this study were: questionnaires and semi-structured interviews.

3.1 Research Questions

1. Will mindfulness training make a difference for EFL students in terms of willingness to communicate?
2. Will mindfulness training make a difference for EFL students in terms of their mindfulness-awareness levels?
3. Will mindfulness training make a difference for EFL students in terms of their speaking anxiety?
4. What are the perceptions of the students participating in the mindfulness training?

3.2 Participants & Sampling

This research was conducted with the students in the Department of Aviation Management at a State University in the Black Sea Region during the second semester of the 2021 -2022 academic year. Convenience sampling was used in the research. Mackey & Gass (2012) explain this type of sampling as “members of the target population are selected only if they meet certain practical criteria, such as geographical proximity, availability at certain time, or easy accessibility” (p: 81). In total, 41 sophomore students taking General English courses for 8 hours a week took part in this study. At the beginning of the academic year, they took a placement test and as per the test findings, their level was B1 when they took part in the study. The ages of the participants varied between 20 and 23. For the goals of the study, two B1 classes were selected. The participants were divided into experimental (EG) and control groups (CG) at random. Convenience sampling was used in this study. While in the experimental group, there were 20 students, the control group consists of 21 students. At the B1 level, the students studied General English for 8 hours every week, which included integrated English skills and subskills covered within an English Coursebook. During these courses, the learners were required to do group work, pair work, or individual speaking tasks. Besides, they were also expected to perform their presentations and do a video recording and take individual speaking exams as a part of the speaking part of the schedule. The researcher was in charge of teaching main courses to these two classes during the time of the study. However, only the EG got Mindfulness training implemented by the researcher.

The researcher had previously studied and learned about implementing mindful instruction and how to conduct it from a psychology specialist through online professional mindfulness courses at a different institution. Furthermore, at the beginning of the study, the researcher consulted an academician in the field of psychology about the purposes and process of the study and got some suggestions and support from the same expert.

3.3 Instruments

3.3.1 Mindfulness Attention and Awareness Scale (MAAS)

Brown and Ryan developed the mindfulness attention and awareness scale (MAAS) to assess trait mindfulness (2003). There are 15 questions on the scale. The whole questions in the original measure were graded on a 5-point

Likert scale, with 1 being almost always and 5 being very seldom (Almost never). The 15-item instrument scale is designed to assess how attentive the participants are and how aware they are of their current everyday life involvement. The internal consistency of MAAS is .82 and $\alpha = .92$. The Turkish version of the MAAS by Özyeşil, Arslan, Kesici, and Deniz (2011) was used in the study. They found the scale's internal consistency as .80, and its reliability coefficient as .88.

3.3.2 The Foreign Language Classroom Anxiety Scale (FLCAS)

The Foreign Language Classroom Anxiety Scale (FLCAS) developed by Horwitz et al. (1986) was used to assess language anxiety. In the domain of EFL, its reliability and concurrent validity have been verified successfully (e.g. Horwitz et al., 1986; Kim, 2002). The FLCAS is a 33-item self-report that determines the amount of anxiety. It is a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree," (5). The more anxiety students experience, the higher their subscale scores are. The FLCAS is a dependable scale because Cronbach's alpha coefficient measures its internal consistency. .93, with test-retest reliability of .83 and a $p = .001$. In this study, the Turkish version of FLCAS generated by Aydın, et al. (2016) was utilized in the study. The internal consistency of the Turkish version of FLCAS was .91. the reliability is found as .88 and internal consistency is found as .80.

3.3.3 Willingness to Communicate Scale (WTC)

The original framework of the Willingness to Communicate Questionnaire was from McCroskey (1992). The WTC was created to assess whether or not you want to start or avoid interaction in a second language. The WTC consists of 12 items in which participants were asked to specify the proportion of times they would like to communicate in different types of contexts, such as a meeting or a group, and with different types of individuals, such as outsiders, acquaintances, and friends. Study participants are asked to give a percentage ranging from 0 (never) to 100 (always). The internal reliability of the total score varies from .86 to .95, with a mean estimate of .92, indicating that the WTC scale is highly dependable. Because the reliability coefficient was .88 and Cronbach's alpha was .60, the translated form of the WTC was deemed to be a trustworthy data-gathering tool. The revised version was also evaluated in a pilot study with 28 college students in Turkey.

3.3.4 Semi-structured Interviews

In addition to using scales, semi-structured interviews were also conducted to do an in-depth analysis and to understand the reasons behind the participants' responses. By conducting interviews, the researcher aimed to investigate participants' ideas, feelings, and opinions deeply. Focus group interviews were conducted with 6 students twice. A focus group is a method of gathering qualitative data. A focus group is "a collection of people who share similar qualities and meet to discuss a particular problem or an issue" (Anderson, 1990, p.241). Focus groups make it possible to acquire a lot of qualitative data in a short period. With the support of other participants, focus groups give an instant chance for evaluation or clarification on one's viewpoint. They enable researchers to analyze body language in addition to what is said. Focus groups can assist a researcher in uncovering previously undiscovered aspects of the subject of study.

To accomplish so, 6 participants were interviewed in one group session immediately following the training. Two sessions were held and in total 12 students were interviewed in two sessions. Each group interview took 15 to 20 minutes to record. Every interview was audiotaped as an audio file on a smartphone and listened to later. The audio files were transcribed and then examined in relation to their content after the interviews.

4. Data Analysis

At the very beginning of the study, the necessary permission was taken from the ethical committee of the university. The participants were randomly selected from B1 level classes as CG and EG in the Aviation Faculty. Before Mindfulness training, the whole three scales were distributed to the students in these two B1 classes (both Control Group and Experimental Group) as a pre-test. The Mindfulness Training lasted for about four weeks. Every week, the researcher and the participants in the Experimental Group met in a class on Mondays and

Thursdays and did the training. Every session took 15 minutes and every week two sessions were held. The intervention was implemented between the dates of 18.04.2022 and 19.05.2022.

The researcher met the Experimental Group prior to the start of the intervention to provide background information about mindfulness, its historical stages, the reasons for using it, mindfulness techniques, mindfulness myths, how to use mindfulness, etc in detail. The students' questions were also welcomed and answered through the warm-up session.

From April to May 2022, the Mindfulness Group got guided Mindfulness Training for four weeks. The researcher delivered the intervention twice weekly for 15 minutes on designated days. In each mindfulness session, the participants were instructed to sit comfortably to make them feel relaxed while sitting silently with closed eyes and concentrating their minds on their breathing. The researcher herself gave the instructions during those mindfulness sessions clearly in a friendly and welcoming manner. Each session was instructed according to a theme. Once the participants were through the meditation, the instruction was given according to the theme of the week. Week one consisted of Mindfulness of Breath and Everyday Mindfulness themes, Mindful Walking and Mindfulness of body were the themes of the second week. Mindfulness on Concentration and Mindfulness of Emotions were the themes of the third week. Mindfulness on Acceptance of Anxiety and Mindfulness of Safety were the themes of the fourth week. Except for these formal and informal instructions in sessions, some daily informal mindfulness activities were assigned to the participant, and two positive and negative feeling sheets were distributed to make them witness their progress and raise their awareness on this issue as the more practice they do, the more they internalize mindful learning.

5. Findings

5.1 Analysis of the Quantitative Findings

For the research, both the Control and Experimental Groups were administered the WTC, MAAS, and FLCAS scales as pre-and post-tests. The quantitative data obtained after the application of the scales were analyzed using the SPSS 26 program. Before starting the analysis, it was checked whether they fit the normal distribution to determine which type of (parametric or non-parametric) tests would be used to analyze the data. While performing this control, the Shapiro-Wilk Normality Test was used because $N_{\text{control}}=21$, $N_{\text{experiment}}=20$, and $N_{\text{intergroup}}=41$

Table 1 shows that the data fit the normality distribution.

Table 1: Normality Test

Shapiro-Wilk Normality Test							
Control Groups	Ist.	s d	p	Experimental Groups	Ist.	s d	p
WTC_PRE_CONTROL_TOTAL	0,963	21	0,587	WTC_PRE_Experimental_TOTAL	0,964	20	0,61
MAAS_PRE_CONTROL_TOTA L	0,950	21	0,348	MAAS_PRE_Experimental_TOTA L	0,985	20	0,982
FLCAS_PRE_CONTROL_TOTA L	0,975	21	0,837	FLCAS_PRE_Experimental_TOTA L	0,969	20	0,743
WTC_POST_CONTROL_TOTAL	0,962	21	0,550	WTC_POST_ Experimental_TOTAL	0,972	20	0,800
MAAS_POST_CONTROL_TOT AL	0,956	21	0,444	MAAS_POST_Experimental_TOT AL	0,926	20	0,131
FLCAS_POST_CONTROL_TOT AL	0,950	21	0,341	FCLAS_POST_Experimental_TOT AL	0,970	20	0,745

Ist: statistics, sd: degrees of freedom

When Table 1 is examined, it is seen that $p > \alpha = 0.05$ for all groups, and therefore the data fit the normality distribution. In this case, it is appropriate to use parametric tests when examining the differences between the means of the groups.

At the beginning of the analysis, it was checked whether there was a significant difference between the pre-values of the groups used in the study. With this control, it was aimed to check whether the people in both the control and experimental groups started the research process under equal conditions. Since the experimental and control groups are independent of each other, the independent samples t-test was used for analysis.

Whether there is a significant difference between the pre-test averages of the Control and Experimental groups was examined using the independent samples t-test. In addition, since the pre-test and post-test groups were dependent, the difference between the means of the groups was investigated with the paired-samples t-test.

Table 2 shows that both experimental and control groups started the research process under equal conditions.

Table 2: Independent samples t-test results of the experimental and control groups' pre-test data

Scales	Control Pre Test (Pre)			Experimental Pre-Test (Pre)			Independent Samples t-Test		
	N	Mean	SS	N	Mean	SS	t	sd	p
WTC	21	61,2857	25,61473	20	72,3000	27,43816	-1,329	39	0,191
MAAS	21	63,0476	9,74411	20	58,1500	13,43709	1,341	39	0,188
FLCAS	21	84,5238	26,82838	20	77,4000	20,01684	0,960	39	0,343

Ist: statistics, sd: degrees of freedom

When Table 2 is examined, no significant difference was found between the pre-test (pre) averages of the experimental group and pre-test (pre) averages of the control group, at the 5% significance level. In this case, it can be said that both groups were included in the research process under equal conditions.

Whether there was a significant difference between the pre-test and post-test averages of the control group was determined by using a paired-samples t-test.

As an answer to the first, second, and third research questions, whether mindfulness had an influence on students' willingness to speak, their mindfulness-awareness levels, and their speaking anxiety levels, Tables 3 , 4 ,and 5 could be examined.

Table 3: Paired samples t-test results of the control group

Scales	Control Pre Test (Pre)			Control Post Test (Post)			Paired Samples t-Test		
	N	Mean	SS	N	Mean	SS	t	sd	p
WTC	21	61,2857	25,61473	21	64,8095	29,29269	-0,949	20	0,354
MAAS	21	63,0476	9,74411	21	59,3810	9,13497	1,448	20	0,163
FLCAS	21	84,5238	26,82838	21	85,1905	27,12124	-0,180	20	0,859

SD: Standard Deviation, SD: degrees of freedom

As an answer to the first, second, and third research questions, Table 3 shows that no significant difference was found between the pre-test and post-test averages of the control group, at the 5% significance level. It can be said that the willingness to communicate in a foreign language, the level of mindfulness, and the anxiety of speaking a second language of the students who did not receive mindfulness training did not change significantly.

Whether there was a significant difference between the pre-test and post-test averages of the experimental group was determined by using a paired-samples t-test.

Table 4: Paired samples t-test results of the experimental group

Scales	Experimental Pre-Test (Pre)			Experimental Post Test (Post)			Paired Samples t-Test		
	N	Mean	SS	N	Mean	SS	t	sd	p
WTC	20	72,3000	27,43816	20	89,5000	19,64554	-3,878	19	0,001
MAAS	20	58,1500	13,43709	20	65,5000	12,80008	-3,007	19	0,007
FLCAS	20	77,4000	20,01684	20	65,4500	15,31245	3,847	19	0,001

SD: Standard Deviation, SD: degrees of freedom

As an answer to the first, second, and third research questions, Table 4 demonstrates that significant differences were identified between the pre-test and post-test averages of the experimental group, with 99% reliability. When the averages obtained from the total scores of the scales are examined, it is seen that the WTC average increased from 72.3 to 89.5, the MAAS average increased from 58.15 to 65.5, and the FLCAS average decreased from 77.4 to 65.45.

In this case, it may be said that students who got Mindfulness training had a higher willingness to communicate in a foreign language, a higher degree of mindfulness, and a lower level of second language speaking anxiety compared to their previous condition.

Whether there is a significant difference between the post-test averages of the Control and Experimental groups was examined using the independent samples t-test.

Table 5: Independent samples t-test results of experimental and control groups' post-test data

Scales	Control Post Test (Post)			Experimental Post Test (Post)			Independent Samples t-Test		
	N	Mean	SS	N	Mean	SS	t	sd	p
WTC	21	64,8095	29,29269	20	89,5000	19,64554	-3,153	39	0,003
MAAS	21	59,3810	9,13497	20	65,5000	12,80008	-1,769	39	0,085
FLCAS	21	85,1905	27,12124	20	65,4500	15,31245	2,850	39	0,007

SD: Standard Deviation, SD: degrees of freedom

As an answer to the first, second, and third research questions, Table 5 reveals that significant differences were found between the post-test (post) averages of the control and experimental groups based on the WTC and FLCAS scales, with 99% reliability, and no significant difference was found at the 5% significance level based on the MAAS scale.

When the averages obtained from the total scores of the scales are examined, it is seen that the WTC average increased from 64.8095 to 89.5 and the FLCAS average decreased from 85.1905 to 65.45. It is seen that the mean MAAS increased from 59,381 to 65.5, but this increase was not statistically significant (or significant).

5.2 Analysis of the Qualitative Findings

As an answer to the fourth research question; 'What are the perceptions of the students participating in the mindfulness training?', qualitative data was gathered via semi-structured interviews which were examined and coded to demonstrate the themes and categories. Manual coding was utilized owing to the small number of participants to gain an in-depth understanding of data. The researcher preferred inductive coding, which is a bottom-up approach. The researcher started with no codes predetermined before and developed codes in the process of analysing the dataset. Themes 1,2,3,4,5,6 and 7 are the positive sides of Table 6 and Theme 8 is about

one of the limitations of this intervention. To get reliable qualitative data, apart from the researcher, two coders who work as instructors in the same department contributed to the analysis by bringing a variety of perspectives to the data.

Table 6: Content analysis of the Semi-structured interviews

Main Themes	Categories	Codes
1. emotion regulation ability	getting rid of negative emotions	1.1 adapting to make things calmer. (S/1) 1.2 staying calm (S/1,2,7,9) 1.3 avoiding anger(S/10) 1.4 not reacting instantly (S/10,11) 1.5 relaxing more (S/5,6))
2. staying focused	being more in the moment	2.1 learning how to stay in the moment(S/2,6,11,12) 2.2 enjoying the moment (S/6) 2.3. doing things by concentrating more(S/3) 2.3 raising awareness by focusing more (S/1, 8,10) 2.4 focusing on even small things (S/5, 10,11,12)
3. not identifying yourself with your emotions	putting some distance between you and your emotions	3.1. distance with feelings (S/2,3,5,6,11) 3.2. not identifying yourself with your feelings (S/2,9,10,11)
4. lowering ESL public speaking anxiety	not being afraid of speaking	4.1. being eager to speak (S/ 2,3,7)
5. enabling more self-confidence	speaking willingly	5.1. gaining self-confidence in speaking. (S1,2,6,7,8,9,
6. reducing fear of making mistakes	not focusing on mistakes	6.1. not hesitating to talk (S/6) 6.2. speaking more (S/2) 6.3. focusing on speaking but not mistakes (S/10)
7. reductions in rumination	getting rid of obsessions	7.1. not being addicted to the past (S/ 12) 72. getting rid of worries (S/11)
8. taking time	getting used to it	8.1. not having enough time to get benefit from it in English classes (S/11,12)

5.2.1 Theme 1. Emotion regulation ability

Students stated that mindfulness helped them cope with their problems more calmly and effectively. In this respect, students 1,2,7, and 9 pointed out the benefits of mindfulness in terms of calming themselves in stressful situations.

"Mindfulness, helped us to be aware of the things that we are doing and it has helped us to do things more calmly." (S/1)

"It was better in terms of calming myself down when I experienced one extreme event in times of stress and crisis." (S/1,2,7,9)

Students 10 and 11 mentioned the differences in their reactions to events after mindfulness training.

"I was an angry person but now I don't exaggerate events." (S/10)

"For example, I used to give very sudden reactions when I got angry. Now I can stand calmly like this." (S/10,11)

"Students 5 and 6 directly stated how mindfulness helped them sleep more comfortably and have a clear and relaxing mind."

"Practicing mindfulness activities made me relax, at least it made me think more clearly" (S/5,6)

"Doing Body Scanning exercise before sleep helped me to sleep more comfortably because before mindfulness, I couldn't go to sleep easily because of many negative thoughts in my mind."(S/6)

This conclusion is also consistent with Caldwell, et al. (2010) research findings, as mindfulness integration in schools improves children's sleep quality. Implementing mindfulness in the educational context, according to Greeson, et al. (2015), enables learners to handle a stressful heavy workload and act calmly. This supports the findings of the current study in terms of assisting students in controlling their emotions and being more flexible in stressful situations. Applying mindfulness in the educational setting, according to Greeson, Toohey, and Pearce (2015), assists students in managing stressful hectic schedules and acting calmly.

5.2.2 Theme 2. Staying focused

Students 1,2,3,5,6,10 and 11 directly stated that thanks to mindfulness, students could stay focused more easily and effectively.

"By focusing on the sound, I can understand and learn the pronunciation better now." (S/1)

"I learned to stay in the moment because most of the time I had very different thoughts in my mind so I used to think of different things while doing one job." (S/2)

"Now I do the things I do with more focus and I can stay in the moment more."(S/3)

"I can understand and focus on small things right now." (S/5)

"I realized that it is more delicious to focus on what I am doing at the moment without thinking too much." (S/6)

"I enjoyed more by focusing on the moment not by thinking beyond, before or after that moment, but by staying in the moment." (S/ 6)

"Mindfulness increased my awareness of the things that I was doing more and this awareness made my works more efficient." (S/10)

"In general, I was looking out of the window in classes, but now I can focus on you better." (S/11)

It's vital to note that the purpose of mindfulness training is to let the practitioner observe the present moment for what it is. Because mindfulness methods entail maintaining focus on the present-moment reality and it also brings attention back when it starts to wander (Bishop et al., 2004). Mindfulness training has been linked to improved sustained attention in novice meditators (Chambers, et al., 2008). One study found a link between intervention-related increases in sustained attention and lower levels of depressed feelings (Chambers et al., 2008).

The majority of one's conscious life is spent in a condition in which the mind is not concentrated on a single job (Killingsworth & Gilbert, 2010). Once task-unrelated ideas impair attentional focus, mind wandering occurs.

Mind-wandering is one of the most challenging barriers for learners. In this regard, learners who are aware may be able to focus more on their academic achievement while focusing less on their faults (see Kabat-Zinn, 1990). Namely, EFL learners may effectively stay focused on activities and discard preoccupying ideas when they are firmly anchored in the present moment, therefore relaxing their tense brains.

5.2.3 Theme 3. Not identifying yourself with your emotions

Students 2,5,9,10,11 declared that they could keep their distance from their emotions.

"I tried to keep the distance with my feelings." (S/2)

"Those feelings don't belong to me, they come and go like clouds in the sky." (S/2)

"I remind myself that I don't need to be sad because it will pass anyway." (S/5)

"By constantly reminding myself that feelings come and go, I was actually able to get out of that state of internalization and adoption." (S/9)

"When we feel angry, we know that this feeling is not us. In fact, it will go away." (S/10)

"When it hurts, it hurts now but I know it will pass." (S/11)

Mindfulness training may also improve metacognitive awareness, viewing them as transient mental occurrences rather than identifying with them or believing thoughts to be true representations of reality (Segal et al., 2002; Shapiro, Carlson, Astin, & Freeman, 2006). Teasdale (1999) expected that enhanced metacognitive awareness would mean a reduction in rumination, a process of recurrent negative thinking that has been linked to a variety of psychiatric problems (Ehring & Watkins, 2008). Teasdale (1999) predicted that increased metacognitive awareness could lead to less rumination, a type of persistent negative thought connected to a range of mental illnesses (Ehring & Watkins, 2008). In this respect, when students encounter difficulties during their oral performance in an educational context, they may overcome their negative thoughts by keeping a distance from their feelings.

5.2.4 Theme 4. Lowering ESL public speaking anxiety

Students 2, 3 and 7 declared that they could overcome their speaking anxiety thanks to the mindfulness training.

"Our excitement wears off as we focus on our conversation." (S/2)

"I get excited when I try to speak in an unfamiliar environment, but it passes very quickly now" (S/3)

"If I couldn't speak fluently like that, I had a desire not to speak, and I was discouraged. It's broken now." (S/7)

In research by Arch and Craske (2006), college students rated their emotional reactions to a series of affectively valenced photos in between hearing one of 3 pairs of audio guidelines: mindful breathing, unfocused concentration, or anxiety. Those allocated to the concentrated breathing group showed consistently favorable emotional reactions, but the other two groups exhibited a reduction in positive emotional reactions to neutral slides. In their study, Campbell-Sills, Barlow, Brown, and Hofmann (2006), Patients with anxiety and depression problems were randomly allocated to accept or suppress their feelings while watching an emotionally arousing video. The two groups experienced identical degrees of subjective suffering while watching the video, but the acceptance group's heart rate was slower and they expressed less negative feelings when compared to those in the suppression condition. These results demonstrate that training in two essential aspects of mindfulness meditation (focused attention and acceptance) might lower emotional responses to unpleasant stimuli while also increasing readiness to stay in contact with them.

This discovery, in particular, is parallel with the previous studies that have shown the advantages of mindfulness in helping people function better in hard conditions (Hofmann et al. 2010). Mindfulness is linked to reduced ESL speaking anxiety. The research study also shows the effectiveness of mindfulness in assisting people in doing well in stressful settings (Hofmann et al. 2010). The fact that it mindfulness is linked to speech anxiety in L1 (Fleming, & Kocovski, 2013) indicates that mindfulness may also be implemented in L2 classes to avoid speaking anxiety.

According to Semple, Reid, and Miller (2005), adopting a 6-week trial of mindfulness helps treat kids with anxiety problems, which is consistent with the current research study.

5.2.5 Theme 5. Enabling more self-confidence

Students 1,2,5,6,7,8,9 and 10 claimed that with the help of mindfulness training, they had more self-confidence in their oral performance. They also pointed out that they were more willing to speak English in class and with their foreign friends.

"It actually made us have more Self-Confidence." (S/1)

"This activity gave me the courage that I need because, for example when I feel very excited before I start speaking, I say, if I start talking, this feeling will go away." (S/2)

"My foreign friends wanted to talk by voice instead of texting, I wasn't willing to do that before, but now I'm not that far from that." (S/5)

"I am more self-confident. I don't wonder if the thing I am saying is right or wrong. I just say it even if it's wrong. I focus on expressing myself." (S/6)

"I used to avoid attending the classes in the first year. I was very afraid to attend the classes. Even compared to previous semesters now, I do not hesitate to attend classes, on the contrary, it is not difficult for me to talk in the class." (S/7)

"I was afraid of talking when you asked my opinion. You know, I was writing a sentence to myself, for example, I was making preparations, but I was reluctant to speak in the class. Now, I have more courage to speak willingly in the class." (S/8)

"I coped with my speaking anxiety a little bit." (S/9)

"Especially when I have more self-confidence, I want to communicate with foreigners more." (S/10)

Bandura (1997) also thought that self-efficacy can help people control their emotions. Individuals' anxiety levels will grow if they believe they are not capable of achieving desired goals or are not well qualified and ready to handle stressful occurrences, according to him. Likewise, EFL learners may view things as harsher and more challenging than they are due to a lack of confidence in their own capacities to cope with hard and stressful events. They could also be more worried and sensitive about others' perceptions of them. Because of that fear, they might avoid interacting with others. Besides, they may also be anxious about their academic performance. (see Fallah, 2014). The findings are also in line with Bellinger, DeCaro, and Ralston's (2015) study, which found practicing mindfulness reduces exam anxiety and improves arithmetic ability. Likewise, because of mindfulness treatment, students may handle their speaking anxiety. That's why they can also perform well in English exams.

5.2.6 Theme 6. Reducing fear of making mistakes

Students 6, 9 and 10 reported that their fear of making mistakes reduced to a great extent.

"When I talk to foreigners, I don't hesitate because I know that when I make a mistake he/she can correct me. No problem with that." (S/6)

"Because we are not afraid of making mistakes now, we try more to speak." (S/9)

"I was focusing on making it a little more perfect. Even if it's wrong right now, I know that the other person will understand me when I speak." (S/10)

"In reading classes, while reading loudly, I used to be afraid of making mistakes. Now, I am a little more relaxed because I know that the teacher can correct me and my friends only focus on understanding the reading text." (S/10)

Mindful learners may focus more on their learning and achievement while paying less attention to their faults. (see Brannon, 2010), resulting in reduced test stress and communication anxiety. In other words, EFL learners may better concentrate on activities and discard preoccupying ideas when they are firmly anchored in the present moment, therefore relaxing their tense brains.

5.2.7 Theme 7. Reductions in rumination

Students 11 and 12 stated that they could get rid of their unpleasant, auto and negative thoughts.

"I was a person who was too attached to a past event and I couldn't leave behind it. Now, I am not addicted to such things anymore because I try to focus on the moment." (S/ 12)

"I was the person who wore things too much and worried too much. Now I could get rid of most of my worries." (S/11)

5.2.8 Theme 8. Taking time

Students 11 and 12 stated that they needed more time to apply the things they have learned in their oral production.

" Before speaking exam, I tried to calm down by doing the exercises we have learned. I could achieve some but I think we need more time to get benefit from it. (S/11)"

"I couldn't use it in my speaking classes. Actually, I am already a talkative person. In the class, I know my friends so there is no need to get excited but in time, we can get benefit from it more. (S/12)"

These results can also be interpreted in terms of the reality that mindfulness can reduce rumination (Coffey, Hartman, & Fredrickson, 2010), which is characterized by persistent, unpleasant, and auto thoughts about the future or past and is linked to anxiety and depression (Nolen-Hoeksema, 2000). Previous studies show that mindfulness training promotes metacognitive awareness (Teasdale et al., 2002) and decreases rumination (Jain et al., 2007). According to Ramel, Goldin, 2 Carmona, and McQuaid (2004), the reduction in a depression upon MM training is attributed to a reduction in ruminative thinking patterns, which include persistent, automatic negative thoughts (also known as ruminative thoughts).

6. Discussion

In response to the initial research question (whether there are any statistically significant between EFL students who received mindfulness training and those who did not in terms of willingness to communicate), significant differences were identified between the pre-test and post-test averages of the experimental group, with 99% reliability. However, in the control group, the willingness to communicate in a foreign language did not change significantly. It is possible to conclude that students who had Mindfulness training were more eager to speak in a foreign language. This study's findings are consistent with Dane's (2011) findings, which found that mindfulness has a favourable relationship with task performance and can boost students' willingness to communicate. Furthermore, the current study's findings are consistent with Yashima's (2002) willingness to communicate paradigm, which reveals that a stronger willingness to speak is linked to reduced anxiety and higher awareness of communicative competence. Qualitative data also reveal that students who got mindfulness training could cope with their anxiety of making errors while speaking both in or outside of the class, which shows that as students stated in the interviews, they got more courage and confidence while performing their presentations or in group discussions, etc. Even when they were asked to speak with foreign people, they could express themselves without fear and shyness. As McCroskey and Richmond (1987) stated in their study, shy humanbeings prefer to be mute and hesitant to speak. According to the qualitative data, students also claimed that while they focused on the fear of being laughed at by the people around them before the training, thanks to the training, they could focus on their performance and the meaning more, which might help them to handle the stressful situation. In addition to this, students added that they could learn how to regulate their emotions in stressful situations. Some of them claimed that with the help of mindfulness meditations, they could react more positively in tough conditions, The finding is parallel with Roemer et. al (2009) study showing the connection between mindfulness and emotion regulation.

As an answer to the second research question, (whether there is a difference in mindfulness levels between EFL students who received MMCI training and those who did not? Quantitative findings revealed that participants who attended mindfulness training had a great level of mindfulness. With 99 percent reliability, significant changes were found between the experimental group's pre-test and post-test averages, yet the levels of mindfulness-awareness in the control group did not change significantly. Qualitative data also support this finding in many ways. The participants stated that they used to be too busy with their past or future worries, thanks to the mindfulness training, they could raise their awareness about the importance and benefits of staying in the moment

greatly, which might influence their ability to focus on their speaking tasks but not their worries. Mindfulness has been proven in various fields to bring participants' attention to staying at the moment. (KabatZinn, 2003). Furthermore, the participants also claimed that they could stop living life on autopilot, which means that they could fulfill their tasks with great awareness. The study conducted by Campbell and Christopher. (2012) is also consistent with the findings of the study indicating that the kids participating in mindfulness training had better attention scores. The students also stated that instead of bouncing aimlessly from one job or idea to another, they could concentrate on their activities more attentively. Habitual and instinctive responses, thoughts moving from one issue to another one and absent-mindedness are all signs of mind wandering (Mrazek, Smallwood, & Schooler, 2012). On the other hand, table 5 shows that, when the post results of the experimental and control group were compared, it was found that the mean MAAS increased from 59,381 to 65,5, but this increase was not statistically significant. This finding is also parallel to some other studies which didn't generate statistically significant findings on mindful attention and awareness. (Bruette et al., 2020; Washington 2021).

In this study; however, it was found that, whereas within the experimental group, statistically significance was realized in mindfulness-awareness levels of the participants, only when the control group and experimental group's post-test results on mindful awareness were compared, the result concludes that there is an increase but not statistically significant. In fact, this finding is supported by qualitative data in many ways. Some participants asserted that they needed more time to be able to implement and digest the mindful techniques in their lives. In addition to this, an increased dose of the mindfulness treatment with a series of sessions for a long time could be preferable for some participants to make them apply the techniques they learned. While some participants could apply mindfulness to their language learning process and their own lives more easily, some others may need more time.

Regarding the third question, (whether there is a difference in L2 speaking anxiety between EFL students who received mindfulness training and those who did not), it could be stated that in terms of quantitative data, the students' FLCAS average decreased from 77.4 to 65.45 indicating that the participants had a lower level of second language speaking anxiety after the intervention. This finding was also supported by qualitative data in a variety of ways. The participants claimed that they could reduce their anxiety in their oral production both inside and outside of the classroom. Some of them also indicated that as they got more self-confidence, they became more eager to express themselves in English. Some others even claimed that they were demotivated to attend English classes, but after the treatment, they were more encouraged to attend and participate in classes. The findings of both quantitative and qualitative data are in parallel with some other studies. According to the findings of the study implemented by Charoensukmongkol, 2016, mindfulness is linked to decreased ESL speaking anxiety and, as a result, greater performance. According to Brannon (2010), mindfulness, assessment stress, and fear of interacting or talking were also inversely related among university learners. Furthermore, the findings of this study are consistent with those of KabatZinn (2008) and Siegel (2010) who found that mindfulness can reduce anxiety. Besides, the findings reveal that mindfulness is an effective tool to get rid of anxiety and stress. All these data demonstrate that speaking anxiety could be overcome greatly with the help of mindfulness treatment.

As an answer to the fourth question, qualitative data were gathered through semi-structured focus-group interviews conducted with 6 students in one session and 6 students within another session. Qualitative data indicate that nearly all students were satisfied with the intervention and they realized the benefits of mindfulness and immediately started to implement the techniques they learned in their own lives. In terms of their health issues, some of them claimed that they could overcome their sleeping problems. They could breathe with awareness, and regulate their emotions. At school, they could get rid of their fear of speaking, attend and participate in their classes more willingly, and focus on their tasks and activities. Namely, some of them stated that they were able to avoid mind-wandering enormously, which affected their grades positively. Apart from formal mindfulness meditations, applying daily mindfulness techniques raised their awareness. As they learned how to differentiate their emotions from their own identities, they could overcome their negative thoughts and become more eager to attend classes.

To conclude, all these results prove that using mindfulness treatment in a school context may reduce the students' speaking anxiety, increase their willingness to communicate, and raise their mindful awareness. Both quantitative and qualitative data supported the findings.

7. Conclusion

The present study was conducted to test if mindfulness training made a difference for EFL students in terms of increasing their willingness to communicate, raising their mindfulness-awareness, and lowering their speaking anxiety. The study was also designed to see the perceptions of students towards mindfulness treatment. The research was carried out in one of the state universities in the Black Sea Region in Turkey during the academic year of 2021-2022 in the spring term. Convenience sampling was conducted for selecting the participants for the study. The study included two groups; the experimental group consisted of 20 sophomore students (13 females & 7 males), and the control group consisted of 21 sophomore students (12 males & 9 females) studying at Aviation Management Department. They were taking 8 hours of General English courses every week at the time of the intervention. Semi-structured interviews, the Willingness to Communicate Scale (WTC), Mindfulness Attention and Awareness Scale (MAAS), and The Foreign Language Classroom Anxiety Scale (FLCAS) were utilized as data collection tools.

Both quantitative and qualitative data findings revealed that mindfulness training increased students' willingness to communicate in English, raised their mindfulness awareness, and lowered their speaking anxiety to a great level. The students also found mindfulness training useful in both their school lives and private lives for a variety of reasons such as better concentration, higher willingness to participate in discussion activities, lower stress, fear, depression, anxiety levels, better health conditions, better relationships, better emotion regulation ability, more self-confidence. The findings of the study also indicated that mindfulness became useful not only in terms of increasing their willingness to communicate or lowering their speaking anxiety but also it became beneficial in a variety of areas.

All these findings may support the idea that mindfulness might be implemented in all types of education institutions as all students might get help from mindfulness training to some extent. In fact, mindful schools have already started to spread all around the world.

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Investigating the Relationship between University Students' Cyberloafing Profiles and Life Goals according to Various Variables

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Abstract

Cyberloafing is a widely recognized concept associated with the Internet, which has a wide usage area today. Cyberloafing is extensively noticed, particularly among young people, and its association with a variety of variables is being researched. In this study, university students' life goals and cyberloafing profiles were analyzed on the basis of gender, age, class, grade point average, relationship status, faculty, foreign language knowledge, daily digital tool usage time, age of first using the internet, and digital devices used. The research's study group was comprised of university students from İzmir's public and private universities. 334 students posted data. The study excluded 31 participants who were found to have missing or incomplete data. The study group included 303 students. As data collection instruments, the cyberloafing scale, life goals scale, and personal information form were employed. According to the data, there is a positive and moderate association between students' levels of cyberloafing and their life goals. Cyberloafing varies according to criteria such as age, gender, faculty, and daily internet usage. Similarly, it was found that life goals changed depending on department, relationship status, and daily internet usage time.

Keywords: Cyberloafing, Life Goals, University Students

1. Introduction

1.1 Definition of the Problem

Internet use is becoming more and more widespread in today's world and the average duration of daily internet use has been reported to be 6 hours and 55 minutes (We are social, 2021). Calculated for the age range of 16-64, this duration amounts to nearly 25 % of a day. Thus, it is clear that internet use takes up a considerable amount of time in an individual's life and inevitably influences his/her short-term and long-term goals. The percentage of internet users in Türkiye is 92 (Turkish Statistical Institute, 2021). While internet use is generally associated with useful practices such as education, shopping and online transactions etc, it sometimes leads to certain problematic behaviors including online game addiction and cybercrimes etc. One of the problematic internet uses recently

added to the list is cyberloafing. Accessing education and teaching environments via the internet, free wi-fi services provided by all universities and proliferation of smart mobile phones among university students (Gökçeşlan et al., 2018) are some of the determining criteria for the presence of cyberloafing.

Cyberloafing is defined as students' engaging in some activities rather than those related to the lesson during a lesson such as surfing on the internet and watching videos etc. (Kalaycı, 2010; Lim & Chen, 2012). Ugrin et.al (2008) defined cyberloafing as all the activities causing individuals to spend their time inefficiently on the internet. The literature on cyberloafing introduces various classifications proposed by the researchers focusing on the issue (Blau et.al., 2006; İnce & Gül, 2011; Mahatanankoon et.al., 2004). One of the most acknowledged classifications was suggested by Blanchard and Henle (2008) under two categories. The first one called "serious cyberloafing behaviors" involve spending active time on gambling/betting websites, watching or downloading illegal online content, downloading music from illegal resources and spending time on adult websites etc. "Minor cyberloafing behaviors", on the other hand, include certain behaviors and activities such as sending and receiving personal e-mails, visiting sports or news websites, spending time visiting websites related to one's personal interests. Thus, it is clear that cyberloafing is a significant factor in one's engaging in certain activities to achieve his/her short-term and long-term goals.

Life Goals are discussed and examined under different categories within the framework of factors related to how one makes sense of life. According to Heady (2008), success involves being active in family and social life and helping others. Having life goals and regulating life accordingly are considered one of the most important sources of happiness (Lyubomirsky et.al., 2005). Kasser and Ryan (2001) discuss individuals' life goals under two dimensions: internal life and external life. Within the framework of social learning theory, Rotter highlights that life goals are one of three determining factors that affect human behaviors.

Life goals of university students were examined in relation to various variables. To illustrate, Cigerci et.al (2020) investigated the relationship between life goals and smart phone addiction in a study conducted with 677 university students who study health sciences. Similarly, some researchers explored the relationship between life goals and self-efficacy satisfaction (Aydiner, 2011), its effects on subjective well-being and psychological need satisfaction İlhan and Özbay (2010) and meaning of life (Çelik (2016). Short-term and long-term goals of university students often depend on various factors. Behaviors they display while using the internet play a determining role in achieving their future life goals since these behaviors take up an important part of their daily life.

1.2 Purpose of the Study

The study aims to examine the relationship between university students' life goals and cyberloafing profiles according to different variables. To achieve this purpose, university students' life goals and cyberloafing profiles were examined in terms of gender, age, class year, GPA (grand point average), relationship status, the faculty attended, knowledge of foreign language, duration of digital devices use a day, the age when they started to use the internet and digital devices used. The primary research question of the study is "Is there a significant relationship between university students' life goals and cyberloafing profiles?"

Secondary research questions of the study are as follows:

Do university students' cyberloafing profiles differ according to various variables (gender, age, class year, GPA, relationship status, the faculty attended, knowledge of foreign language, duration of digital devices use a day, the age when they started to use the internet and digital devices used)?

Do university students' life goals differ according to various variables (gender, age, class year, GPA, relationship status, the faculty attended, knowledge of foreign language, duration of digital devices use a day, the age when they started to use the internet and digital devices used)?

2. Method

The survey model, which is one of the quantitative research approaches, was used to conduct the study. The cross-sectional survey approach will be employed since the study data will be collected all at once.

2.1 Participants

The research's study group includes of university students from Izmir's public and private universities. A total of 334 students provided data. The study excluded 31 participants who were found to have missing or incomplete data. The study group had 303 students. Table 1 shows the demographic characteristics of the participants, such as gender, grade level, age distribution, grade distributions, relationship status, and the faculties they studied.

Table 1: Demographic characteristics of the participants

Gender	n	%
Woman	203	67.0
Man	100	33.0
Grade Level		
1 st Grade	48	15.8
2 nd Grade	65	21.5
3 rd Grade	20	6.6
4 th Grade	170	56.1
Age Distribution		
17-21	132	43.6
22-26	171	56.4
Grade Distribution		
1.00 – 1.99	14	4.6
2.00 – 2.99	94	31.0
3.00 – 4.00	90	29.7
Relationship Status		
Single	135	44.6
Married	39	12.9
Have an ongoing relationship	77	25.4
Not have an ongoing relationship	52	17.2
Faculty		
Education	106	35.0
Science – Literature	53	17.5
Economics – Business	17	5.6
Nursing	48	15.8
Engineering	4	1.3
Fine Arts	25	8.3
Architecture	1	0.3
Theology	31	10.2
Conservatory	18	5.9

The English, German and French foreign language levels of the participants were determined to be graded at beginner, intermediate and advanced levels. The characteristics of the participants' foreign language level information are given in Table 2.

Table 2: Foreign language levels of the participants

English Level	n	%
Beginner	114	37.6
Intermediate	114	37.6
Advanced	44	14.5

No Knowledge	31	10.2
German Level		
Beginner	43	14.2
Intermediate	12	4.0
Advanced	12	4.0
No Knowledge	236	77.9
French Level		
Beginner	9	3.0
Intermediate	2	0.7
Advanced	-	-
No Knowledge	292	96.4

The characteristics of the participants' daily digital tool usage time, time of starting to use the internet and the level of the most used device while connecting to the internet are given in Table 3.

Table 3: Digital technology usage status of the participants

Daily Digital Tool Usage Time	n	%
Less than 2 hours	71	23.4
More than 2 hours – less than 4 hours	134	44.2
More than 4 hours	98	32.3
Time to Start Using the Internet		
Primary school and before	75	24.8
Middle school	124	40.9
High school and after	104	34.3
Most Used Device While Connecting to the Internet		
Desktop computer	69	22.8
Notebook	167	55.1
Tablet computer	58	19.1
Smart phone	271	89.4
Smart watch	5	1.7

2.2 Data Collection Tools

In the study, Akbulut et al. (2016) “Cyber Loafing Scale” and Aydiner (2011) “Life Goals Scale” and personal information form prepared by researchers were used.

2.3 Cyberloafing Scale

The total variance of the scale was determined as 70.44%. Scale items are grouped under five factors. The factors were determined as sharing, shopping, updating in real time, accessing online content and playing games. Kaiser-Meyer Oklin (KMO) sample adequacy measurement value was calculated as 0.921. The internal consistency coefficient for the overall scale was found to be 0.942. It is a 5 likert type scale with 30 questions.

2.3.1 Life Goals Scale

The total variance of the scale was determined as 56.87%. The scale items developed in a five-point Likert type are grouped under five factors. Factors were determined as personal development, financial gain, physical appearance, social responsibility and individual awareness. Kaiser-Meyer-Oklin (KMO) sample adequacy measurement value was calculated as 0.900. It is a 5 likert type scale with 30 questions.

2.3.2 Personal Information Form

It was organized by the researchers to determine the characteristics of the participants in line with the purpose of the research.

3. Findings

The data obtained within the scope of the research were analyzed and answers were sought to the research problems. The findings obtained in this context are presented below.

3.1 Investigation of the Relationship Between University Students' Cyberloafing Levels and Life Goals

Table 4 shows that there is a positive and moderate relationship between cyberloafing levels and life goals ($r = 0.428$, $p < .001$). The relationship between cyberloafing levels and sub-dimensions of the life goals scale was also examined. According to this review, it is seen that there is a positive and moderate relationship between cyberloafing levels and physical appearance ($r = 0.497$, $p < .001$) and financial gain ($r = 0.493$, $p < .001$) sub-dimensions. Since the relationships between cyberloafing levels and the social responsibility, individual awareness and personal development sub-dimensions of the life goals scale are $p > 0.05$, the relationship between them is not significant.

Table 4: Correlation analysis of the relationship between cyberloafing levels and life goals

n = 303	Cyberloafing	Life goals
Cyberloafing	-	0.428**
Life goals	0.428**	-

** Significant at the .001 level.

3.2 Investigation of University Students' Cyberloafing Levels According to Various Variables

Cyberloafing levels of university students were investigated according to gender, age, class, grade point average, relationship status, faculty, foreign language knowledge, daily digital tool usage time, age of starting to use the internet and digital devices used. The findings are presented below.

3.2.1 Investigation of University Students' Cyberloafing Levels by Gender

In order to determine whether the cyberloafing levels of the participants changed according to gender, an independent sample t-test analysis was performed (Table 5). The results of the analysis show that cyberloafing levels make a significant difference according to gender ($t(301) = -3.701$, $p < .001$). Cyberloafing levels of male students ($\bar{X} = 94.20$) are statistically significantly higher than female students' ($\bar{X} = 85.78$) cyberloafing levels.

Table 5: Independent Sample t-Test Analysis Results on Cyberloafing Levels by Gender

	n	\bar{X}	SD	Df	t	p
Woman	203	85.78	18.67	301	-3.701	.001
Man	100	94.20	18.54			

3.2.2 Investigation of University Students' Cyberloafing Levels by Age

The age distribution of the participants was categorized in two groups as 17-21 and 22-26. Independent sample t-test analysis was performed to determine whether the levels of cyberloafing changed according to age groups (Table 6). The results of the analysis show that cyberloafing levels make a significant difference according to age ($t(301) = 3.451$, $p < .001$). The cyberloafing levels of the students in the 17-21 age category ($\bar{X} = 92.77$) are statistically significantly higher than the cyberloafing levels of the students in the 22-26 age category ($\bar{X} = 85.30$).

Table 6: Independent Sample t-Test Analysis Results on Cyberloafing Levels by Age

	n	\bar{X}	SD	Df	t	p
17-21	132	92.77	17.94	301	3.451	.001
22-26	171	85.30	19.23			

3.2.3 Investigation of University Students' Cyberloafing Levels by Grade Level

One-way analysis of variance (ANOVA) was performed to determine whether the cyberloafing levels of the participants changed according to the grade level (Table 7). Analysis results mean that there is a significant difference between cyberloafing levels in terms of class level ($F(3, 299) = 3.238, p < .05$). The effect size of this difference in the level of cyberloafing between the groups is small ($\eta^2 = .031$). According to the results of Scheffe test performed to examine the differences between grade levels, the difference between 2nd grade students ($\bar{X} = 94.62$) and 4th grade students ($\bar{X} = 88.56$) is statistically significant ($p < .05$).

Table 7: One-Way Analysis of Variance Results on Cyberloafing Levels by Class Level

	n	\bar{X}	SD	$F(3, 299)$	p
1 st Grade	48	87.90	20.90	3.238	.05
2 nd Grade	65	94.62	18.04		
3 rd Grade	20	90.55	19.87		
4 th Grade	170	88.56	18.35		

3.2.4 Investigation of University Students' Cyberloafing Levels by Grade Point Average

The grade point averages of the participants were categorized in three groups as 1.00 – 1.99, 2.00 – 2.99 and 3.00 – 4.00. ANOVA was conducted to determine whether the cyberloafing levels of the participants changed according to their grade point average (Table 8). Analysis results mean that there is no significant difference between cyberloafing levels in terms of grade point average ($F(2, 195) = .441, p > .05$).

Table 8: One-Way Analysis of Variance Results on Cyberloafing Levels by Grade Point Average

	n	\bar{X}	SD	$F(2, 195)$	p
1.00 – 1.99	14	90.07	18.30	.441	.64
2.00 – 2.99	94	92.46	18.88		
3.00 – 4.00	90	89.94	18.52		

3.2.5 Investigation of University Students' Cyberloafing Levels by Relationship Status

ANOVA was conducted to determine whether the cyberloafing levels of the participants changed according to their relationship status (Table 9). The results of the analysis mean that there is a significant difference between the levels of cyberloafing in terms of relationship status ($F(3, 299) = 19.013, p < .001$). The effect size of this difference in the level of cyberloafing between the groups is high ($\eta^2 = .16$). According to the results of the Scheffe test, which was conducted to examine the differences between the relationship status, the difference between single students ($\bar{X} = 88.44$), students who are in an ongoing relationship ($\bar{X} = 93.05$) and students who do not have an ongoing relationship ($\bar{X} = 95.61$) and married students ($\bar{X} = 70.23$). the differences are statistically significant ($p < .001$).

Table 9: One-Way Analysis of Variance Results on Cyberloafing Levels by Relationship Status

	n	\bar{X}	SD	$F(3, 299)$	p
Single	135	88.44	18.32	19.013	.001
Married	39	70.23	15.76		
Have an ongoing relationship	77	93.05	16.78		
Not have an ongoing relationship	52	95.94	17.64		

3.2.6 Investigation of University Students' Cyberloafing Levels by Faculty

ANOVA was conducted to determine whether the cyberloafing levels of the participants changed according to the faculties of education (Table 10). The results of the analysis mean that there is a significant difference between the levels of cyberloafing in terms of relationship status ($F(7, 294) = 9.875, p < .001$). The effect size of this difference in the level of cyberloafing between the groups is high ($\eta^2 = .19$). According to the results of the Scheffe test performed to examine the differences between the faculties of education, the differences between the students of the Faculty of Theology ($\bar{X} = 65.42$) and the other faculties are statistically significant ($p < .001$).

Table 10: One-Way Analysis of Variance Results of Cyberloafing Levels by Faculty

	n	\bar{X}	SD	F (7, 294)	p
Education	106	91.73	18.22	9.875	.001
Science – Literature	53	86.74	15.72		
Economics – Business	17	90.29	18.61		
Nursing	48	95.67	19.18		
Engineering	4	93.00	20.49		
Fine Arts	25	91.84	18.48		
Theology	31	65.42	11.33		
Conservatory	18	90.11	15.74		

3.2.7 Investigation of University Students' Cyberloafing Levels According to Foreign Language Knowledge

Data on whether the participants knew English, German and French were obtained. An independent sample t-test analysis was conducted to determine whether the cyberloafing levels of the participants changed according to whether they knew English or not (Table 11). The results of the analysis show that the levels of cyberloafing make a significant difference according to whether the participants know English or not ($t(300) = 3.330, p < .001$). The cyberloafing levels of the students who speak English ($\bar{X} = 89.86$) are statistically significantly higher than the cyberloafing levels of the students who do not speak English ($\bar{X} = 78.22$).

Table 11: Independent Sample t-Test Analysis Results on Cyberloafing Levels by English Knowledge

	n	\bar{X}	SD	Df	t	p
English Speaking	270	89.86	18.24	300	3.330	.001
No English Knowledge	32	78.22	22.26			

An independent sample t-test analysis was conducted to determine whether the cyberloafing levels of the participants changed according to whether they knew German or not (Table 12). The results of the analysis show that the levels of cyberloafing do not make a significant difference according to whether the participants know German or not ($t(300) = 1.187, p > .05$).

Table 12: Independent Sample t-Test Analysis Results Regarding the Levels of Cyberloafing by Knowledge of German

	n	\bar{X}	SD	Df	t	p
German Speaking	66	90.83	16.29	300	1.187	.287
No German Knowledge	236	88.01	19.69			

The Mann-Whitney U test was conducted to determine whether the cyberloafing levels of the participants changed according to whether they knew French or not (Table 13). The results of the analysis show that the levels of cyberloafing do not make a significant difference according to whether the participants know French or not ($Z = -1.071, p > .05$).

Table 13: Independent Sample t-Test Analysis Results on the Levels of Cyberloafing by Knowledge of French

	n	Rank Average	Rank Sum	U	p
French Speaking	11	179.18	1971.00	-1.071	.284

No French Knowledge	291	150.45	43782.00
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3.2.8 Investigation of University Students' Cyberloafing Levels by Daily Digital Tool Usage Time

The daily digital tool usage time of the participants was categorized into three groups as less than 2 hours, more than 2 hours – less than 4 hours and more than 4 hours. ANOVA was conducted to determine whether the cyberloafing levels of the participants changed according to the daily digital tool usage time (Table 14). The results of the analysis mean that there is a significant difference between the levels of cyberloafing in terms of relationship status ($F(2, 300) = 16.118, p < .001$). The effect size of this difference in the level of cyberloafing between the groups is high ($\eta^2 = .097$). According to the results of the Scheffe test, which was conducted to examine the differences between daily digital tool usage time, students with more than 4 hours of daily digital tool use ($\bar{X} = 94.92$) and students with more than 2 hours – less than 4 hours ($\bar{X} = 89.01$) compared to those with less than 2 hours. the differences between students ($\bar{X} = 78.92$) were statistically significant ($p < .001$).

Table 14: One-Way Analysis of Variance Results on Cyberloafing Levels by Daily Digital Tool Usage Time

	n	\bar{X}	SD	F (2, 300)	p
Less than 2 hours	71	78.92	21.17	16.118	.001
More than 2 hours – less than 4 hours	134	89.01	17.33		
More than 4 hours	98	94.92	16.77		

3.2.9 Investigation of University Students' Cyberloafing Levels by the Time of Starting to Use the Internet

The time when the participants started using the internet was categorized in three groups as Primary School and before, Middle School, High School and later. ANOVA was conducted to determine whether the cyberloafing levels of the participants changed according to the time they started using the internet (Table 15). The results of the analysis mean that there is a significant difference between the levels of cyberloafing in terms of relationship status ($F(2, 300) = 20.955, p < .001$). The effect size of this difference in the level of cyberloafing between the groups is high ($\eta^2 = .123$). According to the results of the Scheffe test, which was conducted to examine the differences between the times of starting to use the internet, the difference between the students who started to use the internet at and before primary school ($\bar{X} = 94.84$) and the students who were in middle school ($\bar{X} = 92.39$) compared to the students who were at high school and later ($\bar{X} = 79.46$). the differences are statistically significant ($p < .001$).

Table 15: One-Way Analysis of Variance Results of Cyberloafing Levels by Time of Starting to Use the Internet

	n	\bar{X}	SD	F (2, 300)	p
Primary school and before	75	94.84	16.65	20.955	.001
Middle school	124	92.39	16.68		
High school and after	104	79.46	19.97		

3.2.10 Investigation of the Cyberloafing Levels of University Students According to the Most Used Digital Devices

An independent sample t-test analysis was conducted to determine whether the cyberloafing levels of the participants changed according to the most used digital devices. It is seen that cyberloafing levels do not make a significant difference according to whether the most used device type is desktop computer or not ($t(301) = -.500, p > .05$). It is seen that cyberloafing levels make a significant difference according to whether the most used device type is laptop or not ($t(301) = 2.977, p < .05$). The cyberloafing levels of the students whose most used device type is laptop computer ($\bar{X} = 91.46$) are statistically significantly higher than the cyberloafing levels of the students who do not ($\bar{X} = 85.00$). It is seen that cyberloafing levels make a significant difference according to whether the most used device type is tablet computer or not ($t(301) = 2.286, p < .05$). The cyberloafing levels of students whose most used device type is tablet computer ($\bar{X} = 93.66$) are statistically significantly higher than the cyberloafing

levels of students who do not (\bar{X} = 87.35). It is seen that the levels of cyberloafing do not make a significant difference according to whether the most used device type is a smartphone ($t(301) = -.375, p > .05$).

3.3 Investigation of University Students' Life Goals According to Various Variables

Life goals of university students were examined according to gender, age, class, grade point average, relationship status, faculty of education, foreign language knowledge, daily digital tool usage time, age of starting to use the internet and digital devices used. The findings are presented below.

3.3.1 Investigation of University Students' Life Goals by Gender

An independent sample t-test analysis was performed to determine whether the life goals of the participants changed according to gender (Table 16). The results of the analysis show that life goals do not make a significant difference according to gender ($t(301) = -.190, p > .05$). There was no significant difference between male students' life goals (\bar{X} = 114.71) and female students' (\bar{X} = 114.36) life goals.

Table 16: Results of Independent Sample t-Test Analysis of Life Goals by Gender

	n	\bar{X}	SD	Df	t	p
Woman	203	114.36	13.13	301	-.190	.840
Man	100	114.71	15.68			

3.3.2 Investigation of University Students' Life Goals by Age

An independent sample t-test analysis was performed to determine whether the life goals of the participants changed according to age (Table 17). The results of the analysis show that life goals do not make a significant difference according to age ($t(301) = 1.885, p > .05$).

Table 17: Results of Independent Sample t-Test Analysis of Life Goals by Age

	n	\bar{X}	SD	Df	t	p
17-21	132	116.20	13.85	301	1.885	.060
22-26	171	113.15	14.01			

3.3.3 Investigation of University Students' Life Goals by Grade Level

ANOVA was conducted to determine whether the life goals of the participants changed according to the grade level (Table 18). Analysis results mean that there is no significant difference between life goals in terms of class level ($F(3, 299) = .508, p > .05$).

Table 18: One-Way Analysis of Variance Results Related to Class Level of Life Goals

	n	\bar{X}	SD	F (3, 299)	p
1 st Grade	48	115.3542	13.28171	.508	.677
2 nd Grade	65	114.8462	14.70250		
3 rd Grade	20	117.3500	12.21421		
4 th Grade	170	113.7529	14.17215		

3.3.4 Investigation of University Students' Life Goals by Grade Point Average

ANOVA was conducted to determine whether the life goals of the participants changed according to their grade point average (Table 19). Analysis results mean that there is no significant difference between life goals in terms of grade point average ($F(2, 195) = .551, p > .05$).

Table 19: One-Way Analysis of Variance Results on Grade Point Average of Life Goals

	n	\bar{X}	SD	F (2, 195)	p
1.00 – 1.99	48	116.86	16.78	.551	.577
2.00 – 2.99	65	114.38	14.64		
3.00 – 4.00	20	116.54	14.62		

3.3.5 Investigation of University Students' Life Goals by Relationship Status

ANOVA was conducted to determine whether the life goals of the participants changed according to their relationship status (Table 20). Analysis results mean that there is a significant difference between life goals in terms of relationship status ($F(3, 299) = 6.159, p < .001$). The effect size of this difference on life goals between groups was low (eta-square = .033). According to the results of the Scheffe test conducted to examine the differences between the relationship status; The differences between students ($\bar{X} = 119.46$) who do not have a lasting relationship compared to married students ($\bar{X} = 108.10$) are statistically significant ($p < .005$). The differences between students in a continuing relationship ($\bar{X} = 116.60$) compared to married students ($\bar{X} = 108.10$) were statistically significant ($p < .05$).

Table 20: One-Way Analysis of Variance Results on the Relationship of Life Goals

	n	\bar{X}	SD	F (3, 299)	p
Single	135	113.19	14.32	6.159	.001
Married	39	108.10	11.81		
Have an ongoing relationship	77	116.60	13.34		
Not have an ongoing relationship	52	119.46	13.63		

3.3.6 Investigation of University Students' Life Goals by Faculty

ANOVA was conducted to determine whether the life goals of the participants changed according to the faculties of education (Table 21). Analysis results mean that there is a significant difference in terms of life goals relationship status ($F(7, 294) = 4.083, p < .001$). The effect size of this difference on life goals between the groups was high (eta-square = .089). According to the results of the Scheffe test conducted to examine the differences between the faculties of education, the differences between the students of the Faculty of Theology ($\bar{X} = 106.19$), the students of the Faculty of Education ($\bar{X} = 116.95$) and the Faculty of Nursing ($\bar{X} = 118.54$) are statistically significant ($p < .005$).

Table 21: One-Way Analysis of Variance Results of Life Goals and Faculty

	n	\bar{X}	SD	F (7, 294)	p
Education	106	116.95	12.12	4.083	.001
Science – Literature	53	110.04	13.83		
Economics – Business	17	112.00	14.34		
Nursing	48	118.54	14.59		
Engineering	4	116.00	16.83		
Fine Arts	25	117.96	16.28		
Theology	31	106.19	11.03		
Conservatory	18	116.06	12.44		

3.3.7 Investigation of University Students' Life Goals According to Foreign Language Knowledge

An independent sample t-test analysis was performed to determine whether the life goals of the participants changed depending on whether they knew English or not (Table 22). The results of the analysis show that life goals make a significant difference according to whether the participants know English or not ($t(300) = 2.253, p < .05$). The life goals of students who speak English ($\bar{X} = 115.24$) are statistically significantly higher than the levels of life goals of students who do not speak English ($\bar{X} = 109.47$).

Table 22: Independent Sample t-Test Analysis Results Regarding Life Goals According to English Knowledge

	n	\bar{X}	SD	Df	t	p
English Speaking	270	115.24	13.55	300	2.253	.05
No English Knowledge	32	109.47	14.93			

An independent sample t-test analysis was conducted to determine whether the life goals of the participants changed according to their knowledge of German or not (Table 23). The results of the analysis show that life goals do not make a significant difference according to whether the participants know German or not ($t(300) = -.034$, $p > .05$).

Table 23: Independent Sample t-Test Analysis Results Regarding Life Goals According to Knowledge of German

	n	\bar{X}	SD	Df	t	p
German Speaking	66	114.58	13.46	300	-.034	.973
No German Knowledge	236	114.64	13.91			

The Mann-Whitney U test was conducted to determine whether the life goals of the participants changed depending on whether they knew French or not (Table 24). The results of the analysis show that life goals do not make a significant difference according to whether the participants speak French or not ($Z = -.839$, $p > .05$).

Table 24: Independent Sample t-Test Analysis Results Regarding Life Goals by Knowledge of French

	n	Rank Average	Rank Sum	U	p
French Speaking	11	129.82	1428.00	-.839	.401
No French Knowledge	261	152.32	44325.00		

3.3.8 Investigation of University Students' Life Goals According to Daily Digital Tool Usage Time

ANOVA was conducted to determine whether the life goals of the participants changed according to the daily digital tool usage time (Table 25). The analysis results mean that there is a significant difference between life goals in terms of relationship status ($F(2, 300) = 9.273$, $p < .001$). The effect size of this difference on life goals between groups was low (eta-square = .058). According to the results of the Scheffé test, which was conducted to examine the differences between daily digital tool usage time, students with more than 4 hours of daily digital tool use ($\bar{X} = 117.80$) and students with more than 2 hours – less than 4 hours ($\bar{X} = 115.32$) compared to those with less than 2 hours. the differences between students ($\bar{X} = 108.94$) were statistically significant ($p < .001$).

Table 25: One-Way Analysis of Variance Results for Life Goals by Daily Digital Tool Usage Duration

	n	\bar{X}	SD	F (2, 300)	p
Less than 2 hours	71	108.94	16.72	9.273	.001
More than 2 hours – less than 4 hours	134	115.32	12.15		
More than 4 hours	98	117.80	12.36		

3.3.9 Investigation of University Students' Life Goals by the Time of Starting to Use the Internet

ANOVA was conducted to determine whether the life goals of the participants changed according to the time they started using the Internet (Table 26). The analysis results mean that there is a significant difference between life goals in terms of relationship status ($F(2, 300) = 4.541$, $p < .05$). The effect size of this difference on life goals between groups was low (eta-square = .029). According to the results of the Scheffé test, which was conducted to examine the differences between the time to start using the internet, the differences between the students whose starting time to use the internet were in middle school ($\bar{X} = 116.56$) and those who were in high school and later ($\bar{X} = 111.36$) were statistically significant ($p < .05$).

Table 26: One-Way Analysis of Variance Results of Life Goals by Time of Starting to Use the Internet

	n	\bar{X}	SD	F (2, 300)	p
Primary school and before	75	115.92	13.08368	4.541	.011
Middle school	124	116.56	13.29607		
High school and after	104	111.36	14.38944		

3.3.10 Investigation of University Students' Life Goals According to the Most Used Digital Devices

An independent sample t-test analysis was conducted to determine whether the life goal of the participants changed according to the most used digital devices. It is seen that there is no significant difference according to whether the most used device type is desktop computer or not ($t(301) = -.121, p > .05$). It is seen that there is no significant difference according to whether the most used device type is laptop computer or not ($t(301) = 1.138, p > .05$). It is seen that there is a significant difference according to whether the most used device type is tablet computer or not ($t(301) = 2.443, p < .05$). The life goals of the students whose most used device type is tablet computer ($\bar{X} = 118.57$) are statistically significantly higher than the life goals of the students who do not ($\bar{X} = 113.69$). It is seen that life goals do not make a significant difference according to whether the most used device is a smartphone ($t(301) = -.094, p > .05$).

4. Discussion

In the present study, university students' life goals and cyberloafing profiles were examined in terms of gender, age, class year, GPA, relationship status, the faculty attended, knowledge of foreign language, duration of digital devices use a day, the age when they started to use the internet and digital devices used. According to the results, there is a positive and medium level correlation between students' life goals and cyberloafing levels. The study also investigated the correlation between cyberloafing levels and dimensions of Life Goals Scale. Accordingly, the results showed a positive and medium level correlation between cyberloafing levels and "physical appearance" and "financial income" dimensions while no correlation was found for "social responsibility", "personal awareness" and "personal development" dimensions. Some studies in the literature examining the variables related to cyberloafing also found medium level of cyberloafing in university students. Moreover, there are studies reporting that cyberloafing can correlate with various personal and environmental variables (Gezgin & Sarsar, 2020; Şenel et.al., 2019).

The study found a significant difference in participants' cyberloafing levels in terms of gender. Cyberloafing levels of male students were significantly higher than those of female students. Some studies dealing with this issue also report similar findings (Akbulut et.al., 2017; Dursun et.al., 2018; Lenhart, 2015; Lim & Chen, 2012; Şenel, 2019). The findings also revealed a significant difference in cyberloafing levels for age variable. Cyberloafing levels of the students at 17-21 age range were significantly higher than the levels of those at 22-26 age range. The study by Ekinici (2022) reported the presence of a significant difference between 18-19 and 22-23 age range in terms of social media use and Chou et al (2009) also found that social media use is more popular among young people. In parallel with this finding, the study showed a significant difference in cyberloafing levels in terms of class year. The difference between 2nd year students and 4th year students was also statistically significant. Young people are known to spend more time on the internet (We are social, 2022). As the results of the present study indicate, the increase in internet use correlates with cyberloafing.

How much time the participants spend using the digital devices in a day was grouped under three categories: less than two hours; more than 2 hours – less than 4 hours; and more than 4 hours. The study found a significant difference between the duration of time spent daily on digital devices and cyberloafing levels. The differences between the participants who use digital devices more than 4 hours a day - more than 2 hours and less than 4 hours a day were statistically significant than the participants who spend less than 2 hours a day on digital devices. Some studies in the literature also reported a correlation between duration of internet use and cyberloafing (Baturay & Toker, 2015; Gülnar, 2020; Karaoğlu-Yılmaz et.al., 2015; Lenhart, 2015; Lim & Chen, 2012; Şenel, 2019). However, not a significant difference was found between cyberloafing levels and GPA (grand point average). Although cyberloafing is generally considered a negative behavior, there are some studies emphasizing its positive

effects as well. Tan and Demir (2018) suggested that cyberloafing might be useful for both personal and institutional development when it assumes a facilitating role in learning. In addition, how much time students spend using digital devices significantly differs according to their life goals.

The results of the current study showed a significant difference in cyberloafing levels according to the participants' relationship status. The differences between married students and single students as well as those with an ongoing relationship and those who do not have any ongoing relationships were significant. Similarly, there was a significant correlation between life goals and relationship status. One of the categories for one's life goals is the presence of a relationship (Emmons, 1999; Wong, 1998). Therefore, relationship status of the participants is expected to differ according to life goals.

One of the results of the present study is the significant difference between the faculties attended according to both cyberloafing levels and life goals. Faculties preferred by students are somewhat related to their life goals (Şahin et.al 2011). Individuals' setting their life goals and doing their best to achieve them are clearly effective and significant factors (Myers and Deiner, 1995). Therefore, faculty preferences of university students can be considered a determining factor accordingly.

The present study performed analyses to determine whether cyberloafing levels of the participants differ according to their knowledge of English, German and French. The results showed a significant difference in their cyberloafing levels in terms of knowledge of English, while no significant differences were found for knowledge of German and French. The participant students who know English had significantly higher cyberloafing levels than those who do not know this language. English is the most widespread language used on the internet. According to the research by W3Techs, the content of more than 56% of the websites published on the internet is in English (Internet world stats, 2022). As students have better command of English, the number of platforms they can access via the internet also increases. Thus, knowledge of English can correlate with cyberloafing behavior. Similarly, life goals of students who know English were found to be significantly higher than those of the students who do not know English. According to Heady (2008), being successful is one of the basic life goals and knowledge of English can be evaluated in relation with this life goal.

The time when the participants started to use the internet were grouped under three categories: primary school and before; middle school; and high school and later. The study found a significant difference in participants' cyberloafing levels in terms of the time when they started to use the internet. The students who started to use the internet in high school and later significantly differed from those who started to use the internet primary school and before and middle school. Starting to use the internet at early ages seems to be a risk at later years in terms of internet addiction and cyberloafing (Kabasakal and Akada, 2018). It was also found that life goals significantly differ according to the time when participants started to use the internet. Similarly, the students who started to use the internet at middle school significantly differed from those who started to use the internet at high school. As class year increases, students set different life goals and develop different interests. Thus, life goals of the students who started to use the internet at early ages are expected to differ.

Finally, the study involved analyses focusing on the digital devices used in relation to cyberloafing levels. Cyberloafing levels did not differ according to whether the mostly used device is a desktop computer or smartphone; however, they differed according to whether the mostly used device is a laptop and tablet computer. The ratio of smartphone use in Türkiye is 77%, which is an important factor while interpreting the results of this study. The related studies found that widespread use of smartphones is related to increases in cyberloafing behaviors and mobile phone addiction (Gökçearslan et.al 2018). Life goals also significantly differed according to whether the mostly used device is a tablet computer or not. Another result of the study revealed that life goals of the participants did not significantly differ according to gender, age, class year and GPA. It might be assumed that the age range of the participants caused this situation.

The findings of the present study show a significant difference between cyberloafing profiles and life goals. In conclusion, it might be suggested that cyberloafing behaviors are quite widespread and might be examined in relation to various variables. Similarly, life goals have a multi-dimensional structure. Due to the limited number of studies dealing with cyberloafing and life goals, the results of the present study are remarkably noteworthy. It

will be useful to conduct more studies and duplicate the study with different age groups and by adopting different research models. Finally, both cyberloafing and life goals can be study topics for psychological guidance and counselling services

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Depression and Burnout Levels of Graduate Students in Music

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Abstract

At the end of the undergraduate process, many students dream of graduate school for self-improvement, career, or status. The idea of going to graduate school and the preparations for it are the beginning of a stressful period. The beginning of the courses, the long thesis writing process, and finally, a new scientific product defended is the end of this stressful period. In this process, many students struggle with psychological problems due to poor stress management. The study aims to determine graduate music students' depression and burnout levels. The data collection tools of the correlational survey design study were Beck Depression Scale (BDS) and Maslach Burnout Inventory-Student Scale (MBI-SS). The study group consisted of 236 graduate students in different departments and institutes in the field of music. According to the research results, it was determined that the general depression status of the students was at the level of moderate mood disturbance, and some groups were found to be at the level of clinical depression according to different variables. It was observed that the student's overall burnout levels were at a medium level, while they were at a low level in emotional exhaustion and depersonalization sub-dimensions. While the burnout levels of the students show a significant difference according to having children, educational status, work status, institutes, and departments, there is no significant difference according to gender, marital status, and age.

Keywords: Music, Graduate, Depression, Burnout, Students

1. Introduction

The most critical 21st-century requirement is the ability to keep up with the rapidly evolving and transforming conjuncture. A new application or method realized in any field is rapidly spreading globally. In this information age, rapidly increasing and spreading information has strengthened competition in business and professional life and made specialization even more critical. (Karaman & Bakırcı, 2010). Universities were established to meet society's need for scientific progress and highly qualified human resources. They have essential responsibilities such as conducting scientific research, producing knowledge and technology, disseminating scientific data, and contributing to national and universal development. Intertwined with society in every field, the university is at the highest level of the education system. While the duties of other system levels are to transfer existing knowledge, the university is mainly responsible for producing, disseminating, and utilizing knowledge (Tuzcu, 2003).

Individuals who complete their university education represent the trained human resources in the relevant field by the outcomes of the programs they study. After completing undergraduate education, individuals transition to postgraduate education per their wishes and tendencies. In the first stage, the person specializes in the relevant field with a master's degree and then a doctorate or proficiency in art education. Postgraduate education aims to

develop faculty members and researchers for higher education (Ünal & İlter, 2010) and to train individuals who can produce, use, criticize, and solve problems with their thinking (Alhas, 2006; Bozan, 2012). Graduate education is a prerequisite for development and progress in music, as in all fields of science. In its broadest sense, music science is a branch of science that systematically examines, researches, develops musical theories, and reports all kinds of music-related information with scientific methods using other disciplines (Karkın, 2021). It is an indisputable fact that music occupies a considerable place in life (Özengin et al., 2021). The most important feature that distinguishes students who continue their education in music-related disciplines from others is that artistic concerns are also involved in the process apart from the scientific process (Baydağ & Başoğlu, 2018; Öz, 2019). Although this anxiety is less pronounced in partly music theory fields, it is palpable in fields related to music performance. The leading causes of musical anxiety were identified as irrationality, perfectionism, or destructive cognition (Stephoe & Fidler, 1987; Tobacyk & Downs, 1986), physiological symptoms such as trembling and palpitations (Lehrer, 1987), and behavioral characteristics such as performance and audience avoidance (Clark & Agras, 1999). In addition to the problems mentioned above, graduate students in the field of music have to deal with common problems in producing a thesis. Research shows that students face many difficulties, such as job, advisor, colleagues, personal life, financial difficulties, and academic difficulties during the thesis writing process (Appel & Dahlgren, 2003; Wright, 2003; Akbulut et al., 2013; Koşar, 2021).

For some students, postgraduate study is an inspiring, attractive, and fulfilling process. For others, however, it is a time of personal sacrifice, divided lives, academic problems, lack of social support, and financial and psychological problems (Arastaman et al., 2020; Appel & Dahlgren, 2003; Jairam & Kahl, 2012; Protivnak & Foss, 2009; Temel & Doğan, 2017). Graduate students who face attrition, inadequacy, and burnout in this process and who intend to leave their programs should be able to cope with these difficulties and manage uncertainties at the beginning of their careers (Castello, 2017). Ülev (2014) mentions that it is inevitable for university students to experience depression, anxiety, and burnout as a result of the increase in stress levels they experience. Considering the difficulties experienced during the thesis writing process (Bahçeçi & Uşengül, 2018; Karadağ et al., 2018; Seçer, 2021; Özmen & Güçlü, 2013), it can be thought that it is inevitable for students who cannot manage this process well to experience depression and burnout. Literatürde stress, depresyon ve tükenmişlik düzeyi ile ilgili birçok çalışma vardır. These studies stated that it is necessary to manage stress before reaching the level of depression and burnout (Shapiro et al., 1998; Palmer & Rodger, 2009) and that the situation can be controlled with mindfulness meditations (Ramel et al., 2004; Temel et al., 2007).

Depression is one of the world's most common treatable medical problems, lasting at least two weeks and often longer, and significantly impaired functioning (Ülev, 2014). Depression is an emotional response to ongoing frustration and frustration. Its main characteristic is low self-esteem and mental breakdown (Köroğlu, 2006). It is widespread; its symptoms are many and complex, and it has symptoms that change with age. Depression can occur spontaneously, without a trigger, or as a result of another illness, due to drug use, alcohol use, postpartum, or as a reaction to a challenging life event (Polat & Coşkun, 2020; Aslan, 2018). Freudenberger first introduced the concept of burnout to describe a condition characterized by fatigue, frustration and quitting among volunteer health workers, and Maslach and Jackson later developed it (Freudenberger, 1974; Maslach et al., 1997). Maslach stated that long-term work stress led to burnout and defined it as a professional person's detachment from his profession's original meaning and purpose, not being able to care about the people he/she serves truly. Significant features of burnout include loss of energy, lack of motivation, negative attitude towards others, and actively withdrawing from others (Kaçmaz, 2005).

There are many studies on depression and burnout in the literature. The studies were mainly conducted in the fields of psychology and medicine (Arpacioğlu et al., 2021; Arslan et al., 2018; Alim, 2018; Tunç & Yapıcı, 2019; Tunçel & Süt, 2019). Regarding the field of education, self-esteem (Arslan et al., 2016), anxiety levels (Bozkurt, 2004), self-understanding (Deniz & Sümer, 2010), hopelessness (Çelikel & Erkorkmaz, 2008), physical activity (Yıldırım et al., 2015; Measurer et al., 2015), healthy life (Iskender et al., 2018), social intelligence levels (Doğan, 2006), social media addiction (Balci & Baloğlu, 2018), Covid-19 (Dikmen, 2021) and stress, locus of control (Akbağ et al., 2005) are available.

There are studies in the literature on music, depression, and burnout. Tuna et al. (2021) examined the effect of music listening preferences of university students on physical activity, depression, and sleep quality and concluded

that rap/hip hop listening provided positive support in three areas. Their study found that participants who received music education had higher levels of personal achievement and lower levels of depression scores, emotional exhaustion, and depersonalization than those who did not. Çolakoğlu and Çapan (2015) examined the burnout levels of music teachers and concluded that there was a significant decrease in teachers' emotional exhaustion and depersonalization scores.

Talışık (2016) stated that music teachers' perceptions of professional efficacy significantly affect their professional satisfaction and burnout. He also stated that they generally experience high burnout levels and feel most inadequate in the learning-teaching process. Kaleli (2021) examined the burnout level of music teachers in the Covid-19 process. The study concluded that teachers' burnout levels were moderate mood disturbance, and burnout levels showed significant differences according to gender, marital status, professional seniority, and school type.

It can be said that the stressful days that start at the entrance stage of graduate education reach the highest level with the course process, the qualification period, the reports of the thesis monitoring committees, and finally, the thesis defense. Students may even have to drop out of their programs in this challenging process. In its report published in 2021, the Council of Higher Education stated that 166,821 students, 147,771 master's and 19,050 doctoral students, were newly enrolled in graduate programs. The same report stated that 60,828 people graduated from master's programs and 7,589 from doctoral programs that year. Looking at the number of students who enrolled and graduated from the programs, it can be said that many students did not complete their programs for various reasons.

The primary purpose of the research is to determine the extent to which all these processes are reflected in the depression and burnout levels of graduate music students. In line with this purpose, the problem statement of the research was determined as follows: How are the depression and burnout levels of graduate students in the field of music? In order to better explain the main problem statement of the research, answers to the following sub-problem statements will be sought.

1. What are the depression levels of the students?
2. What are the burnout levels of the students?
3. Is there a significant relationship between students' burnout levels and their characteristics?
4. Is there a significant relationship between depression and burnout scores?

2. Method

2.1 Study Design

The study's design is a relational survey model examining graduate students' depression and burnout in music. In correlational survey models, the aim is to determine the existence and degree of change between two or more variables. In correlation-type relationship studies, it is tried to learn whether the variables change together or not and, if there is a change together, how it happens. Determining the relationships between variables allows researchers to make predictions about variables (Karasar, 2006; Büyüköztürk et al., 2022).

2.2 Participant

The study group consisted of 236 graduate students who were continuing their master's, doctorate, and proficiency in art education in the field of music in Turkey. Descriptive data of the study group are presented in the table below.

Table 1: Study group

	Group	n	%
Gender	Female	127	53,8
	Male	109	46,2
Age	20-24	74	31,4
	25-28	55	23,3

	29-32	35	14,8
	33- ...	72	30,5
Marital Status	Single	159	67,4
	Married	77	32,6
Education Status	Master Degree	154	65,3
	Ph. D.	70	29,6
	Proficiency in Arts	12	5,1
Having Children Status	Yes	81	34,3
	No	155	65,7
Working Status	Full Time	140	59,3
	Part Time	39	16,5
	Not Working	57	24,2
Institute	Educational Sciences	98	41,5
	Fine Arts	10	4,2
	Social Sciences	28	11,9
	Graduate School	74	31,4
	Music and Fine Arts	26	11
	Music Education	105	44,5
Program	Turkish Music	63	26,7
	Music Performance	44	18,6
	Musicology	8	3,4
	Music Technologies	6	2,5
	Music Theory	5	2,1
	Opera Vocal	5	2,1

As seen in Table 1, the majority of the participants are female. In the age range, 20-24 and 33+ are the most crowded group. Most participants were single, did not have children, were master's students, and actively worked full-time jobs. Most participants (41.5%) are students of the Institute of Educational Sciences and, therefore, of the music education program.

2.3 Data Collection

Researchers need to recognize the characteristic they want to measure well and proceed accordingly (Demirtaş & Özçelik, 2020). In the study, data on the participants' gender, age, marital status, educational status, having children, employment status, institutes, and programs were collected through the "Personal Information Form" developed by the researcher. The questionnaire study can provide definitions by collecting information about demographic characteristics, knowledge, and attitudes (O'Leary, 2017). Attitudes are tendencies that are attributed to an individual and form his/her thoughts, feelings, and behaviors about a psychological object in a traditional way (Kağıtçıbaşı, 2010).

Two data collection tools adapted to Turkish were used in the study. Beck Depression Scale (BDS) was used to determine the level of depression, and Maslach Burnout Inventory -Student Scale (MBI-SS) was used to determine the level of burnout. Permission was obtained from the relevant researchers before the scales were used.

Beck and colleagues developed Beck Depression Scale (BDS) in 1961 to measure behavioral symptoms of depression in adolescents and adults (Beck et al., 1961). In 1978, the scale was revised, duplications defining severity were removed, and patients were asked to mark their condition for the last week, including the present (Guy, 1976). Hisli (1989) and Avşar (2007) conducted Turkish validity and reliability studies of the scale. It is a rating scale consisting of 21 questions and calculated by summing the scores between 0-3 from each answer. Scale values align with the corresponding score ranges 1-10 normal, 11-16 moderate mood disturbance, 17-20 clinically depressed, 21-30 moderately depressed, 31-40 severely depressed, and 41-63 severely depressed (Cihan, 2011). As in the original scale, it consists of 21 items and four sub-dimensions. Avşar (2007) calculated the Cronbach alpha coefficient as .86. In this study, the value is .89.

Maslach Burnout Inventory -Student Scale (MBI-SS) was created by Schaufeli et al. in 2002. Its adaptation into Turkish was made by Çapri et al. (2011). It shows that the 13-item, 3-factor Turkish version of the scale can be used reliably on the university student population (Çapri et al., 2011). The 13-item scale is an adaptation of the general form of the Maslach Burnout Inventory for students (Kaya, 2009). The scale consists of three sub-dimensions: emotional exhaustion, depersonalization, and competence. The scale adaptation study was conducted with 782 students, and exploratory factor analysis, confirmatory factor analysis, and test-retest analyses were used. Cronbach alpha coefficient of the scale is .91. The reliability coefficients of the factors are as follows: Emotional Exhaustion .76, Depersonalization .74, and Competence .73. In this study, it was calculated as .65 for the first factor, .64 for the second factor, .71 for the third factor and .74 for the overall scale.

2.4 Data Analysis

The data collected online were entered into the SPSS 26 program. In order to determine the statistical tests to be performed, the data were first checked for normality. For this, normality tests, skewness, and kurtosis values were checked.

Table 2: Normality test results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Depression	.179	236	.000	.870	236	.000
Burnout	.182	236	.000	.909	236	.000

When the normality test results were examined, it was determined that the data did not show normal distribution ($p < .05$). For this reason, Mann Whitney U test and Kruskal Wallis tests, which are non-parametric, were used in the rest of the study. The Mann-Whitney U test is used to test the null hypothesis that "two independent samples come from the same population" without having to assume that the populations from which the sample is drawn are normally distributed (Miller & Miller, 2003).

3. Finding

The findings obtained from the research are explained in order according to the sub-problems. The first sub-problem is as follows "What is the level of depression of the students?" The findings are given in the table below.

Table 3: Beck depression levels

	Group	n	%	Beck result
Gender	Female	127	53,8	11,63
	Male	109	46,2	7,68
Age	20-24	74	31,4	10,32
	25-28	55	23,3	5,73
	29-32	35	14,8	11,8
	33- ...	72	30,5	14,04
Marital Status	Single	159	67,4	7,97
	Married	77	32,6	15,84
Education Status	Master Degree	154	65,3	7,75
	Ph. D.	70	29,6	16,4
	Proficiency in Arts	12	5,1	13,73
Having Children Status	Yes	81	34,3	16,54
	No	155	65,7	4,83
Working Status	Full Time	140	59,3	5,61
	Part Time	39	16,5	10,56
	Not Working	57	24,2	19,1
Institute	Educational Sciences	98	41,5	18,86

Program	Fine Arts	10	4,2	7,19
	Social Sciences	28	11,9	12,27
	Graduate School	74	31,4	13,09
	Music and Fine Arts	26	11	12,29
	Music Education	105	44,5	17,09
	Turkish Music	63	26,7	15,3
	Music Performance	44	18,6	11,16
	Musicology	8	3,4	9,32
	Music Technologies	6	2,5	7,97
	Music Theory	5	2,1	14,97
	Opera Vocal	5	2,1	3,14
	Total			11,5

According to the depression scale scores applied to the students, the total score obtained was 11.5. This scoring range indicates that the students have a moderate mood disturbance (Cihan, 2011; Ulaş et al., 2015; Geroğlu et al., 2016; As, 2015).

According to the gender variable, males showed normal symptoms (7.68), while females had moderate mood disturbance (11.63). In the age ranges of 20-24 (10.32), 29-32 (11.8), and 33+ (14.34), moderate mood disturbance was observed, while the values were normal in the 25-28 (5.73) age range. In marital status, those living alone showed normal values (7.97), while the proportion of married people almost reached the clinical depression indicator (15.84).

Across program levels, doctoral students were clinically depressed (16.4). Proficiency in art students was at a moderate mood disturbance (13.73), while master's students were at a normal level (7.75). Students with children were clinically depressed (16.54), while those who did not have children were at a normal level (4.83). When the employment status was analyzed, it was determined that students who were not employed were clinically depressed (19.1). Those working part-time had moderate mood disturbance (10.56), while those working full-time had normal levels (5.61).

When the depression levels according to the institutes are examined, educational sciences are clinically depressed (18.86), while social sciences (12.27), postgraduate education (13.09), and music and fine arts (12.29) institutes are at a moderate mood disturbance. The depression level of fine arts institute students is normal (7.19). In the departments of Turkish music (15.3), music performances (11.16), and music theory (14.97), students have moderate mood disturbance. Music education students were observed to be clinically depressed (17.09). Students in the musicology (9.32), music technology (7.97), and voice education (3.14) departments had normal levels. The findings related to the second sub-problem, "What are the burnout levels of the students?" are shown in Table 4.

Table 4: Maslach burnout levels

	n	Minimum	Maximum	Mean	Std. Deviation
Emotional exhaustion	236	1.2	4.2	2.4	.707
Depersonalization	236	1.00	4.5	2.55	.739
Competence	236	1.75	4.25	2.91	.508
Total	236	1.77	3.85	2.61	.556

The overall mean score of students' burnout levels is 2.61. This result is the value where the score range of 2.61-3.40, which is accepted as the middle level, starts. The burnout levels of graduate students studying in the field of music are at a medium level. In the factors, emotional exhaustion (\bar{x} :2.4) and depersonalization (\bar{x} :2.55) are low, and competence (\bar{x} :2.91) is at a medium level.

The findings related to the third sub-problem, "Do students' burnout levels differ according to their demographic characteristics?" are shown in Table 5.

Table 5: Mann-Whitney U test for the gender and status (Maslach)

		Maslach Burnout Scale			
	Group	n	Emotional exhaustion	Depersonalization	Competence
Gender	Female	127	.221	.039	.090
	Male	109			
Marital Status	Single	159	.793	.709	.302
	Married	77			
Having Children Status	Yes	81	.001	.354	.685
	No	155			

Table 5 compares students' burnout scale scores according to gender, marital status, and having children. No significant difference was found in the overall scale scores. In the sub-dimensions, a significant difference was found in the emotional exhaustion dimension of the variable of having children ($p=.001$).

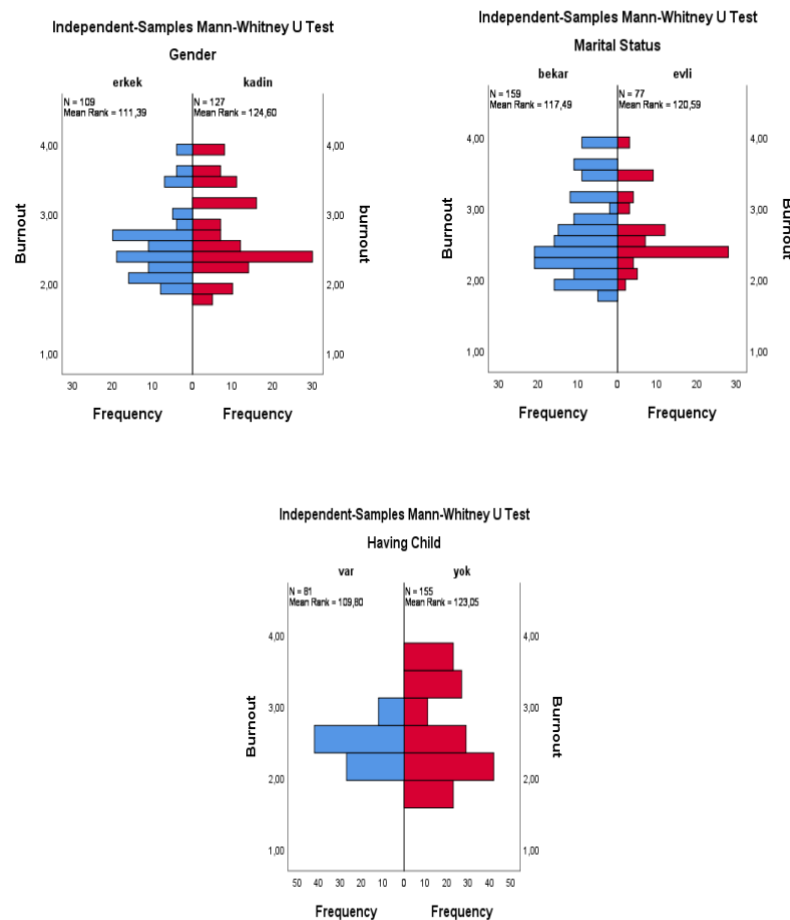


Figure 1: Mann-Whitney U results

Kruskal Wallis test was applied to determine whether there was a difference between students' age, educational status, study, institute, and department. In order to reveal significant differences between groups, the Mann-Whitney U test was applied between paired groups.

Table 6: Kruskal Wallis test for the age, status, institute and program (Maslach)

	Maslach Burnout Scale			
	Emotional exhaustion	Depersonalization	Competence	p
Age	.024	.859	.042	.683
Education Status	.167	.491	.005	.001
Working Status	.002	.007	.092	.012
Institute	.000	.000	.001	.000
Program	.000	.001	.000	.000

There is no significant difference in the overall scale and sub-factors in the age variable ($p=.683$). There are statistically significant differences in the variables of educational status ($p=.001$), employment status ($p=.012$), institute ($p=.000$), and department ($p=.000$). The first difference is in the competence sub-factor within the educational status ($p=.005$). A significant difference was found between proficiency in art students and doctoral students ($p=.001$).

There is a significant difference in emotional exhaustion ($p=.002$) and depersonalization ($p=.007$) sub-factors in the employment status variable. In the dimension of emotional exhaustion, there is a difference between non-workers and full-time employees ($p=.001$); in the factor of depersonalization, there is a difference between non-workers and part-time employees ($p=.003$).

There is a statistically significant difference in the institute and department variables. Graduate institute scores showed a significant difference in the emotional exhaustion dimension compared to the others ($p=.001$, $p=.000$, $p=.000$, $p=.000$, $p=.004$). In the depersonalization factor, there is a significant difference between graduate institute-educational sciences ($p=.000$) and graduate institute-fine arts institute ($p=.001$). The difference in the competence factor is between music and fine arts-educational sciences ($p=.004$).

When the relationship between departments was analyzed, it was determined that there were significant differences between music theory and Turkish music ($p=.001$), music theory and music education ($p=.003$), music performances and music education ($p=.000$), and music performances and voice education ($p=.003$).

The findings of the last sub-problem, "Is there a significant relationship between depression and burnout scores?" are given below.

Table 7: Spearman's test result

		Depression	Bournet
	Correlation Coefficient	1.000	.450**
Depression	Sig.	.	.000
	n	236	236
Bournet	Correlation Coefficient	.450**	1.000
	Sig.	.000	.
	n	236	236

**Correlation is significant at the 0.01 level.

Spearman correlation analysis results are shown above. In the results of the analysis, it was concluded that there was a significant relationship between students' depression scale scores and burnout scale scores.

4. Results and Discussion

The study aimed to determine music graduate students' depression and burnout levels. The study group consisted of 236 graduate music students.

First, the depression levels of the students were determined. The general depression score of 236 students was calculated as 11.5. This score indicates that the students have moderate mood disturbance. In many different studies, it has been determined that the general depression levels of university students are at moderate levels. (Ulaş et al., 2015; Bozkurt, 2004; Deniz & Sümer, 2010; Çelikel & Erkorkmaz, 2008). The depression level of male students was low (7.68), while that of female students was moderate (11.63). Studies in the field support that gender reveals a significant difference in depression (Taytaş & Kardaş, 2022; Özdemir, 2019; Ünal et al., 2002; Akça et al., 2018; Ayas, 2014; Karamustafaalioglu et al., 2004; Baştuğ & Çumraligil, 2004). Although some studies have found that males have higher levels of depression, it can be said that females have higher levels of depression than males.

The study found that students aged 33 and over had the highest level of depression. Studies show that advancing age and stressful life are parallel to depression (Genç et al., 2022; Önal, 2022). The most challenging and complex level of postgraduate education is the doctoral level. The difficulties experienced in this process were reflected in the study's findings. Doctoral students were found to be clinically depressed—studies on the difficulties of the process support this finding (Özmen & Güç, 2013; Sever & Ersoy, 2017; Karadağ & Özdemir, 2017). Students who had children were found to have higher levels of depression. When we consider the time and opportunities parents can allocate to areas such as social, educational, career, and personal development (Tezel & Cevher, 2007), it can be said that the child brings restrictions in many areas of life (Mercan & Şahin, 2017). The responsibility of having children appear to be a factor that increases the depression levels of undergraduate students.

In the postgraduate process, students need support at many points. In this process, in which many sacrifices are made spiritually, financial support is also needed (Aslan, 2007). Students who need more financial support have difficulties in this process and need help to complete their education (Özmen & Güç, 2013). The results obtained from the study are in line with these findings. Students who were not employed were found to be clinically depressed. When the effect of institutes on depression levels was analyzed, it was found that the students of educational sciences institutes were clinically depressed. Similarly, the depression levels of music education students were found to be at the clinical level. This study, conducted among various departments related to the field of music, shows that educational sciences students have higher levels of depression than other students.

It was determined that the general burnout scores of the students were at a moderate level (2.61). This value is at a critical threshold. In this measurement, where the range of 1.81-2.60 points was determined as low level and the range of 2.61-3.40 as medium level, the student's scores increased to the medium level with .1 point. The averages are low in emotional exhaustion and depersonalization sub-dimensions. Maslach et al. (1997) explain emotional exhaustion as a decrease in the emotional and physical resources of the individual. The development of negative attitudes towards work and loss of energy are among the symptoms of emotional exhaustion. Emotional exhaustion is necessary, but more is needed for burnout. Emotional detachment from work due to excessive workload can be considered a prerequisite for depersonalization (Karaaslan et al. 2020). Considering that the emotional exhaustion experienced by the students is related to the learning process, graduate students feel a high level of exhaustion in this sense. The results found for the depersonalization dimension are also low. The depersonalization dimension is considered a reaction to emotional exhaustion (Maslach et al., 1997). Dolunay (2002) explains depersonalization as an individual displaying attitudes and behaviors in a callous manner without considering those affected by the work. Studies show that the depersonalization factor progresses in parallel with the emotional exhaustion factor and that these two factors are at the same levels in determining burnout. The results obtained from the study also bear this similarity.

When we look at different studies conducted in universities, the general burnout level rates are similar to this study (Gündüz et al., 2012; İn & Kula, 2019). It was concluded that exhaustion did not differ significantly on gender, age, and marital status. Significant differences exist in having children, education level, employment status, institute, and department. These results show that burnout is experienced in areas with high levels of depression. There are studies in the literature that gender and age factors do not create a significant difference in burnout (Yenihan et al., 2018; Çapulcuoğlu & Gündüz, 2013). A significant difference was found in the emotional exhaustion dimension of students who had children. Kılıç and Seymen (2011) determined the individual and social causes of burnout as having children and the number of children, over-commitment to work, ego of the individual, personal expectations, and work-related stress. It can be concluded that having children may cause emotional

burnout during graduate education. It was also concluded that students who were not working in any job and had no income also experienced emotional burnout.

Significant differences were found in burnout levels between institutes and departments. Students in educational institutes differed from students in other institutes in all sub-factors. The data obtained from the students in the music theory and music performance departments constitute significant differences.

The research results show that variables with high levels of depression also have high levels of burnout. When the studies in the literature were examined, it was seen that the results obtained from the research overlapped. Based on these results, the suggestions listed below should be considered by all other graduate students in the field of music and by educators involved in the education and training process.

- The advisor-student relationship is the most crucial relationship in which personal intimacy is observed in the graduate education process. For this reason, advisors should observe how their students manage stress while ensuring their academic development. Beyond academic studies, the faculty member who detects a difference in his/her student's behavior or attitudes should provide the necessary guidance when receiving psychological support. In order to increase the awareness of faculty members on this issue, various pieces of training should be given to faculty members who are thesis advisors. This study, in which it was determined that various variables increase depression and burnout levels, is a study in which faculty members can observe their students.
- There are psychological guidance and counseling centers within universities that continue to work actively and that students benefit from free of charge. Department heads should ensure that students benefit from these units.
- Advisors should be actively involved from the beginning to the end of graduate education. Experts should inform students about the program's requirements and the process's psychological effects.
- Students who document their depression or burnout through official health institutions should be given additional time.
- Students' depression and burnout levels should be measured once a year, and the results should be shared with the heads of the relevant departments. In this way, the support students need can be provided.

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Purposes of Code-Switching in Turkish Preparatory Classes: An Action Research

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Abstract

Classroom interaction is a vital factor for teaching and learning second language. Numerous studies were conducted by researchers to shed a light on different aspects of this concept. Many different features of classroom interaction were dealt with researchers such as feedback, questioning, concept checking. Code-switching during the lesson is one of that features. It has been a widely debated topic for researchers. For this reason, the aim of this action research is to see the L1 amount and purposes in a preparatory class. Results indicated that 4/1 lesson time was spent with L1 and teacher used L1 for different purposes such as increasing motivation, increasing comprehension, humor, and building personal relationships

Keywords: Code-Switching, ELT, L1 Use, Motivation, Comprehension

1. Introduction

1.1 Classroom Interaction

Classroom interaction is the dialog between students and teachers in the classroom (Tsui, 2001). According to the Kumpulainen & Wray (2015), researcher started to begin conducting studies about social interaction of the classroom in 1950s and 60s. They claim that whole class interaction between pupils and teacher was the main focus in the early phases of educational oriented researches into classroom interaction. However, Tsui (2001) says that more recent studies about the classroom interaction have begun to focus on to reveal underlying factors that shape the interaction in the classroom. According to the Tsui, teacher and learner beliefs, teacher and students' cultural background, and language learning's psychological aspects are the common studies that focused on and they provide more extended knowledge about the complexity of the classroom interaction. Cazden (1988) claims that results of classroom interactions studies indicated that there were typical classroom interaction patterns. It was Initiation-Response-Feedback/Evaluation (IRF/E) sequence. Waring (2009) states that in this pattern teacher controls the structure and content of the classroom interaction. According to him, in IRF pattern, teacher initiates the dialog by posing questions, then student responses to this question. Finally teacher gives feedback and it finishes the interaction.

Tsui (2001) points that students are persistent questioners, that is, they ask many questions to learn and explore the world around them. They not only learn to talk but also talk to learn. However, according to the studies, number of questions that they ask decrease markedly when they enter the classroom. For this reason, conducting research about classroom interaction and giving importance to this concept plays a crucial role for teaching and learning second language. According Dagarin (2004) classroom interaction plays an important role in language learning. He points the importance of classroom interaction in the following lines. Classroom interaction;

- is effective for communication in target language
- is beneficial since it give metalanguage for communication in cultures.
- is helpful for engaging target language texts
- is helpful for deeping the understanding of cultural and social norms

There are different aspects that can be discussed in the concept of classroom interaction such as feedback, questioning, concept checking, and code-switching (Farrell, 2009). In this action research, code-switching or in other word L1 use in the classroom was discussed. According to the Sert (2005), code-switching is widely observed fact in multilingual societies and it is alternation between languages. Code-switching is used in teachers' and students' discourse in ELT classrooms. Using code-switching, its necessity, and roles have been widely discussed when we look at the literature. On literature some studies are not favor of using code-switching in the classroom (Kharma & Hajjaj, 1989; MacDonald, 1993; Turnbull & Arnett, 2002). They believe that only the target language should be used in the classroom. L1 use effects competence in a bad way. On the other hand some studies supports using code-switching in the classroom in the literature (Harbord, 1992; Macaro, 2005).

1.2 Code Switching

Various researchers suggest different functions for code-switching in the classroom. For conceiving this classroom interaction feature better, it is necessary to focus on them. Sali (2014) states that teachers used L1 for three different purposes. They used L1 "to communicate the content of the lesson (Academic), to regulate classroom interaction for efficient lesson flow (Managerial), and for rapport construction (Social/Cultural)" (p 317). Atkinson (1992) suggests that L1 has necessary roles for lead-ins, eliciting language, giving instructions and checking comprehension. On the other hand Macaro (2000, cited in Macaro, 2005) code-switching may be used for different purposes such as building personal relationship with learners, giving complex instructions, controlling students' behaviors, translating and checking understanding to eliminate time limits, teaching grammar explicitly.

Like it was mentioned previously, code-switching has been a widely debated subject in the literature. For further discussions, looking at the different studies related to this concept would be beneficial. Alshammari (2011) conducted a study to see the aim of L1 use and the attitudes of Saudi teachers and students towards Arabic in the EFL classrooms. Results indicated that nearly all of the Arabic teachers who participated in the study used L1 in their classrooms. Questionnaire results showed that students and teachers had positive attitudes towards code-switching in the classroom. Additionally, results revealed that L1 was used for clarification purposes. Alshammari suggests that code-switching can be useful for language learning and it can increase learners' comprehension. Carson & Kashihara (2012) conducted a study with senior and 2nd year university students in the Japan. They compared students' beliefs about L1 use in the classroom with their TOEIC proficiency scores. Results showed that senior students prefer to count on L1 when it is compared with the advanced students. According to the Carson & Kashihara, if students want to make cognitive addition in a quicker way, they should connect L2 to their L1. Another study to see the Iranian students' attitudes towards using L1 was conducted by Nazary (2008). Participants were students at Tehran University and their mother tongue was Farsi. Results showed interesting facts about L1 use. Participants didn't want to use L1 in the classroom and they strongly rejected to use it for better L2 competence. According to Nazary this results were inconsistent with the other studies.

1.3 Relevant Studies

It is also necessary to review the literature about this topic in Turkish context since the data used in this action research was gained from a Turkish classroom. Kayaoğlu (2012) conducted a study with 44 teachers of English in Turkey. He used questionnaire and semi-structured interview for collecting data. Results indicated that teachers of English in Turkey used L1 for pragmatic and practical purposes. Teachers used code-switching for motivational

factors. They believed that teachers who used Turkish would be more motivational than the one who uses only target language in the classroom. In the interviews some teachers answered that they use L1 because it is helpful for simplify the subjects, supports classroom management and warms up the relationship between the students and teachers. Nearly all of the teachers believed that students can use their first language. However, it may change according to the lesson and their levels. Teacher believed that students' using L1 would be more effective rather than staying silent. On the other hand Kafes' (2011) study shows that Turkish teachers use L1 for different purposes. They mostly used L1 for to ask relevant questions to the course or lesson, to explain unknown items and vocabulary, to tell a joke. In line with the related literature, this present study aimed at investigating the code-switching examples in a preparatory class in an action research type. Present study also aimed to find significant answer for the following research questions.

How much amount of lesson time was reserved for code-switching?

What were the purposes of code-switching in lesson time?

2. Method

2.1 Participants

Totally 24 students participated in this action research. Participants were at a preparatory class at Uludag University School of Foreign Languages in Bursa/Turkey. They were at elementary proficiency level and they had been taking that course for 7 months. Students were young adults and their ages ranged from 18-25. In Turkey before starting the actual programs, students may take preparatory classes at their university. For some program preparatory classes may be elective and for some programs may be compulsory. Students are arranged to the different proficiency classes according to their placement scores. They take this preparatory classes for academic and communicative purposes.

2.2 Data Collection and Analysis

Some classroom times were audio-recorded during the research. However, classroom and students wasn't researcher's own classroom and students. Researcher audio-recorded a teacher's classroom interaction at the Uludag University School of Foreign Languages. Recording data was turned into a transcript. It was a main course lesson and topic was 'Dream Catchers'. During the lesson students listened, read some texts related to the topics. Teacher wanted them to answer some questions in the book. Teacher also wanted them to talk about their experiences and beliefs about that particular topic. Finally, these recording data were analyzed by considering the L1 use concepts. Researcher categorized the data according to the Sali's (2014) and Macaro's (2000, cited in Macaro 2005) statements about roles of code-switching in the classroom such as academic purposes, building personal relationships etc.

3. Results

Two lesson times were recorded and turned into a transcript (approximately 60 minutes). Results showed that teacher used L1 for nearly 15 minutes (1/4) of the lesson. Not only teacher but also students used L1 during the lesson time. It means that like Alshammari's (2011), Carson & Kashihara's (2012), Kayaoğlu's (2012), and Kafes' (2011) studies, teacher was in favor of using L1 in the classroom. On the other hand results showed contradiction with Nazary's (2008) study which states that Iranian students were reluctant to use L1 in the classroom. Students in the study preferred to use L1 from time to time. As Carson & Kashihara' (2012) study revealed students preferred code-switching since they were at elementary level. For clear implementation some extracts from the data which showed importance may be given.

Extract 1

Teacher: Everybody look wonderful. Today it is a special day for our women. Gerçekten bugün neşeli görünüyorsunuz (You look really wonderful today). Kadın arkadaşlarımızın kadınlar gününü kutlarım (I celebrate Women's Day of our women friends.)

Class: Teşekkürler hocam (Thank you teacher).

As it can be seen in the first extract teacher used L1 for celebrating a special day for women. This result showed that teacher used L1 for building relationships with students as Macaro (2000, cited in Macaro, 2005) stated. Since this code-switching was at the beginning of the lesson, it can be said that teacher used L1 for warming-up purpose as Kayaoğlu's (2012) study showed. On the hand, as Sali (2014) pointed teacher used L1 for social/cultures issues.

Extract 2

Teacher: Arkadaşlar galiba biraz anlamakta sorun oluştu. Dream catchers ne demek tam olarak anlayabildiniz mi? (I think it was a bit complicated for you. Did you understand what dream catcher means exactly?)

A student: Rüya yakalayıcısı hocam. (They are catching the dreams teacher)

Teacher: Tam olarak öyle değil. Dream catcher bizdeki nazar boncuğu gibi bir şey. İnsanları kötü rüyalarından koruduğuna inanılan bir şey. (Not exactly. It is like a blue bead in our culture. It is believed that dream catchers protects us from evil nighmares)

Students: Anladık hocam (We got it).

When we look that the second extract, students had some difficulty about comprehending the topic clearly. Teacher used L1 in here for clarification purposes. Students' comprehension increased with this code-switching and they answering performance changed positively at later exercises. This results showed relevance with Alshammari's (2011) results which stated that L1 would increase students' comprehension.

Extract 3

Teacher: En son rüyanda ne görmüştün Salih. Söyleyebilir misin. (What was your last dream about Salih? Can you tell us?)

A Student: Hocam tam hatırlamıyorum ama galiba telefonumla alakalı bir şey görmüştüm. Telefonum kırılıyordu aslında rüya değil de kabustu (I don't remember it exactly, but I think it was about my smart phone. My phone was broken. Actually it wasn't a dream it was a nightmare. And whole class laughs)

Teacher: Anladım harbiden kâbusmuş. Başka var mı rüyasını anlatmak isteyen. (I see. It was really a nightmare. Anyone wants to tell us his dream?)

Results of Kafes' (2008) study indicated that %6.4 L1 use was for the purpose of the humor and joke. As it is shown in the extract, results showed relevance with that study.

Extract 4

Teacher: (Looks at the attendance sheet) Now let go on. Bu arada Ahmet Tekin burada mı yoksa ben mi göremiyorum. İmzası var burada da. İki ders burada görünüyor. (By the way, Is Ahmet Tekin here? I see his signature on attendance sheet)

Student: Ahmet Selçuk olmasın hocam. (Should it be Ahmet Selçuk?)

Teacher: Yok Ahmet Selçuk'un da imzası var. Şimdi Ahmeti alana diğer Ahmet bedava mı olmuş. Güzel. Ben bunu diğer sınıflarda gördüğümde o arkadaşım, imza atan, gelsin benden özür dilesin diyorum. Bir şekilde konuyu kapatıyoruz yoksa disiplinlik bir konudur bu. Ama kendi sınıfında bunu yapmıyacağım. Kendi sınıfımda tepkim daha sert olacak. Bundan sonra Cuma öğleden sonra blok ders yok ilk yaptırımım bu. Çünkü bu iyi niyetimi suiistimal etti. Hoş bir şey değil. Çok üzıldüm şu anda. (No it is not. I think someone signed instead of him. Look guys it is serious issue. There will be some sanction for this disrespect. It is not a good think. I am very sorry about it.)

During the flow of the lesson a serious event happened. When we look at the extract we clearly can see that teacher expressed his feelings in L1. Teacher might wanted to use L1 directly since it was a serious classroom management issue. Kayaoğlu (2012) stated that teachers may use L1 for serious classroom management issues since it helps teachers to express his feeling clearly. Additionally, results showed resemblance with Sali's (2014) statement which tells that teacher may use L1 for managerial issues.

Extract 5

T: (Reads the text aloud) If you dance, if sing if you smile, this is good for your mind and psychology. O zaman bugün kadınlar günü hadi gülün gülün. Gül Emre, gül Büşra, Gül hakan gülün gülün. (Then today is women's day. Come on smile, smile, smile. smile Emre, smile Büşra, smile Hakan smile, smile, smile)

Class Laughs

Flow of lesson may be spoiled some classroom management problems. At that point a teacher should treat the problem appropriately. An attendance problem happened previously on the lesson and it effected students' motivation and mood. Results showed that teacher tried to eliminate these negative mood and tried to increase motivation. Kayaoğlu's (2012) study revealed that L1 speaking teacher were more motivational than the other. As we can see the extract teacher used L1 with humor and it cleaned up negative mood and increased students' motivation.

4. Discussion

In this action research, a particular lesson time was recorded and analyzed according to the concepts of code-switching during the lesson. Different types of results were founded. First of all, results indicated that teacher and students gave importance to the L1 use. They code-switched when it is necessary. Secondly, as literature stated, teacher used L1 for different purposes such as increasing motivation, increasing comprehension, checking understanding, and building personal relationships. Some reflections about this study results should be done. On the middle of the lesson time teacher mentioned about the attendance problem and this effected class motivation. It would be better for teacher if he brought this issue for consideration at the end of the lesson. For further times, it would be advisable for the teacher to think about this issue for more effective teaching. Audio-recording showed that teacher tried to use L2 as much as possible; however, he code switched when it was really necessary. It means that teacher was aware of the roles of L1. Overall, researcher believes that teacher's amount of L1 use was enough. However, there are some limitations of this action research. Results shouldn't be generalized since this action research dealt with the limited amount of participants. Data for this action research was collected from two lesson time. Therefore, a longitudinal research should be conducted for better results. On the other hand, a pre-test and post-test can be administered to look at the attitudes of students towards the code-switching during the lesson.

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The Model Research that Compares the Multiple Intelligence Theory Implementations with the Traditional Methods Implemented in the Music Lessons of 4th And 5th Grades in Primary Schools*

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Abstract

The main concern in this study is constituted by the possibility of implementing a music training model which has been developed on the basis of the Multiple Intelligence Theory in the music lessons of the 4th and 5th grades of primary schools. Core study group was formed by 150 fourth and fifth grades students from Ankara Teğmen Kalmaz Primary School and Mamak Primary School and as well as the music teachers working at these schools in 2005-2006 educational period, who were selected by means of a random method. The findings of the research are composed of the pre tests and post tests filled by the students and their teachers as well as the observation sheets used during lessons in which the data about the differences between the traditional method based lessons and the multiple intelligence based lessons have been analyzed by SPSS package program and frequency tables and graphics of the data has been designed, additionally a bilateral relations have been examined by using cross tables. As a result of the study, it has been concluded that the events that activate different intelligence fields are not implemented in the music lessons taught through traditional methods, the creativity of the students has not been improved by different assignments and projects, the teachers do not bring various music-related materials to the classroom and that they do not render the lessons enjoyable. Whereas, it has been understood that in the music lessons based on Multiple Intelligence Theory, the students in the period of concrete process comprehend the abstract concepts of the lesson more effectively by means of plays and different activities, their creativity demonstrates a progress, and that the theory constitute an aid for them in discovering their capabilities. When the model is considered through this aspect, it is clearly obvious that the theory is applicable to the musical training model, the teachers who are to apply the theory should undergo in-service training before the applications, that there might be certain defects during the application of the theory due to physical conditions of the state schools, and that therefore the music rooms and equipment in the state schools should be improved. In the light of these findings, it has been determined that the questionnaire and observation forms produced at the end of the studies could be implemented as an appropriate measure for a research that would be reflected on a general sense and could be practice by schools at various social and economic levels.

Keywords: Multiple Intelligence Theory, Primary School Music Training Lessons, Music Education in Classroom, Musical Plays

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1. Introduction

In traditional methods, everything in teaching-learning process is shaped according to the teacher, most of the time in teaching-learning activities is used by the teacher and communication mostly takes place in one-way. In these methods, group teaching forms the basis whereas the students' individual differences, their interests, abilities, hopes and learning speeds are not considered enough (Alkan, 1977, pp. 140-144). It is also seen that, in this method, students' attention cannot be focused on one point for a long time, memorizing remains at the forefront, with the sequential verbal messages, the notions are confused with each other or cannot be learned completely and only the precise fields such as numerical, verbal and science are measured, but after a while all these factors cause students both to find the teaching activity boring, monotonous and to lose their interest for the lesson.

However, in modern methods, the students take an active role in the learning process. Here, the teachers' role is to guide the students to simplify their learning process, help them to take part actively in the lesson and motivate the students regularly. The reason for this is the adopted view that what the student does and what kinds of products he forms is more important than what the teacher presents (Alkan, 1977; Fidan, 1985). That the person stands in the center of the education activities brings with the fact of individualized teaching process. Individualized teaching is a method of teaching developed to support the individual differences of the students who learn in different ways and with different speed (Tomlinson, 1999).

Individual differences considerably affect learning. Intelligence, one of the individual factors that influences learning, directs the competence in learning process. Applying an education suitable for the students' types of intelligences increases the students' success. In other words, some students have difficulty in learning when there is no teaching activity appealing to them. When such features of students are taken into consideration, education process can be effective and fertile (Bacanlı, 2000, pp. 118-128; Gözütok, 2001, p. 10).

The studies aimed at determining the features of intelligence that is of great importance in individual differences dates back to ancient times. After 1900s, some scientific studies have begun to be made, but it could not have been expressed with a certain definition (Başaran, 1992, p. 82).

The first studies on individual differences and intelligence were made by F. Galton. To Galton, individual differences among people is caused by the differences in sensory abilities. In this case, the sharper the senses of a person are, the smarter he is.

Gardner, in his book called 'Frames of Mind' which was published in 1983, suggested that a person may have seven basic intelligence fields at least. (Later it would be eight with the addition of naturalist intelligence). According to Gardner, intelligence is the competence to form a product that has a value in one or more cultures, to handle with the problems faced in daily life and career in an efficient and fertile way. To Gardner, intelligence is the ability to solve problems in life, form new problems for the solution, find a value in culture and offer a service (Campbell et al., 1999).

To Gardner; Human being has not got just one intelligence. IQ and intelligence tests only measure verbal, logical and mathematical abilities. However, he claims that people have eight different ability fields. Gardner says that the experiences affect the intelligence. Therefore, instead of determining one's intelligence with a test result, he offers to form a profile for one's intelligence fields, considering the culturally valued behaviors in a familiar environment.

While Gardner presents the features related to intelligence theory and scientific proofs, he considerably based his studies on neuro- psychology and brain researches. Every brain has a learning model that is formed by its own thinking model. If the presentation model of the topic which is supposed to be learned suits the model in the brain, a successful learning occurs. Success or failure does not show one's inadequacy of intelligence.

1.1 Multiple Intelligences Theory

The multiple intelligences theory can shortly be summarized as follows: "The key term for multiple intelligences is the word 'multiple'. As the intelligence is versatile, intelligence brought by genetic heredity, can be developed, changed and being smart can be learned to some extent (Selcuk, 2002, p. 12).

The statement "There is not only one or two ways of being smart" constitutes the center of the theory. There are many ways for being smart. Recognizing the students' dominant capacities at different intelligence fields and trying to reach the students through different ways can lead all students to success. "If there are many ways of being smart, there are also many ways of teaching" (Kagan & Kagan, 1998, p. 11).

Gardner, in his book "Frames of Mind", which he published in 1983, enumerates the intelligence fields that are claimed to exist in individuals as: Linguistic Intelligence, Logical-Mathematical Intelligence, Musical Intelligence, Spatial Intelligence, Bodily-Kinesthetic Intelligence, Interpersonal Intelligence, Intrapersonal Intelligence and Naturalist Intelligence.

In the light of this information, in a music education model which is designed in accordance with the theory, it is thought that the students' musical abilities, capacities or their interests and attitudes for music lesson can be developed with this method. Designed lesson plans should be improved by reflecting the suitable activities of intelligence fields.

With the activities, which will support the fields of intelligence such as visual objects, materials, puzzles, games, group discussion, projects, brainstorming exercises and etc., music lessons will be different from the previous lessons implemented with traditional methods.

2. Problem Status

That traditional methods are used at 4th-5th grades of primary school lessons, that teachers are more active in most of the activities, the students' individual differences, interests, abilities, that their learning speed is not considered enough and that their attention cannot be focused on one point for a long time, brings the result of students' unwillingness to the lessons for the students who continue these classes.

In the music lessons of primary schools in Turkey, the issues such as making the students think and become creative in music lesson, adding variations to the music lessons by putting attention on the different intelligence traits, with the multiple intelligence theory based activities that will enable to confirm the fields at which the students are successful are needed.

For this reason, the problem sentence of the research has been determined as "Can a music education model developed on the basis of multiple intelligences theory be implemented on the 4th and 5th grades music education lessons?

3. Goal

In this research, it is aimed to ascertain whether the music lesson teaching model developed on the basis of multiple intelligences theory (in terms of the principles ,methods, plan, program) as well as the methods and techniques used in general music education can effectively be implemented at the 4th-5th grades of music lessons in the primary school.

4. Method

This research carried out for the implementation of multiple intelligences in primary schools' 4th-5th grades music lessons, is a qualitative study. This research is, an applied research in terms of its aims, an action research in terms of qualitative research pattern, a natural environment structured field research in terms of the environment that the research has been implemented. In the research, test model has been used as model. With this research, the data on whether the music education model developed on the basis of multiple intelligences can be implemented on the 4th-5th grades of primary schools, the views of the teachers for the implementation of the music lesson

based on the theory, the difficulties that occur during the lesson and the advantages and disadvantages of the system for the music lessons are collected through observation, document analysis, video recording and questionnaire.

4.1 Data Collection Tools

In this research, some parts of the data related to topic and the solution of the problems and the preparation of implementation materials have been acquired through literature review method and translation of English sources, and for the implementation of the research, questionnaire and observation forms have been used as data collection tools. Procedures have been carried in the following order: First, the teachers who participated in the research were given a two day seminar work related to the implementation of the music lesson based on the multiple intelligences theory; then, two questionnaires were given at the beginning and at the end of the application to determine the views of the teachers about the implementation. Four topics decided by the researcher and music teachers were practiced in eight lesson hours in the classes determined through random method.

Before and after the implementation, a pre- test and a post -test, two questionnaires in total were used to determine the thoughts of students related to the previous music lessons and the lessons implemented based on the theory. All the studies in the classroom were recorded on the observation forms and the students' and the teachers' development steps in implementation process were observed.

4.2 The Analysis of the Data

In pre- test, 72 students at Teğmen Kalmaz Primary School and 57 students at Mamak Primary School participated. In the post-test, 74 students' questionnaires from Teğmen Kalmaz Primary School, and 67 students' questionnaires from Mamak Primary School were evaluated. As the greatest part of the acquired data consist of open-ended questions ,all open-ended questions' thematic coding were done through content analysis and a data entry template was formed in SPSS program under main topics. Frequency tables and graphics were formed and mutual were analyzed using transverse tables. In each of two schools, throughout the four lessons, eight observation forms were filled in for every teacher.

5. Findings and Comments

Findings and comments for the questionnaire given to the students before the implementation of multiple intelligences theory to music lessons

Table 1: Distributions of the opinions for the question “Which of the following activities do you do in music lessons?”

Activity	F	%
We play the flute	128	15,7%
We learn musical notes	122	15,0%
We learn songs	112	13,7%
We learn the topics belonging to music lesson	102	12,5%
We listen to music	74	9,1%
We learn different kinds of music	59	7,2%
We do rhythm training	57	7,0%
We do musical drama	55	6,7%
We play games	52	6,4%
We use percussions	22	2,7%
We produce instruments from waste materials	2	0,2%
Other	30	3,7%
Total	815	100,0%

Table 2: Distributions of the opinions for the question “What activities do you like most in the music lessons?”

The most liked activity	F	%
Playing an instrument and singing	73	56,6%
Listening to an instrument being played	21	16,3%
Solfeggio and note training	12	9,3%
Competition and musical games and activities	9	7,0%
Dance and drama training	3	2,3%
Other	5	3,9%
No answer	6	4,7%
Total	129	100,0%

Table 3: Distributions of the opinions for the question “What are the activities you don’t like to do in music lessons?”

Activities that the students don’t like	f	%
There isn’t any activity that I don’t like	65	50,4%
Solfeggio note and rhythm training	16	12,4%
Playing the flute	12	9,3%
Oral exams	8	6,2%
The teachers’ studying the definite sts and ignoring the others	3	2,3%
Dancing	2	1,6%
The songs that I can’t play	2	1,6%
Leading in the new topic and reading the topics belonging to music lesson	2	1,6%
Writing	2	1,6%
My friends’ playing games in the lesson	1	0,8%
My teachers’ getting angry to me	1	0,8%
Other	3	2,3%
No answer	12	9,3%
Total	129	100,0%

Table 4: Distributions of the opinions for the question “What are your reasons for not liking the activities?”

The reason for not liking the activity	F	%
I can’t do it well	15	11,6%
I find it boring and tasteless	13	10,1%
I don’t feel myself comfortable	4	3,1%
I am afraid of making mistakes	3	2,3%
Other	6	4,7%
There isn’t any activities that I don’t like	65	50,4%
No answer	23	17,8%
Total	129	100,0%

Table 5: Distributions of the opinions for the question “What are your reasons for not attending the lesson?”

The reasons for not attending the lesson	F	%
I don’t like the lesson and I find it boring	10	40,0%
I can’t do it well	8	32,0%
I don’t feel comfortable	5	20,0%
I am afraid of making mistakes	1	4,0%
Other	1	4,0%
Total	25	100,0%

Table 6: Distributions of the opinions for the question “Do you do different homework and group work in music lessons?”

We do different activities in music lessons	F	%
No	73	57,0%
Yes	55	43,0%

Total	128	100,0%
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Table 7: Distributions of the opinions for the question “What are the different activities done in music lessons?”

Different homework and group working activities done in music lessons	f	%
Singing and playing instrument activities	21	38,2%
Dance and musical games	9	16,4%
Rhythm and note training	5	9,1%
Group searching	1	1,8%
Other	3	5,5%
No answer	16	29,1%
Total	55	100,0%

Table 8: Distributions of the opinions for the question “What does music lesson mean to you?”

The meaning of the music lesson for the sts	F	%
It is a lesson that I like and have fun	35	27,1%
Playing instruments and singing	26	20,2%
Information and learning	19	14,7%
It is a lesson that comforts me and makes me feel good	14	10,9%
It is a lesson that I don't like	9	7,0%
It is a lesson that expresses my feelings	6	4,7%
Notes	4	3,1%
Other	4	3,1%
No answer	12	9,3%
Total	129	100,0%

Table 9: Distributions of the opinions for the question “What benefits may the music lesson you take bring to you in the future?”

What benefits may the music lesson they take bring?	f	%
I may make music in the future	33	25,6%
My music ability and taste will develop	28	21,7%
I find it beneficial	16	12,4%
I find it useless	13	10,1%
It will contribute to my personal development	6	4,7%
Other	5	3,9%
No answer	28	21,7%
Total	129	100,0%

When the data presented above (table 1-9) are analyzed, it is found that of the students who have participated in the research, 99,2% play flute, 94,6% learn ‘notes’, 86,8% have learned singing, 79,1% have learned the topics belonging to music lesson. It is also found that of the students who have participated in the research, 56,6% like singing and playing an instrument the most, 16,3% likes listening to an instrument, 9,3% like solfeggio and note training, 7% like competitions and musical games whereas 12,4% do not like solfeggio, note and rhythm training, 9,3% do not like flute training and 6,2% do not like verbal exams. The rates for the reasons why the participant students don't like the activities are such: 11,6% of the students cannot do well in the activities, 10,1% of them find the activities boring and tasteless, 3,1% of them feel uncomfortable, 2,3% of them are afraid of making mistakes. It is also shown in the research that 82,9% of the participant students have attended the music lessons, 17,1% of them haven't attended the lessons. Of the students who state to have actively attended the lesson, 48,6% have played instruments, 28% have done solfeggio note and rhythm training, 17,8% have sung and listened, 8,4% have done dramatization and spontaneous dance training. Of the students who state not to have attended the lesson, 45,5% do not like the lesson and find it boring, 36,4% cannot do well in the lesson, 22,7% feel uncomfortable, 4,5% are afraid of making mistakes, 4,5% have other reasons for not actively attending the lessons. Of the participant student, 57% tells no different homework and group working has been made during the music

lesson, 43% tell the opposite. Of the answers of the group that have done different homework and group working, 38,2% singing and playing an instrument, 16,4% dance and musical games, 9,1% is rhythm and note training, 1,8% is group working. Students express the meaning of the music lesson as: 27.1% of the students who say that music lesson is a lesson that I like and have fun, 20.2% says it is a lesson that I sing and play instruments in, 14,7% says it is a lesson of information and learning, 10,9% says it is a lesson that comforts them and make them feel good, 7% says it is a lesson that they do not like, 4,7% says it is a lesson that expresses their feelings, 3,1% says it is a lesson of musical notes. It is found from the answers to the question "What benefits may the music lesson bring to you?" that of the students who answered the question, 25,6% say "I may make music in the future", 21,7% say "my music ability and taste will develop", 12,4% find the music lesson beneficial, 4,7% say it will contribute on their personal development, 10,1% find it useless, 3,9% find it beneficial in other ways, 21,7% haven't answered the question.

5.1 Findings and comments for the questionnaire given to the students after the implementation of multiple intelligence theory to music lessons

Table 10: Distributions of the opinions for the question "What were the positive factors perceived different from the previous music lesson?"

The positive factors different from the previous lessons	f	%	Total
Activities were very different and entertaining	120	12,7%	141
It was a fun to work with my friends	118	12,5%	141
The lesson were like a game	116	12,3%	141
I have learned by having fun	112	11,9%	141
Preparing Project was fun	99	10,5%	141
I haven't understand how the lesson hour passed	88	9,3%	141
We did different assignments	84	8,9%	141
The questions of the teacher were quite interesting	70	7,4%	141
The teacher designed the class differently	66	7%	141
There hasn't been any difference that I can define as "positive"	26	2,8%	141
I couldn't see any difference	24	2,5%	141
I have no idea	20	2,1%	141
Total	943	100,0%	141

Table 11: Distributions of the opinions for the question "What were the negative factors seen different from the previous music lesson?"

The negative factors different from the previous lessons	f	%
I haven't seen any difference that I can define as "negative"	87	22,5%
My turn hasn't come during the activities	46	11,9%
I have had difficulty in understanding the worksheets	36	9,3%
I have had difficulty in understanding the activities	34	8,8%
I have felt ashamed of performing in the classroom	34	8,8%
I couldn't write different and creative stories	33	8,5%
I haven't taken any responsibility while working with the group	28	7,2%
I have had difficulty in answering the worksheets	27	7%
I took all the responsibility while working with the group	23	5,9%
I have no idea	39	10,1%
Total	387	100,0%

Table 12: Distributions of the opinions for the question "What are your opinions regarding whether or not it was different from the previous music lessons?"

Opinions about whether or not it was different from the previous music lessons	f	%
Yes, I think it was different.	71	50,4%
No, I don't think it was different	18	12,8%
No answer	52	36,9%

Total	141	100,0%
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Table 13: Distributions of the opinions for the question “What were the tasks and responsibilities you have taken?”

The tasks and responsibilities taken	f	%
I have been in charge in group works and projects	25	16,6%
I have taken part in the games related to notes	16	10,6%
I played an instrument	15	9,9%
I haven't taken any responsibility	12	7,9%
Singing	6	4%
I have taken part in dance, poem and drama activities	4	2,6%
I have taken the responsibility of designing a game	3	2%
Other	9	6%
No answer	61	40,4%
Total	151	100,0%

Table 14: Distributions of the opinions for the question “What are your positive opinions about the materials the teacher have brought into the class?”

The positive opinions about the materials that the teacher brought into the class	f	%
Lessons have become more entertaining	67	47,5%
I am learning while playing	15	10,6%
I learn the lesson better	14	9,9%
They were very interesting and creative materials	12	8,5%
I have learned how to learn the music lesson	4	2,8%
Other	9	6,4%
No answer	20	14,2%
Total	141	100,0%

Table 15: Distributions of the opinions for the question “What are your negative opinions about the materials the teacher have brought into the class?”

The negative opinions about the materials that the teacher brought into the class	f	%
I have no negative idea	103	73%
I have found it unnecessary and boring	12	8,5%
I couldn't take my turn due to limited materials	8	5,7%
No answer	13	9,2%
Other	5	3,5%
Total	141	100,0%

Table 16: Distributions of opinions for the question “What have you learned from the individual activities done in the classroom?”

Individual Activities	f	%
My music competence and ability have developed	75	47,8%
I have discovered myself and the things that I can do	18	11,5%
My interest for music has increased	16	10,2%
I have had fun and become happy	12	7,6%
I have gained self-esteem	10	6,4%
I have gained moral courage and ability to speak	9	5,7%
I haven't learned much	6	3,8%
I have gained the ability to work with group	2	1,3%
Other	2	1,3%
No answer	7	4,4%
Total	157	100,0%

Table 17: Distributions of opinions for the question “How do you feel in the course of the lesson?”

The psychology of the students in the course of the lesson	F	%
Happy	115	18,1%
Delighted	107	16,8%
Willing to learn	106	16,7%
Excited	91	14,3%
Curious	82	12,9%
Active in the lesson	70	11%
Other	26	4,1%
Stressed	14	2,2%
Uncomfortable	8	1,3%
Bored	8	1,3%
Remained out of the group	5	0,8%
Unhappy	4	0,6%
Total	636	100,0%

Table 18: Distributions of the opinions for the question “What would you change if you were told to change the music lessons?”

The things that the students' would do in music lessons	f	%
I wouldn't change it	53	37,1%
I would add more games to the lesson	18	12,6%
I would do different activities instead of just teaching notes	6	4,2%
I would use different materials other than the flute	3	2,1%
I would prolong the lesson	2	1,4%
I would give the worksheets that have the lyrics on instead of making the sts write the lyrics	2	1,4%
I would remove writing, verbal exams and homework	2	1,4%
I would remove the music lesson from the program	2	1,4%
Other	5	3,5%
No answer	50	35%
Total	143	100,0%

When the data presented in the tables (Table 10-18) are analyzed, it is found that of the students participated in the research, 85,1% find the activities very different and entertaining, 83,7% find working with friends entertaining, 82,3% see the lesson as a game, 79,4% learn by having fun, 70,2% find the writing projects entertaining, 17% haven't seen any difference, 14,2% have no idea, 61,7% haven't seen any difference which can be labeled as negative, 32,6% say their turn hasn't come during the activity, 25,5% have had difficulty in understanding the worksheets, 24,1% have difficulty in understanding the activities, 24,1% are ashamed of performing in the class, 23,4% can't write different and creative stories, 27,7% have no idea, 50,4% think the lesson is different from the previous music lessons, 12,8% think there is no difference between the two lessons, 36,9% haven't answered the question, 17,7% take charge in projects and group working, 11,3% take charge in the games related to musical notes, 10,6% play instruments, 6,4% take another duties, 8,5% don't take any charge, 47,5% think that the materials that the teacher has brought in the classroom have made the lesson more entertaining, 10,6% learns while playing, 9,9% have learned the lesson better, 8,5% think that the materials are too creative and interesting, 2,8% have learned how to learn the music lesson, 6,4% have other opinions, 14,2% haven't answered the question, 73% haven't got any negative idea about the materials that the teacher has brought in the classroom, 8,5% find it unnecessary and boring, 3,5% have other opinions, 5,7% say their turn hasn't come due to limited materials, 9,2% haven't answered the question, 53,2% think that their music competence has improved, 12,8% have discovered themselves and the things they can do, 11,3% 's interest for music has increased, and it is determined in the implemented lessons based upon the theory, of the students who participated in research, 81,6% feel happy, 75% feel delighted, 75,2% are willing to learn, 64,5% feel excited, 58% are curious and 49,6% have regularly attended the class.

6. Results and Suggestions

6.1 Results Related to the Systems of Music Lesson Teaching

- 1) In the music lessons that are taught through traditional methods, different teaching activities are not included except for the note teaching, flute training, song teaching and topic teaching from music books, and among the activities that the students like most; there are playing an instrument, note learning, singing and some activities such as dance, drama, competition and musical games are not given enough attention.
- 2) In the music lessons that are taught through traditional methods, students are not directed through projects and group work activities, and their creativity is not developed, however the projects and group work activities done in the lessons based on the theory, spares the lesson from monotony and add variety to it.
- 3) Since there is too much crowd in the classes, some students could not take their turn during the activities and most students were negatively affected by this situation. In the lessons based on the multiple intelligences theory, the number of the materials should be increased with the reference to the classroom size.
- 4) In the traditional methods, different materials and activities are not used, but in the theory-based lessons, the materials brought in the classroom enhance the students' creativity and motivation and their learning through the materials.
- 5) Students learn and attend the lesson as if it were a game.
- 6) Abstract notions and principles are taught more efficiently to the students who are at the concrete operational stage through the hands-on materials.

6.2 The Results Related to the Students Comments

- 1) The communication and the interaction that occur during the lessons implemented on the basis of multiple intelligences theory, have positive impacts on students in terms of learning cooperation, filling in the gaps by learning from peer, developing the creativity and enhancing the competition.
- 2) Activities done with this age group who are at concrete operational stage include abstract expressions especially on note and rhythm teaching and they are not taught through hands-on games.
- 3) Although there are clear differences between the game preferences of the male and female students, these differences are not observed in the activities done.
- 4) Students find the multiple intelligence theory-based lessons very different and entertaining, and in group work activities they like both working together and being accepted as an individual in the group.
- 5) In case the teacher is not a good guide to the students during the group work activities in the theory based lessons, some students take charge in the activities whereas the others do not share the responsibilities and work inactively in the group.
- 6) It is seen that in traditional methods students feel unhappy, unable and insecure when they are forced to do the activities they are unwilling to, but in the lessons based on the theory, students consider the lesson as a game, their self-esteem develops, their ability for cooperation increases, their music interest and competence scale up, and they develop moral courage.
- 7) In the multiple intelligence theory-based music lessons, the fact that the students are generally happy, willing to learn, curious during the lesson, excited while coming to the class, and active in the lesson shows that the theory turns the lesson into a more attractive and nice shape compared with the traditional methods.

6.3 The Results Concerning the Harmony with the Music Education Program

- 1) The topics that build up the music teaching program, implemented in the course of the research, need to be reconstructed, and that the repetition of the topics in every year at every stage brings monotony to the teaching of the lesson.
- 2) Music education should be reconstructed with a modern approach that encourages students to search and considers functionality, realism and individual differences.

6.4 Suggestions

On the basis of the data collected in this study, the following suggestions can be made:

- * In relation with the implementation of the theory in music lesson, it is advised that a teacher guide which introduces the theory should be prepared; an in service training program which music teachers will attend and realize the implementations of the theory on music lessons should be designed; and the teachers should come together at the seminars under the control of expert teachers for the implementation of the theory and they should get support related to the implementations they have done and they should share information with the other teachers.
- * It is recommended that the expert teachers who give music education based on multiple intelligence theory should implement the activities and produce projects at certain times on music lessons and taking the consultant role on themselves they should help the teachers who implement the theory, for the probable mistakes and malfunctions,
- * A different music lesson plan format should be upgraded extending the musical and rhythmic fields of the multiple intelligences plans belonging to the music lessons,
- * The school management, family, and the teacher who will implement the lesson and the students should be informed and educated about the topic and common decisions should be taken before the multiple intelligence based music education model implementations.
- * The theory should be reconstructed by being dealt differently in every region according to the conditions and features of the city,
- * Considering the fact that creative thinking needs classrooms that include rich environmental conditions, the schools which will implement the theory, should have a good physical structure, classroom design, technical equipment, material development units, enough instruments, CD, DVD, recorder etc. to be able to implement the theory,
- * The classroom sizes should be at the number of 25 at most for the implementation the theory efficiently (to be able to work on every student in the activities and get a favorable result)
- * A training related to music lesson teaching method based on the multiple intelligence theory should be given to the primary school teachers who studies at primary school teaching department,
- * The activity based music books should be formed in accordance with the topics in an activity based format and at every stage these activities should be differentiated and the course books should be designed under four categories such as teachers' book, students' book, the sample worksheet book, material sets (games, example activities, CDs, DVDs) and also these material samples which will be prepared should be made available to the teachers and they should be developed by material development units,
- * The issue of the music education model based on the theory should be taken as a lesson in the departments of music education of the universities and some studies should be made for developing the content and that expert teachers should be educated on the topic,
- * Some qualitative researches that include the opinions of the teachers and the students should be made about the fact that whether the questionnaire and observation forms that has been formed at the end of the research can be used as an appropriate scale for a research which will be projected to general and about the fact that whether the questionnaire and the observation forms can be implemented in the schools and the cities at different social-economic class.

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Reading Strategies Used by Turkish Teacher Candidates in the Reading Process

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Abstract

This study aimed to reveal which physical strategies (behaviors) Turkish teacher candidates prefer when reading a printed or electronic book/text, what kind of operations they perform related to the text and the reasons for these interventions. Hence, the opinions of 150 teacher candidates in the Turkish Language Teaching program of Istanbul Aydın University Faculty of Education in the spring semester of the 2021-2022 academic year were obtained through a semi-structured form developed by the researcher. Their opinions were analyzed with content analysis. The research was according to the phenomenology pattern. The behaviors of teacher candidates were personal reading strategies. They were classified and graded under various categories. The strategy for teacher candidates who prefer to read printed publications mostly is to make underlines. Then, strategies such as bookmark use and marking were more frequent. In the study, where sex and grade variables did not make a significant difference, some eccentric reading strategies (using a ruler while reading, taking a page/screen photo, using emoji, spraying perfume on the book, etc.) were also present. Finally, the study made various recommendations.

Keywords: Reading, Reading Strategies, Reading Behaviors, Teacher Candidates, Book, Text

1. Introduction

Behavior, which means attitude, action, reaction, and shows positive/negative characteristics, "refers to a cognitive, sensory and psychomotor attitude, occurrence, and situation" (Ari, 2008: 29). The individual develops various behaviors and reactions to people, objects, events, and phenomena. The physical ones of these reactions are observable and external. Cognitive and sensory behaviors are not as observable as physical behaviors.

Behavior is a multifaceted expression and is subject to all kinds of discipline. The discipline of reading is a language skill, and some related behaviors can be called strategies of reading. Some of these behaviors (strategies) take place before reading, while others are during it, and some after (Akyol, 2013; Karatay, 2014). A significant part of the strategies is cognitive strategies related to readiness, efficient reading, and post-reading evaluations. For example, it is a strategy to reveal preliminary information before reading the text. Again, paying attention to the context while reading the text, rereading the incomprehensible sentences/paragraphs, or post-reading interpretations are among the strategies. However, the reader does not only use cognitive strategies in the reading process. He/she also utilizes different strategies, which are physical behaviors. Strategies such as underlining lines,

taking notes on books or notebooks, using bookmarks, and making markings create a wide range of personal reading experiences. These behaviors students use in the reading process are study strategies.

When reading a book, it is a reading behavior for the reader to take notes, fold the page from the edge to remember where he/she left off, or avoid doing this not to harm the book. It is known that some readers who are sensitive to the book do not exhibit any scribbling, marking, or note-taking behavior on the book. Such attitudes and behaviors are also strategic and affect reading understanding.

Behaviors are not far from habits. Habits, in a sense, are automatic behaviors. Some are reflexive, they are done without thinking, whereas some are strategic, and they are applied consciously. In reading, the text/book-related behaviors may be mental, psychological, or physical. If the reader uses efficient strategies, managing the reading process will be efficient, too. According to Karatay, "In the process of comprehending what they read, conscious readers have previously adopted some strategies to cope with the difficulties they will encounter and know in which situations, when, and how to use them" (2009, p. 61).

Regarding the physical behaviors of reading, the pen comes to mind first. Writing, marking, and scribbling are all thanks to him. A cursor is the electronic equivalent of a pen, and the cursor performs actions such as marking, painting, drawing, scribbling, etc.; it helps to take notes with the help of keys. However, sound is also used in writing/printing. Sound can create characters (letters, signs, spaces, etc.). In other words, the sound turns into a writing tool or material.

The physical behaviors preferred in reading are mostly "memory strategies" on remembering in Oxford's (2013) classification of reading strategies. These strategies are within the scope of "strategies that support reading" in the classification of Mokhtari and Richard (2002).

1.1. What is reading?

Today, reading, which corresponds to various meanings, is the reader's reaching new meanings by synthesizing the information in the text with his/her preliminary information (Emiroğlu, 2020, p. 4). The reading action, shaped by factors such as reading, text, and context, is "not just exploring, understanding, and structuring information mentally. Reading is also a voluntary contribution to the meaning of writing" (Güneş, 2016: 2). This contribution qualifies the reading activity.

The meaning of reading has changed and expanded with technology. "Considering that information is not only presented through written and printed texts today, reading can also be defined as a language skill in which mental processes such as attention, perception, remembering, assigning meaning, interpretation, synthesis, evaluation, and analysis occur together on written, visual, and electronic texts" (Aktaş and Bayram, 2018: 1402). Reading is an effort, and it is multi-faceted. "Reading is the activity of extracting meaning from written symbols with the collaboration of cognitive behaviors and psychomotor skills" (Demirel, 1999: 59).

The goal to be achieved by reading is understanding. Badrawi (1992) states that reading is a process, and a product is present at the end of this process (cited in Razi, 2007, p. 17). There is no specific standard for understanding a text or constructing meaning through a text. It affects and differentiates the understanding of characteristics such as background knowledge, intelligence, age, educational status, culture, and interest. A similar situation is present in preferred physical behaviors during reading. The reader may use different physical strategies depending on his/her personality traits in line with the following goals: understanding the material he/she reads, recording it in his/her mind, finding his/her place in the text later, and enjoying the text.

1.2. Reading from paper - reading from the screen

It is faced with reading from paper reading from the screen. The object of reading varies in format. Although readers state in their statements that they prefer printed publications, it is noteworthy that reading from the screen is used more involuntarily. After increasing time spent reading electronic documents, screen-based reading behavior emerged (Liu, 2005). It is possible to say that the readings made by the readers in electronic media or on

the web are a new type of reading, that this turns into a need with the increasing amount of information, and that the person navigates the pages without knowing that he/she is reading. Platforms, tools, and applications (Goodreader, Evernote, Wattpad, Kindle, iBooks, Calibre, Moon+Reader, Adobe, etc.) that facilitate this regarding conscious reading enable one to manage the process more effectively. The gradual development of the tools used (computers, mobile phones, tablets, e-readers, etc.) and their design in a seamless structure and features make reading from the screen enjoyable, functional, and practical.

A significant factor that increases screen reading is the internet. "The widespread use of the Internet since the mid-1990s and advances in screen technology have led to an increase in screen reading behavior globally" (Yaman and Dağtaş, 2013, p. 316). The changes and developments in the internet and digital environment have differentiated the direction, course, and object of reading. Currently, the time spent in the virtual realm is almost halfway through the day. Apart from mobile phone screens, readings are possible on different and large screens (tablets, e-book readers, computers, televisions, billboards, etc.).

Today, the place where literacy is predominantly a digital environment. Children can touch tablets or mobile phones before printed products, understand the instructions on the screens of these devices and make calls, and even learn to read and write in digital environments without requiring a guide.

Screens are everywhere, and readings are done on the screen. Screens appear in markets, streets, schools, homes, and even in almost natural areas. "The printed text, which consists of pictures and writings, almost revived and came to life with texts enriched visually and audibly" (Ministry of National Education (MoNE), 2017: 14). These texts led to the questioning of the nature of reading skills.

Digital reading behaviors are different from printed reading behaviors. This type of skill is more comfortable today. Especially for generations born into technology, screen reading is easier, faster, and more attractive than reading from printed products. Smartphones and computers are essential tools for electronic reading. They have accelerated reading. However, the effects of electronic reading on understanding are still controversial.

Reading from the screen has many advantages and disadvantages. There may be benefits that motivate the reader and facilitate the reader's work, as well as obstacles that cause difficulty for the reader during reading. "While reading from the computer screen, different texts can be displayed and read with hyperlinks or other forms of connection (highlight text, hyperlink, bookmarks, viewers, etc.)" (Maden, 2021: 4). Such an advantage allows the reader to access much data quickly and easily. However, many features of texts, books, and pages in an electronic environment, such as font, size, colors, complexity, surface brightness, etc., may make it difficult to read. Millar and Schrier (2015) pointed out that reading electronically has disadvantages in reading, marking, and taking notes (cited in Keskin and Çetinkaya, 2017). However, reading on paper does not tire the reader as much as digital reading and allows the use of reading strategies (Baştuğ and Keskin, 2012; Güneş, 2010).

Websites direct reading behaviors as much as stationary texts; they enable many different reading behaviors, such as cutting, copying, pasting, taking notes, saving, marking, adding, etc. The interventions to be made on the text or page read in digital media are more than the printed texts. With more fun and colorful touches, the impact of reading, understanding, and remembering is amplified.

Güneş (2016) asserts that readers can remember the information in texts according to their position on the page and states that remembering in printed texts is more efficient than reading from the screen. In their study, Pešut and Živković (2016) concluded that 85 percent of the participants remember the information better when they read from printed materials. Similarly, Farinosi, Lim, and Roll (2016) argue that printed materials help readers remember information from long and complex texts. Baştuğ and Keskin (2012) concluded that students who read printed material understood the text better. Similarly, Özen and Ertem (2013) concluded that building meaning from text is more efficient than reading on paper in their reading studies. Again, Mangen, Walgermo, and Bronnack (2013) concluded that students who read from paper understood the texts better than those who read digitally. According to Baccino, multiple texts increase stress and cause a 30% loss of working power as they present a series of pages to visit and read. In addition, the presentation of multiformat text such as sound, image, image, shape, and video on the screen results in fatigue (Baccino, 2012; Draai-Zerbid, 2012; cited in Güneş, 2016: 12).

In the studies on whether teachers, teacher candidates, or students prefer printed or electronic resources in reading, results in favor of both environments have emerged. In a comprehensive study conducted by MoNE in Turkey in 2017, most teachers read in digital environments. In the study by MoNE (2017), 58.5% of teachers used digital devices for reading. Again, in the study of Duran and Alevli (2014), secondary school students preferred to read from the screen more, and according to the study of Ulusoy and Dedeoğlu (2015), teacher candidates opted for texts in an electronic environment. However, according to the findings obtained from Dağdaş's (2013) research, most teachers generally prefer to read a text from the printed page rather than from the screen.

With increasing readings in the digital environment, the reader's comprehension-based and recall-based behaviors on the text have started to change. This process has been gradual and has taken place over time rather than a sharp transformation. Information is now in the electronic environment rather than printed books, not only in the form of book characters but also with content such as videos, images, texts, symbols, etc. Therefore, the reading behavior of the reader has changed. However, in 2022, when this article was in preparation, behaviors based on understanding and remembering are still dominant through printed books. "Because the strongest feature of physical reading is the strong bond between the printed book and the human, today's human is not yet ready to meet the characteristics of holding it, feeling its smell, tasting the pleasure of watching and briefly connecting with it" (Odabaş, 2018: 7).

Both reading media (printed or electronic) should be used differently according to the purpose. "Considering the purpose of reading, while the paper media maintains its weight in the readings made for the internalization of learning or information, electronic media is preferred in the readings to collect, communicate, and browse practical information" (Stoop, Kreutzer, and Kircz, 2013; cited in Keskin and Çetinkaya, 2017).

1.3. Physical reading strategies (behaviors)

Although readers have similar strategies in the reading process, reading strategies can be as much as the number of readers since reading is a personal action. Whether reading is on printed or electronic material also increases this diversity. Some reading behaviors remain the same even if the format of the material being read changes. While reading printed work, the reader underlines the places he/she likes. The same reader does the same in electronic texts. Human senses are active in both printed and electronic environments. Technology allows it. Almost all senses on printed books take place in the electronic environment today. The page sound of the book is heard, the lines are underlined, notes are taken on the page edges, words/sentences are marked, and almost the smell and texture of the book are reached. Along with physical behaviors, recreation occurs in the text. These changes can rewrite the text. Behaviors such as taking notes, marking, underlining, underlining, etc., can be easier in the electronic environment.

People can mark books/texts as they wish. Although the standards of the markings are considered, a subjective situation is mentioned. Understanding the same book by people at similar levels and even underlining the places they consider crucial can show significant differences. Underlining is the reader's preference for important and insignificant information in a sense. The reader can underline the word/sentence/paragraph that s/he finds important and meaningful in the text and that s/he likes or can use. In learning a foreign language, more unknown words are underlined (Demirbaş, 2018).

In physical reading strategies, notetaking is as dominant as underlining and marking. It is a process known as "taking notes from the reader or listener, selecting necessary information, a word that is favorite, and writing it on the notebook or the receipts" (Göğüş, 1978, p. 284). It is a mental and psychomotor process and shows subjective qualities such as underlining. Notes can be taken in both printed and electronic media. Specific software permits these actions.

Traditional literacy activities, such as reading printed texts and taking notes on paper, have been carried to the screen with the digitalizing world. People who unwittingly read screens started to write, became authors, and share in digital environments without realizing it. "Today, in addition to reading and writing paper-based texts on paper, people read and write from a mobile phone, e-reader, computer screen, and various similar technological tools" (Mazzoleni, 2012). Therefore, the materials taken note diversified.

In the text coding strategy, researchers (L'Allier and Elish-Piper, 2007) state that students can take notes during reading and after reading the text. These can also be sticky papers attached to books or notebooks or even to the corners of the computer screen. "Note-taking on the text edge helps the student to repeat, be ready for new information, and code it" (Arends, 1997, cited in Erdem, 2005: 2). Such a strategy provides permanent learning. The study focused on physical reading strategies. There are many studies in the literature at this point. In the conclusion section, these studies will be mentioned according to their relationship with this research.

2. Method

The phenomenology pattern is one of the qualitative research methods. This study employed this method. Phenomenological research focuses on phenomena that are aware but do not have an in-depth and detailed understanding (Yıldırım & Şimşek, 2011). The opinions of the teacher candidates and why they preferred these opinions were analyzed by a content analysis technique. "Content analysis is a research technique for the objective, systematic and quantitative description of the clear content of communication" (Berelson, 2000, p. 18). With content analysis, it has become possible to determine the density and importance of a specific element by revealing the quantitative frequency of those elements (Tavşancıl and Aslan, 2001).

2.1. Purpose, significance, and research problem of the study

Strategies that people prefer during reading have cognitive, sensory, and psychomotor characteristics. Deciding which lines are underlined and what are noted are cognitive and sensory. Exhibiting these movements are physical and psychomotor reactions. Knowing why and how these strategies are used and recognizing their benefits or harms are metacognitive. The study aimed to reveal which physical strategies Turkish teacher candidates prefer in reading a printed or electronic book/text and the reasons for these preferences. This study is critical in determining and rating these strategies.

In addition to the strategy expression, the term behavior was also present in the study. In addition to known strategies such as underlining lines, taking notes, and marking, different attitudes and habits have emerged depending on various tendencies, the format/type, and perspectives of the material read. In this respect, the terms behavior and strategy were interchangeable in the study.

The question "What are the physical strategies (behaviors) preferred by Turkish teacher candidates while reading a printed or electronic book/text, and why do they prefer them?" listening/monitoring skill area?" To answer this question, the opinions of teacher candidates were under investigation.

2.2. Limitations

The study was limited to the physical strategies (behaviors) preferred during reading and their causes. The expression of physical strategy or behavior aimed to express the reader's attitudes, attitudes, and behaviors, such as drawing lines, taking notes, marking, and so on in the reading process. These strategies are pragmatic. Cognitive or sensory strategies to understand the text (e.g., revealing preliminary information, intertextual interest, researching the author of the work, making comments and evaluations) are out of the scope of the study. In the study, the expression of physical strategy (behavior) was used as an umbrella term to meet the behaviors that can be observed in the reading process and based on intervening, marking, and taking notes on the book/text.

Although the physical strategies used in the reading process (underlining, notetaking, marking, etc.) have been separated and examined from other reading strategies, it is impossible to distinguish them with precise lines. Note-taking, for example, is an action where physical and psychomotor characteristics intersect. However, it is also cognitive and sensory. Because the reader can record the words/sentences/paragraphs, he/she likes or finds critical in a notebook or an electronic word processor program. Here, the action of recording and taking notes is physical and psychomotor. However, processes such as liking and finding crucial information and selecting them from the text show cognitive and sensory characteristics.

In the study, the opinions of Turkish teacher candidates were directly consulted, which is another limitation of the research.

2.3. Study participants

The study group consists of 150 teacher candidates studying undergraduate education in the Turkish Language Teaching program of Istanbul Aydın University Faculty of Education in the spring semester of the 2021-2022 academic year. An easily accessible sample set was selected for the study. Teacher candidates participated in the study voluntarily.

Table 1: Distribution of the Study Group by Sex and Class Level

Demographic Attribute		F	%
Sex	Female	109	73
	Male	41	27
Class	Grade 1	35	23
	Grade 2	39	26
	Grade 3	36	24
	Grade 4	40	27
Total		150	100

109 (73%) participants were female, and 41 (27%) were male. Many women and men representing each grade level participated in the study.

2.4. Data Collection and Analysis

In this study, which aims to determine the physical strategies (behaviors) preferred by Turkish teacher candidates while reading a book/text and their reasons, the form developed to collect the data were delivered to the teacher candidates by the researcher. The researcher guided the teacher candidates during the completion of the form. First, teacher candidates thought about book reading behaviors (strategies) in the literature and printed and electronic books. Then, as stated in the instruction of the form, they focused on only physical reading strategies (behaviors) and wrote down the strategies they used and why they preferred these strategies on the form. They needed to write at least five different opinions, and more if they would like to.

The instructions of the form also included a few examples that teacher candidates could benefit from. The teacher candidates first wrote demographic information such as gender and grade and then filled in the relevant parts of the form meticulously. Some teacher candidates could write more than five behaviors, while a few could only write 3 or 4 behaviors.

The data were transferred to the computer environment, coded, and analyzed by considering sex and class variables and using basic statistical techniques (frequency and percentage). In the study, the sex and class variables did not make a significant difference, and this difference was given in the general evaluation in the conclusion section. In the findings section, the opinions of the teacher candidates are in tables collectively.

Teacher candidates developed 659 opinions in total. There were some data losses (18) during coding and counting. The physical reading strategies written by a few teacher candidates and the explanation of their reason were not consistent. The number of data losses in this way is 5. Other data losses in the study (13) are the opinions of teacher candidates about cognitive strategies for understanding what they read. These behaviors are mental efforts to understand and remember, rather than physical interventions on or from the book. For example, examining the book preface, memorizing the poems in the book/text, researching the author's life, buying books according to their subject, interpreting the book, etc. After removing these data, the remaining opinions are considered valid. Thus, 641 valid opinions were present.

Field experts are used to ensure the validity and reliability of qualitative data (Merriam, 2018). The table in the findings section of the study was presented to 2 field experts, and some adjustments were made in line with their opinions and suggestions. Then, the coding in the table was presented to the same experts again, and it was determined that the percentage of code reliability among the experts showed 90% compliance.

3. Results and Comments

The data were converted into findings and reflected in the table in this section. With the content analysis, the physical strategies preferred by teacher candidates while reading a book/text were in five categories. These are as follows:

1. Drawing line (underline the line, cross out the line, do not cross out the line)
2. Note-taking (on book/text, on paper, in electronic media)
3. Marking (over the book/text, not marking)
4. Touching, changing, placing (folding, using fingers, object/driving)
5. Other (sniffing, sharing)

These categories are divided into sub-dimensions (titles) and shown in the table with the reading purposes and tools

Table 2: Physical reading strategies preferred by teacher candidates during reading, their subdimensions, goals, and tools

Reading Strategy	Sub-Dimension of Strategy	Purpose of the Strategy	Auxiliary object, tool, etc.	F	%
Drawing a line	Underline row	<ul style="list-style-type: none"> Identify the key sentence (s) Identify favorite words/sentences/paragraphs Show unknown words Recognizing foreign words 	Pencil Erasable pen	127	20
	Strike out the row	<ul style="list-style-type: none"> Identify sentences/paragraphs that are inappropriate Clarifying the wrong words Show spelling errors 	Pencil	12	2
	Not drawing line	<ul style="list-style-type: none"> Not to harm the book For others to benefit from In order not to have trapezoid lines 		19	3
Total and percentage				158	25
Note Taking	Above book/text	<ul style="list-style-type: none"> Record favorite words To investigate To post a comment To review Summarize chapters Reflecting emotions Writing incomplete information Writing the meanings of unknown words in margins Writing down where the reader left off while studying as place and date Not to harm the book Writing the names of the characters in the book Learn how to pronounce the names of foreign book characters Concentrate Show errors Knowing the newly learned words with their meanings Writing positive and negative thoughts about the work Writing the end date and time of the book 	Pencil Pilot pen Post-its Strip	45	7

		<ul style="list-style-type: none"> Identify where the author behaves subjectively Making short summaries Remembering the purchase day of the book 			
	On paper	<ul style="list-style-type: none"> Utilize Not to harm the book Reinforcing knowledge Recording what has been understood Writing in the word (dictionary) notebook (unknown words) Writing beautiful words, phrases Writing new meanings of old words Whether to recommend it or not Remembering the characters in the book Expressing and remembering emotions Determine how long it will take to finish 	Notebook (diary, vocabulary notebook, scoring file, general culture notebook, character notebook) Miscellaneous papers	51	8
	To electronic environment	<ul style="list-style-type: none"> Copying important information Utilize 	.docx file Mobile phone	28	4
Total and percentage				124	19
Marking	Above book/text	<ul style="list-style-type: none"> Remember where you are staying (marking the beginning of the page in PDF, marking the first word of the page on the left) Investigate (question mark, arrow, exclamation point) Expressing emotions (emojis) Unknown words (question mark in the printed book; italics in Word) Specify the number of the page you like (scribbling, rounding, coloring) Identify significant, or favorite pages/lines/words (using red color in PDF, highlighting in yellow color, green coloring; marking at the end of the page in the printed book, circling words, placing a bookmark at the beginning and end of the favorite sentence, using an asterisk, quoting favorite sentences; bluing in Word file, darkening, asterisk, question mark, green coloring) Identify historical events (asterisk) To make the book look good (drawing on the first page of the book according to its type) Enjoying the book (painting the descriptions in the book) Clarifying misspelled words (scribbling) Showing who the book belongs to (using a stamp in the printed book, signing the first page) 	Pencil Erasable pen Painting tools Painting/marking tools in the electronic environment Stamp Pen	109	16
	Not marking	<ul style="list-style-type: none"> Not to harm the book Not disrupting reading speed and concentration 		25	4

		● Not to reduce the quality of the book			
Total and percentage				134	20
Touching, placing, changing	Folding	● Remember the last read page (Fold the sheet from the top right, top left, and bottom left; Fold the entire sheet; Fold the page in a triangular shape; Fold the page to the last read line)		93	14
	Using a finger	● Reading more (placing a finger between the pages to be read)		4	1
		● Understand the volume relevance of the book (measure the thickness of the book with thumb and forefinger)			
		● Follow (finger-follow lines from the screen/book)			
	Object use	● Remembering the last read page	Bookmark	120	19
		● Not to harm the book	Magnetic bookmark		
		● Not leaving marks and folds	White paper		
		● Leaving books clean	Paperclip		
		● Stable reading	Bookcase with bookmark		
		● Being able to read easily and comfortably	Pencil		
		● To be permanent	Computer (screen editing mode and tools, electronic tracking tools, files, and folders)		
			Magnifying Glass		
			Ruler		
			Mobile phone		
			Tablet		
			E-book reader		
Total and percentage				217	34
Other	Smell,	● Smelling the book (sniffing)	Perfume	4	1
		● Spreading the smell of books (turning the pages of newly purchased books)			
		● Enjoying the book (spraying perfume on the book)			
	Share	● Sharing (sharing the favorite sentences on 1000kitap.com, sharing the favorite and important sentences on Instagram)	Social Media Web sites Mobile phone	4	1
Total and percentage				8	2

Table 2 shows the physical strategies preferred by the teacher candidates participating in the study while reading a printed or electronic book, the subdimensions, goals, and tools of these strategies, along with their frequency rates and percentages. The ratios of the categories within themselves and among all categories are in the table. The category in which the most reading strategies (217 opinions) are clustered out of a total of 641 valid opinions stated by teacher candidates is Touching, placing, changing. The share of this category in the total is 34%. The second category with the most reading strategies (158 opinions) is "Line drawing". The share of this category overall is 25%. The "Marking" category (134 opinions) ranks 3rd, and the share of this category overall is 20%. The fourth place is the "Note-taking" category. The total share of this category (124 opinions) is 19%. The last place is in the "Other" category (8 opinions), which has a 2% share of the total.

Categories are the top headings that combine reading strategies. Such a method has been preferred for easy understanding of the classification. When the subdimensions of the categories are examined, the most preferred

reading strategy of the teacher candidates is "underlining". This strategy is the most preferred (20%) reading strategy of all categories. After underlining the lines, the most preferred strategy is using objects/tools (19%). Then, marking on the book/text takes place (16%).

The line drawing was present in 3 subdimensions in the study. These are underlining (80%), overlapping (8%), and not underlining the lines (12%). In addition to stating that drawing a line is a strategy that should be for critical points, teacher candidates have revealed that it is a behavior that harms the book and disrupts the aesthetics of the book. The number of teacher candidates (51) who used pencils while underlining the books is remarkably high since those who underline with pencils try to be sensitive to the book.

The note-taking strategy was also present in 3 subdimensions. These are taking notes on the book/text (36%), taking notes on paper (41%), and taking notes on electronic media (23%). In the dimension of taking notes on the book or text, some teacher candidates stated that they could write on the book (margins) for different purposes. However, according to some teacher candidates (20), notes should be on sticky papers (post-its) on the book pages rather than writing on the book or text, and they made readings in this way. The teacher candidates took notes about important information, beautiful words, and evaluations on a paper or notebook but not in the book directly. They presented different and beneficial types of note-taking methods. It is common knowledge that beautiful words and crucial information are written on notebooks/papers, and unknown or foreign words in a book or text are noted in the vocabulary notebook. However, writing the information about the general knowledge in a general knowledge book, determining the score value the book or text (from 1 to 5), recording this score in a scorebook, and writing the various characteristics of the characters in the literary books in a character book are original forms of note-taking. Teacher candidates also took notes in electronic environments other than books and notebooks. They stated that they copied important information from printed or electronic books to Word files and wrote them on their phones to benefit from some crucial and favorite information. The number of teacher candidates (23) who stated that they used pencils while taking notes in the book is high. because of the idea of deleting, correcting, and improving these notes later.

Another strategy preferred by teacher candidates is marking. Marking appears by placing various marks on books or texts. As with printed books, many markings can be made in electronic books. In the study, teacher candidates stated that they made some markings that would make their reading meaningful. The marking strategy had two dimensions. Marking on the book or text (81%) was dominant. The rate of prospective teachers who would not make a mark was 19%. The signs placed on the text/book should consist of shapes, colors, and symbols that will enlighten the reader, encourage him/her to think and research later, and attract his/her attention. In the study, many different symbols, shapes, colors, actions, and signs (question marks, exclamation marks, arrow signs, emojis, scribbling, circling, italicizing, using red-yellow-green-blue-black colors, brackets, quotation marks, stars, darkening, painting, stamping, signing) emerged. Teacher candidates who do not mark do not want to see things that will harm the book, disrupt their reading, and disrupt their focus on the page.

In the study, "touching, placing, changing" was used as the 4th category which contained the following strategies: the reader touching the book, placing something between the book, and trying to change some things in the book. The "folding" behavior under this heading is a method reader uses to remember where he or she last stayed while reading a printed book or text. Different folding tactics were present, such as folding the page from the top right, top left, and bottom left, folding the entire leaf, folding it in a triangular shape, or folding the page to the last reading line. Many teacher candidates (43%) stated that they showed folding behavior to remember where they stayed while reading a book. Four teacher candidates (2%) preferred to use their fingers. One of these teacher candidates (male) stated that he followed the lines in the electronic environment, and the other (female) followed the lines in the printed book with her finger. Both teacher candidates stated that such a habit helped to understand what they read. Many teacher candidates (81) stated under the title of object or tooling (55%) that they used a bookmark to remember which page they left off. This behavior resulted from the thoughts such as not harming the book and leaving the book clean. Some teacher candidates (3) used magnetic bookmarks or book covers to mark the left page by being more sensitive. In this subdimension, a teacher candidate placed paper clips on the page where he/she left off. Some teacher candidates stated that they used various modes of book reading programs (reading mode, screen yellowing, screen darkening, night light mode, page-turning, etc.) on their computer/tablet/mobile phone. Some teacher candidates read more comfortably by reducing the screen brightness

of the computer/tablet/mobile phone/book reader and enlarging the font size of the texts. Curiously, one teacher candidate (male) used a magnifying glass while reading a printed book, and another (female) held a plastic ruler under the lines while reading a printed book. It is a challenging and motivational strategy for a teacher candidate to state that he/she uses white papers to force him/her to read multiplications of 30 pages to read consistently. One student stated that he put a pencil between the books instead of a bookmark and thus focused more on the book. The last category in the study was "Other" because it combines two subheadings that are not directly related to each other. In this category, where a total of 8 teacher candidates expressed their opinions, four teacher candidates showed the behavior of "Smelling" (50%), and four teacher candidates showed the behavior of "Sharing" (50%). The smell of cellulose, printing, and glue is attractive. Three teacher candidates stated that they used their sense of smell. However, it is interesting for a teacher candidate to state that he/she sprays perfume on the books he/she purchases. In this way, the mentioned female teacher candidate could focus on the book much better. Four behaviors were present under the title of "sharing". One of the teacher candidates shared the sentences he/she liked in the books he/she read on a website, and three participants shared them on social media (Instagram) via mobile phone.

4. Conclusion, Discussion, and Recommendations

The results are evaluated in this section, the intersecting, and diverging aspects of the results with the studies in the field are mentioned, and some suggestions are listed.

In the study, sex and class variables did not make a significant difference. The determined reading behaviors are, in general, similar to each other. There is a partnership in basic reading behaviors such as underlining lines, taking notes of crucial and favorite information in books, making markings on the book, and using bookmark. However, some behaviors differ according to sex. For example, one female teacher candidate sprayed perfume on the book, and another used emojis to express her feelings while marking on the book. Again, the behaviors related to smell and touch were mostly among the opinions of female teacher candidates. One male teacher candidate used a magnifying glass while reading a book, and another male teacher candidate recorded his/her notes on his/her mobile phone. In the study, the class variable made almost no difference. Teacher candidates presented similar opinions in all grades.

Although the physical behaviors preferred by teacher candidates while reading books are similar to each other, some of them are different. While there are teacher candidates who do not touch the book while reading to prevent any harm to the book at one end, there are teacher candidates who claim that a book is an object at the other end, and therefore, there will be all kinds of scribbles and markings on it.

In the study, 11 teacher candidates stated that they did not prefer books/texts in PDF format. However, according to 5 teacher candidates, reading from an electronic book was more efficient. Although the study does not focus on the relationship between digital or printed texts and reading attitudes, the predominance of printed books in the opinions of teacher candidates shows that such books are preferred over digital ones. In a study on this subject (Yaman and Dağtaş, 2013), reading in a digital environment affected reading attitude more positively than reading from printed books.

Within the scope of regulations that will increase reading comprehension, to better manage the reading process of teacher candidates, preferring to print books and texts from electronic environments and reading on paper (6 teacher candidates expressed their opinions in this direction) also intersect with the research in the field. Research has revealed that students prefer to work by printing out the data in electronic sources while studying (Keskin and Çetinkaya, 2017; Mizrachi, 2015).

In the study, the strategy of underlining the lines used since ancient times was the most preferred physical reading behavior of teacher candidates. In the study by Beydoğan and Taşdemir (2007), underlining important places was dominant among the students in the faculty of education. The underlining strategy is the strategy teachers make their students use the most (Durkan and Özen, 2018).

Underlining and marking the line is differentiated using printed and electronic books. When the teacher candidates said "I will underline the lines", they meant the printed book. It is also possible to underline the lines in PDF or another electronic book/text format (epub, mobi, text, Word, etc.). This is a preference other than painting (highlighting). However, in the study, prospective teachers either do not know how to underline the lines very well or do not use them in electronic media.

According to Keskin and Çetinkaya's (2017) study, it is possible to say that the strategy of taking notes and marking important places is still a predominantly used application in printed environments. There was a similar result in this study. In the study of Supancic (1995), however, the most used strategy by the students was taking notes. In the study by Çetin (2021) on 143 students (8th-grade students), behaviors such as emphasizing and writing on digital texts were preferred "mostly" and "always". According to another study (Baykan, Naçar, Mazıcıoğlu, 2007), students' high grade point averages were associated with a high level of underlining important information and taking notes while reading.

Several studies revealed that girls are more successful than boys in strategy use level (Güngör, 2005). Some studies had significant results favoring female students in practical and pragmatic strategies such as marking or taking notes (Çöğmen, 2008). However, this study reached no such conclusion. The opinions of teacher candidates are similar. Even the class variable did not make a significant difference in terms of preferred physical behaviors.

Teacher candidates used some reading strategies together. For example, a teacher candidate recorded the lines he underlined in the books in a separate notebook. Both underlining and note-taking strategies are present in this case. Teacher candidates also mentioned digital reading tools while expressing their reading behaviors. Among these, computers and mobile phones were frequently emphasized. In addition, tablets and book readers were also mentioned. However, the most mentioned reading object is the printed book.

It has also become possible to compare printed books and electronic books based on the study. Teacher candidates mainly considered printed books while presenting their opinions. The printed book is a reading object in behaviors such as underlining the lines in the book, taking notes on the book, placing a bookmark between the books, making various markings on the book, and avoiding scratching and marking to avoid damaging the books. However, the book format in the minds of teacher candidates at the point of easy and comfortable reading and marking (enlarging, highlighting, coloring, editing the screen brightness, copying, image acquisition, sharing on social media, etc.) is an electronic book. The cellulosic environment is closer to the human nature than the screen. However, electronic books are also preferred in this information age, due to the convenience of digital environments. In short, printed books are still at the forefront in making long-lasting and enjoyable readings and engaging in different and varied behaviors on the book.

In addition to using bookmarks to remind them where they stay in the book, prospective teachers also use this strategy for book preservation, aesthetic pleasure, and motivational purposes (pleasing to the eye, increasing reading enthusiasm, etc.). Several teacher candidates talked about colorful and eye-catching bookmarks. Some teacher candidates used magnetic bookmarks or book covers with bookmarks.

The study revealed what teacher candidates did on electronic or printed books and what they did not do. What they do not do refers to their conscious preferences. For example, not folding/folding the pages of books. Many teacher candidates do not prefer this because they think it will damage the book and leave a mark. Teacher candidates who do not scribble on the book, underline, overline, take notes, mark, etc., because of concerns such as seeing the book clean, not wanting to harm the book, not looking bad on the pages, not forming traces and folds, and finding it clean if someone else reads it.

In the study, some teacher candidates had practical and original reading methods. A teacher candidate assigned value to colors to better understand the texts he read. He stated that he used yellow color for criticism, red for liking, and black for research purposes on words/sentences/paragraphs while reading texts in an electronic environment. A teacher candidate changed the name of the PDF file he read to the page number on which he stayed so that he did not do a second job, such as saving his place of stay. Interestingly, a teacher candidate expresses his/her emotional state with emojis. At this point, the electronic environment and the printed environment come

together. Emojis are visuals and abbreviations used in electronic correspondence that express emotions. Sometimes mobile forms of these (GIFs) can also be used, but adding emojis to printed books shows how technology affects printed publications. The following behaviors that emerged in the study may also offer a different experience to the readers:

- Underline the first and last words of the favorite sentence Leaving notes between borrowed books that will be useful for readers
- Sticking colored tape where the author of the book/text behaves subjectively
- "How is the book?" writing and answering the question after finishing the book
- Placing motivating pictures and photos between book pages
- Keeping a notebook in which the characteristics of the characters in the book are present
- Keeping a book-scoring notebook
- Drawing a picture on the first page of the book according to its type (novel, story, poem, memory)
- Spraying perfume on the book
- Following the lines in the book with a ruler
- Collecting screenshots from books in a folder

In the study, photography and screenshot-taking behavior, which can be called one of the current methods of taking notes, was used by many teacher candidates.

This study made several suggestions to institutions and individuals (employees, researchers, readers). They are as follows:

- The choice between printed or electronic books during the reading process is subjective. Reading is a personal activity. Publications in both formats are crucial and valuable. Whichever provides a higher yield should be preferred. Likewise, the chosen strategies in the reading process are personal and vary according to the interests and needs of the person. In this respect, it is necessary to examine why the most preferred strategies are preferred rather than the right strategy. In this study, why the strategies used in the reading process are preferred are discussed. In the future, every reading strategy can be focused on in other studies, and at which education level and how they are used can be examined.
- In the study, many different physical reading strategies that readers can benefit from were determined. Such behavior will have positive or negative effects on reading comprehension. If these behaviors motivate and support the person in general to gain diversity, a practical and effective reading will be possible. In the study, it is necessary to know and share these strategies that will give different experiences to the readers.
- Many people use these book backgrounds in interviews, meetings, and video chats from a distance today when printed books turn into a decor that shows being cultured as a background. Moreover, visits to the printed book sections of libraries have decreased, and libraries are mostly for studying, resting, thinking, etc. It would be appropriate to remind with this study that printed books are not nostalgic elements and are still preferred by many people.
- The effects of behavior (strategy) of taking screenshots from both printed and electronic books on learning and remembering should be investigated.
- It can be discussed whether to take notes on the printed or electronic book. If the book can be borrowed, shared, or borrowed from libraries, there should be no marking, notetaking, or scribbling on these books. One can use these strategies if one wants to make more effective readings, and increase recall, deepen on only one's books.
- Teachers who raise generations and teacher candidates who want to do so should be well-trained in using strategies in the reading process. "The high reading motivation and strategic reading behaviors that teacher candidates will develop will affect future teaching practices. Students with teachers with high reading motivation and strategic reading behavior are likely to be more successful readers. For this reason, there should be more studies to improve the reading skills of teacher candidates in teaching programs" (Akbabaoğlu and Duban, 2020: 1723).

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Students' Metaphorical Perceptions Regarding the Concept of School, School Satisfaction Levels and Elements Affecting Satisfaction

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Abstract

In the contemporary education approach, the concepts of satisfaction, teamwork and motivation of school stakeholders, especially the concept of satisfaction are considered important along with approaches such as Human Resources Management, Effective School and Total Quality Management. If it is accepted that the student is at the center of the elements of the school, student satisfaction comes to the fore. The aim of this research is to determine students' perceptions of school through metaphors, to reveal their school satisfaction levels according to some variables and to offer suggestions for increasing satisfaction. The research is mixed method and in the quantitative part, the Students' School Satisfaction Scale (SMSQ) developed by the researcher was applied to the students studying at high schools in Antalya. In the qualitative part, face-to-face interviews were conducted with the students by using a semi-structured interview form prepared by the researcher, and their views on the metaphorical perceptions of the school and the factors affecting their school satisfaction were taken. In the results of the research, it was seen that while the general satisfaction of the students according to the dimensions of the school was moderately satisfied. According to their gender and grade levels, it was determined that there was a significant difference between the groups. The metaphors produced by the students about the school and their reasons are classified and the factors affecting their satisfaction with the school are included.

Keywords: Student, School, Satisfaction, Perception, Metaphor

1. Introduction

Management is defined as the effective and efficient use of human and material resources in line with organizational goals (Aydın, 1991). When the development of management science is examined, it is seen that the concepts of performance, production and organization that make up the Classical period are the priority targets, while in the Neoclassical period, human resources and relations are balanced with the human dimension-organization dimension and started to be considered as a way to increase the performance of the organization. Along with the contemporary management approaches after the neoclassical period, Human Resources Management (HRM) and the human element of the organization have started to be mentioned more in recent years. This has brought employee satisfaction to the forefront, as well as concepts such as job satisfaction, morale and motivation, especially in the organization. Contemporary management approaches in general and Total Quality

Management (TQM) and HRM in particular focus on the satisfaction of the human element in the organization today. The understanding of TQM proposes to evaluate students as a whole, to ensure the participation of teachers and students in school management, and to empower them more.

Giving students points according to their course success is seen as a reflection of the classical management approach. Schools that implement Deming's philosophy of quality have a school culture based on mutual respect and trust, rather than fear and doubt. Schools have an organizational culture where all students, teachers, administrators and support staff work happily (Çetinkaya & Gülmez, 2002). Happiness is the state of being proud of achieving all aspirations completely and continuously; satisfaction is also defined as a person feels when buying a good or service that she/he wants or needs to receive or perform (Shee and Wang, 2008; Cobuild English Dictionary, 1999; Turkish Language Association, 2019). In this case, schools are expected to be environments where students feel happy and will be satisfied with the physical and administrative services that schools offer them. Because schools are institutions that are prepared to realize the educational goals of students. The raw material on which he works is the human coming from the society and going to the society. Mou et al., (2007) define teaching as a service sector and students as customers of the service provided. Therefore, customers in the education and training sector can be counted as students. Student satisfaction is generally accepted as a short-term attitude resulting from the evaluation of the student's educational experience. When actual performance meets or exceeds student expectations, student satisfaction results (Elliott & Healy, 2001).

1.1 Factors affecting school satisfaction

The satisfaction of the student towards the institution where he/she studied is basically a multidimensional phenomenon. This phenomenon can be examined with an approach that includes different dimensions such as the quality of education, physical spaces, application opportunities, social, cultural and sportive opportunities, and the individual characteristics of the student (Uzgören & Uzgören, 2007). Some of the factors affecting student satisfaction are; Academic factors include the quality of education, in-class and out-of-class communication with students, course curriculum, books and other materials to be used in lessons. It is thought that the positive or negative emotions students feel in their schools will affect many factors from their attitudes towards school, their success, their commitment to school, their attendance to school, their communication skills at school and in the classroom, and their general perceptions about the school. Likewise, these factors play a decisive role in the formation of students' perceptions of satisfaction or dissatisfaction with their school.

There are many studies in the literature examining student satisfaction and the factors affecting satisfaction. The findings of some of these studies are as follows; In Barker and Gump (1964) study, it was determined that small schools (100-150 people) offer more opportunities to their students than large schools with more than 2000 people. In these schools, students have more chance to take part in various activities and play leadership roles. The architecture of school buildings, indoor social space, activity areas is effective in the success, morale and behavior of students. The availability of flexible and adaptable spaces, larger rooms and areas for students' art and social activities at the school play an important role in making the school a learning environment (Özbayraktar, 2005; Aksu, Demirel, & Bektaş, 2011; Karakuş, 2010; Kıldan, 2007). Factors such as school staff's interest in students' learning, teacher support, friendly approach of teachers and active and authentic learning seem to be positively related to student satisfaction (Şahin, 2007; Ward, 1995).

In the study named Sop (2020) Education-Teaching Satisfaction, Academic Procrastination Tendency and Academic Achievement Relationship, students' school satisfaction and academic achievement levels were compared and it was determined that satisfaction statistically significantly reduced students' academic procrastination and increased academic success.

In their research, Atay and Yıldırım (2008) used five satisfaction sub-dimensions: the adequacy of the educational environment, school-student relationship, social, cultural and scientific activities, the effectiveness of the Internet

in communication, and the effectiveness of foreign language lessons. As a common result of the research, it reveals the fact that the decrease in the school satisfaction levels of the students paves the way for the emergence of behaviors such as absenteeism and truancy, showing undesirable behaviors in the classroom, and not being willing to do the assigned tasks.

1.2 Metaphors as a means for determining school satisfaction

Metaphors that help in conceptualizing perceptions and revealing concrete pictures about these perceptions help convey information, take legitimate actions, set goals, and structure systems in a coherent way (Goglar, Gross, Hartman, & Cunliffe, 2008). Likewise, it is thought that one of the most effective ways of obtaining information about schools and understanding the school structure is to determine student perceptions, which are considered an important stakeholder. From this point of view, it can be seen that metaphors are powerful tools in understanding schools or revealing the value given to them and the perception felt.

When the literature is examined, there are many metaphor studies related to school. While some of the metaphors in these studies are negative metaphors such as prison, circus, army, factory, zoo; positive metaphors such as family, home, information center, shopping center, orchard were also identified (Inbar, 1996; Mahlios & Maxson, 1998; Saban, 2008; Powell, Farrar & Cohen, 1985; Balcı, 1999; Özdemir, 2012). ; Özdemir and Akkaya, 2013).

Demir (2007) revealed that Turkish and American secondary school students' perceptions of school differ according to culture. While half of the Turkish participants perceived the school as a "home", the other part perceived the school as a "care place", "psychological feeding place", "educational example". While some of the American participants perceived the school as "wild, crowded, complex, boring, painful, orderly environment in which students have to learn to survive", some of them perceived school as "a place of fun, care, interest and learning". In Özdemir and Akkaya's (2013) study, it was determined that students and teachers felt blocked, limited, and thought that they were kept under surveillance and control. It was revealed that the students mostly used the metaphor of prison.

The aim of this research is to reveal high school students' perceptions of school through metaphors and to determine their level of satisfaction with school according to some demographic variables of the students. Another aim of the research is to determine the factors that increase and decrease the students' school satisfaction and to make scientific suggestions for increasing satisfaction. In the light of these aims, answers to the following questions were sought:

- 1a) What is the school satisfaction level of high school students according to the types of high schools they study?
- 1b) What is the school satisfaction level of high school students according to their grade level and is there a significant difference between these levels?
- 1c) What is the school satisfaction level of high school students according to the gender of the students and is there a significant difference between these levels?
- 2) What are the metaphors produced by high school students about school and their reasons for these metaphors?
- 3) According to the opinions of high school students, what are the factors that increase or decrease school satisfaction?

2. Method

In this section, explanations about the research model, study group, data collection technique, and data analysis are given.

2.1 The Research Model

In the study, a mixed pattern method was followed by using quantitative and qualitative research methods together. Mixed methods research is defined as the researcher combining qualitative and quantitative methods, approaches and concepts within a study or successive studies (Creswell, 2003; Tashakkori & Teddlie, 1998; Johnson & Onwuegbuzie, 2004). The quantitative part of the research is the survey model; the qualitative part was prepared in a phenomenological pattern.

2.2 Study Group

The study group of the quantitative part of the study consists of 36 official Anatolian high schools, 27 vocational high schools, 3 science high schools and 9 Imam Hatip high schools in Konyaalti, Kepez, Muratpasa, Aksu and Dosemealti districts in Antalya province in the 2020-2021 academic year. The schools included in the study were selected in accordance with the easily accessible disproportionate cluster sampling. In the selection of the students, the random method was used by taking a certain number of (5 each) students from each grade level (9-10-11-12) selected by stratified sampling method from each high school type. Thus, a total of 920 students, 20 from each high school sampled, were sent a questionnaire, but a total of 725 questionnaires were taken into consideration, some of which were excluded because they contained missing data or were in extreme values, and it was determined that the sample represented the population at the .05 error level (Balci, 2009; Krejcie & Morgan, 1970).

In the qualitative part of the research, in the selection of the schools to be interviewed, a total of 20 students from 5 Anatolian high schools in regions with different socioeconomic structures as much as possible and a certain number of each grade level of these high schools were selected according to the maximum diversity sampling method from purposive sampling methods. It was decided by the researcher to conduct the qualitative part of the study based on interviews in this type of high school, both in terms of Anatolian high schools being the type of high school with the lowest satisfaction levels as a result of the survey application, and being the most common among the high school types (MEB, 2020) participating in the study.

Table 1: Demographic Characteristics of the Students Participating in the Study

Variable		N (725)	%
Gender	Female	387	53
	Male	338	47
Grade Level	9th	205	29
	10th	231	31
	11th	182	26
	12th	107	14
School (High School)Type	Imam Hatip	109	15
	Vocational	168	23
	Anatolian	306	42
	Science	142	20
School Size (Population)	less than 500	173	24
	more than 500	552	76

When the demographic characteristics of the participants are examined, it is understood that 387 of the 725 students studying in all high school types are female and 338 are male. When high school types are evaluated, it is seen that 109 of them are in imam hatip high schools, 168 in vocational high schools, 306 in Anatolian high schools and 142 students in science high schools; when examined in terms of grade levels, the 9th grade level is 205; 231 at the 10th grade level; It is seen that 182 students at the 11th grade level and 107 students at the 12th grade level

participated. In terms of the size of the school, it was determined that there were 173 students in high schools with less than 500 students and 552 students in high schools with more than 500 students.

Table 2: Demographic Characteristics of Anatolian High School Students Who Participated in the Qualitative Part of the Study

Variable		N (20)	%
Gender	Female	11	51
	Male	9	49
Grade Level	9th	5	25
	10th	5	25
	11th	5	25
	12th	5	25

When the demographic characteristics of the participants who were interviewed in the qualitative part of the research are examined, it is understood that 11 of the 20 students studying in Anatolian high school are female and 9 are male. In terms of grade levels, it is seen that 5 students from each level (9-10-11 and 12th grade) participated in equal numbers.

2.3 Data Collection and Analysis

In the quantitative part of this thesis, the “Student Satisfaction with School Scale” (SMS) developed by the researcher was applied to measure the satisfaction levels of the students studying at official high schools in Antalya. In the qualitative part, a semi-structured interview form prepared by the researcher and consisting of open-ended questions was used.

Quantitative part of the study;

In this study, the Students' School Satisfaction Scale (SMS) developed by the researcher regarding the main problem and consisting of six dimensions (*Administrative Structure and Functioning of the School, Relevance of Course Content, Program and Curriculum, Physical Structure of the School, Adequacy of Gardens and Departments, The Quality of Education at School and Its Contribution to Student Development, Services and Opportunities Provided by the School to the Students, Student-Teacher Relations and Communication*) was delivered to 800 students studying at public high schools in five central districts of Antalya in the 2020-2021 academic year. Kaiser-Meyer-Olkin (KMO) and Bartlett tests were conducted to test the analysis suitability on the data set of 725 students, which was obtained after the detection of missing data that would not be included in the analysis. As a result of the KMO and Bartlett Tests (KMO = .96, Bartlett's Test of Sphericity= 7148,385 df=902, $p = .000$), it was determined that the data were suitable for factor analysis ($KMO \geq 0.70$ and $p < .05$) (Pallant, 2016; Hutcheson and Sofroniou, 1999; Seçer, 2015). SPSS package program was used to analyze the data obtained from the students. While the t-test was used to compare the arithmetic mean, frequency, item analysis, and the mean of two independent groups, One-Way Analysis of Variance (ANOVA) were used to compare the mean of more than two groups, and the LSD test, one of the Post-Hoc tests, was used to determine between which groups the difference was. The level of significance in statistical procedures was accepted as .05.

Qualitative part of the study;

Face-to-face interviews were conducted with 20 students from all grade levels from Anatolian high schools, using a semi-structured interview form consisting of open-ended questions prepared by the researcher in order to make an in-depth analysis of the metaphors they produced about the school and the factors affecting school satisfaction

in line with the school satisfaction levels obtained from the students as a result of the survey. Content analysis was used in the analysis of the data obtained from the interview recordings. In addition, codes such as FS11-7, MS10-2 were used for the participants in order to hide the personal identities of the participants during the data analysis process. This research was carried out on a voluntary basis by personally visiting the schools determined by the researcher. At the same time, the research process is written clearly from start to finish, making it possible to re-apply it by other researchers. The reliability of the research was calculated by using Miles and Huberman's [Reliability: Consensus / (Consensus + Disagreement)] formula (Cited by Saban, 2008). In qualitative research, the desired reliability is provided when the agreement between the evaluation of the experts and the researcher is 90% or more (Saban, 2008). According to Miles and Huberman's formula, the reliability of the study was calculated as 0.94.

3. Findings

1a. Findings Related to the Satisfaction Levels of the Students according to the High School Types

The satisfaction perceptions of the students participating in the research in terms of high school types (Imam Hatip-Vocational-Anatolian-Science High School) are given and presented in Table 3.

Table 3: Distribution of Students' Satisfaction Levels by High School Types and ANOVA Test Results

Dimensions	School Type	N	\bar{X}	S	F	p	Difference (LSD)
Administrative Structure and Functioning of the School	<i>ImamHatip (a)</i>	109	3.56	.93	1.23	.296	
	<i>Vocational (b)</i>	168	3.52	.95			
	<i>Anatolian (c)</i>	306	3.52	.99			
	<i>Science (d)</i>	142	3.70	.90			
	<i>total</i>	725	3.56	.96			
Relevance of Course Content, Program and Curriculum	<i>ImamHatip (a)</i>	109	3.32	.97	3.72	.011*	a-b
	<i>Vocational (b)</i>	168	3.34	.94			a-c
	<i>Anatolian (c)</i>	306	3.10	.95			a-d
	<i>Science (d)</i>	142	3.07	.93			b-c
	<i>total</i>	725	3.18	.95			b-d
Physical Structure of the School, Adequacy of Gardens and Departments	<i>ImamHatip (a)</i>	109	3.65	.77	14.38	.000*	a-b
	<i>Vocational (b)</i>	168	3.25	.89			a-c
	<i>Anatolian (c)</i>	306	3.31	.86			b-d
	<i>Science (d)</i>	142	3.74	.67			c-d
	<i>total</i>	725	3.43	.84			
The Quality of Education at School and Its Contribution to Student Development	<i>ImamHatip (a)</i>	109	3.70	.95	2.89	.035*	a-c
	<i>Vocational (b)</i>	168	3.54	.98			
	<i>Anatolian (c)</i>	306	3.40	1.00			
	<i>Science (d)</i>	142	3.49	.88			
	<i>total</i>	725	3.49	.97			
Services and Opportunities Provided by the School to the Students	<i>ImamHatip (a)</i>	109	3.70	.80	5.96	.001*	b-d
	<i>Vocational (b)</i>	168	3.52	.89			c-d
	<i>Anatolian (c)</i>	306	3.61	.84			
	<i>Science (d)</i>	142	3.89	.61			
	<i>total</i>	725	3.66	.82			
Student-Teacher Relations and Communication	<i>ImamHatip (a)</i>	109	3.83	1.01	1.19	.310	
	<i>Vocational (b)</i>	168	3.65	.99			
	<i>Anatolian (c)</i>	306	3.65	.90			
	<i>Science (d)</i>	142	3.67	.85			
	<i>total</i>	725	3.68	.93			

Total	ImamHatip (a)	109	3.49	.75	2.05	.105
(General Satisfaction)	Vocational (b)	168	3.38	.80		
	Anatolian (c)	306	3.32	.78		
	Science (d)	142	3.47	.65		
	total	725	3.39	.76		

*p<0.5

When the results of the ANOVA Test conducted regarding the satisfaction perceptions of the students according to the high school types they study are examined, it is seen that there is a significant difference between the students' satisfaction with the school and the high school types. LSD, one of the Post-Hoc tests, was used to determine which groups were different according to high school types, and the arithmetic averages of these groups were examined. When we look at all the dimensions of the school in the table, it is understood that the school satisfaction level of the students in imam hatip high schools is higher than the students in other high school types. When examined in terms of dimensions, the satisfaction level of science high school students in the Administrative Structure and Functioning of the School is $\bar{x}=3.70$; it has been determined that the satisfaction levels of Anatolian high school and vocational high school students have the lowest satisfaction as $\bar{x}=3.52$. While the satisfaction perceptions of the vocational high school students, who are higher than the other high school types in terms of Relevance of Course Content, Program and Curriculum, are $\bar{x}=3.34$, it is seen that the average of science high school students has the lowest perception of satisfaction as $\bar{x}=3.07$.

It was found that the satisfaction perceptions of science high school students ($\bar{x}=3.74/3.89$) in the dimensions of the Physical Structure of the School, the Adequacy of Gardens and Departments, and the Opportunities and Services Provided by the School to the Students ($\bar{x}=3.74/3.89$) have the highest degree among high school types; it is observed that vocational high school students' satisfaction with this dimension is at the lowest level ($\bar{x}=3.25/3.52$).

In dimensions of Quality of Education and Its Contribution to Student Development and Student-Teacher Relationship and Communication at School, imam hatip high school has the highest level of school satisfaction ($\bar{x}=3.70/3.83$); the type with the lowest satisfaction was found to be vocational high school students ($\bar{x}=3.52/3.32$).

1b. Findings Regarding Grade Levels of Satisfaction of Students in High Schools

The satisfaction perceptions of the high school students participating in the research in terms of grade levels (9th-10th-11th-12th grades) are included and are presented in Table 4.

Table 4: Distribution of Students' Satisfaction Levels by Class Levels and ANOVA Test Results

Dimensions	Grade Level	N	\bar{X}	S	F	p	Difference (LSD)
Administrative Structure and Functioning of the School	9th (a)	205	3.78	.85	10,25	.000*	a-c
	10th (b)	231	3.61	.95			a-d
	11thf(c)	182	3.45	.96			b-d
	12th(d)	107	3.19	1.03			c-d
	total	725	3.56	.96			
Relevance of Course Content, Program and Curriculum	9th (a)	205	3.28	.93	2,78	.040*	a-d
	10th (b)	231	3.19	.96			b-d
	11thf(c)	182	3.20	.97			c-a
	12th(d)	107	2.96	.93			c-d
	total	725	3.18	.95			
Physical Structure of the School, Adequacy of Gardens and Departments	9th (a)	205	3.56	.82	8.94	.000*	a-c
	10th (b)	231	3.54	.80			a-d
	11thf(c)	182	3.36	.87			b-c
	12th(d)	107	3.10	.84			b-d

	<i>total</i>	725	3.43	.84			c-d
The Quality of Education at School and Its Contribution to Student Development	<i>9th (a)</i>	205	3.63	.91	5.57	.001*	a-c
	<i>10th (b)</i>	231	3.57	.93			a-d
	<i>11thf(c)</i>	182	3.42	1.00			b-a
	<i>12th(d)</i>	107	3.20	1.03			b-d
	<i>total</i>	725	3.49	.97			
Services and Opportunities Provided by the School to the Students	<i>9th (a)</i>	205	3.89	.73	19.25	.000*	a-c
	<i>10th (b)</i>	231	3.71	.78			a-d
	<i>11thf(c)</i>	182	3.61	.80			b-a
	<i>12th(d)</i>	107	3.19	.89			b-d
	<i>total</i>	725	3.66	.82			c-d
Student-Teacher Relations and Communication	<i>9th (a)</i>	205	3.68	.94	1.93	.123	
	<i>10th (b)</i>	231	3.77	.90			
	<i>11thf(c)</i>	182	3.67	.94			
	<i>12th(d)</i>	107	3.50	.99			
	<i>total</i>	725	3.68	.93			
Total (General Satisfaction)	<i>9th (a)</i>	205	3.54	.71	9.16	.000*	a-c
	<i>10th (b)</i>	231	3.44	.74			a-d
	<i>11thf(c)</i>	182	3.34	.77			b-c
	<i>12th(d)</i>	107	3.09	.78			b-d
	<i>total</i>	725	3.39	.76			

*p<0.5

When the results of the ANOVA Test conducted regarding the satisfaction perceptions of the students in Table 4 according to the grade level they are studying are examined, it is seen that there is a significant difference between the grade levels of the students' satisfaction with the school. The LSD test, one of the Post-Hoc tests, was used to find the source of the difference as a result of the analysis of variance. Accordingly, since $P = .00$ ($p < .05$), there is a significant difference at the level of .05 between the satisfaction levels of the students studying in high schools according to their grade levels. When we look at all the dimensions of the school, it is understood that the satisfaction levels of the students studying in the 9th grade are higher than the students at other grade levels. In the Administrative Structure and Functioning of the School dimension, the satisfaction level of the 9th grade students was $\bar{x} = 3.78$, while the average of the 12th grade students in the same dimension was $\bar{x} = 3.19$, and it was determined that the satisfaction decreased as the grade levels increased.

In dimension of the relevance of the course content, program and curriculum, the satisfaction perception of the 9th grade students is $\bar{x} = 3.28$, while the average of the 12th grade students is $\bar{x} = 2.96$. Again, in terms of the physical structure of the school, the adequacy of the garden and its departments, the satisfaction level of the 9th grade students is $\bar{x} = 3.56$, while the level of satisfaction decreases to the $\bar{x} = 3.36 / \bar{x} = 3.10$ band at the 11th and 12th grades as the grade levels increase. And finally, in parallel with the other results in the dimension of the Services and Opportunities Provided by the School to the Students, it is seen that the satisfaction levels of the 9th grade students are relatively high. Accordingly, while the satisfaction level of the 9th grade students was $\bar{x} = 3.89$, it was determined that the satisfaction level of the 12th grade students decreased to $\bar{x} = 3.19$; no significant difference was found in students' perceptions of school satisfaction according to their grade levels in the dimension of Student-Teacher Relationship and Communication.

1c. Findings Related to Satisfaction Levels of High School Students by Gender

In this section, the satisfaction levels of the high school students participating in the research in terms of gender are included and are presented in Table 5:

Table 5: Distribution of Students' Satisfaction Levels by Gender and t-Test Results

Dimensions	Gender	N	\bar{X}	S	sd	t	p
Administrative Structure and Functioning of the School	F	387	3.51	.98	723	1.52	.128
	M	338	3.61	.93			
Relevance of Course Content, Program and Curriculum	F	387	3.08	.91	723	3.15	.002*
	M	338	3.30	.99			
Physical Structure of the School, Adequacy of Gardens and Departments	F	387	3.43	.85	723	.070	.945
	M	338	3.44	.84			
The Quality of Education at School and Its Contribution to Student Development	F	387	3.43	.98	723	1.96	.050*
	M	338	3.57	.95			
Services and Opportunities Provided by the School to the Students	F	387	3.62	.83	723	1.17	.240
	M	338	3.70	.80			
Student-Teacher Relations and Communication	F	387	3.63	.95	723	1.61	.108
	M	338	3.74	.92			
Total	F	387	3.33	.75	723	2.12	.034*
	M	338	3.45	.76			

*p<0.5

The distribution of the satisfaction levels of the students studying in high schools according to the gender of the students and the results of the “t” test are seen. Accordingly, it is understood that 387 of the 725 students participating in the research are female students and 338 are male students. When the students are examined in general, the arithmetic mean of the satisfaction levels of the female students is $\bar{x}=3.33$. The arithmetic mean of male students' satisfaction levels is $\bar{x}=3.45$. In the statistical analysis, the “t” value is 2.12. The “p” value regarding the satisfaction levels of high school students is $p=.03$ and $p<.05$. For this reason, it is seen that there is a significant difference between the students according to the gender variable regarding the satisfaction levels. It is understood when we look at the arithmetic averages of which group of students' satisfaction level is low or high according to the gender variable. Accordingly, it is seen that male students' satisfaction levels from school in all dimensions are higher than female students. While the lowest level of satisfaction with the school, which students (female-male) meet in common, is in the dimension of Adequacy of Course Content, Program and Curriculum; ($\bar{x}=3.08/3.30$) and it was determined that the highest satisfaction perceptions were in the dimension of Student-Teacher Relationship and Communication at School ($\bar{x}= 3.63/3.74$).

2. Opinions of High School Students on Metaphors They Produced About School and Their Reasons

In this section, the opinions of the high school students participating in the research on the metaphors they produced about the school and their reasons are given and presented in Table 6.

Table 6: Metaphors and Reasons of High School Students Regarding School

	Metaphors	Reasons	Participations	f
METAPHORS (POSITIVE)		Challenging; but the result is satisfactory.		
	Tree		<i>FS11-2, FS12-12</i>	2
		The tree is rooted and useful, but yields results depending on your approach to it.		
	Football field	For me, it means the place where I miss the classes and play football all day long.	<i>MS11-4</i>	1
	A disciplined place that prepares you for the future.	Because it makes us professionals.	<i>MS11-5</i>	1
	Fun vehicle	I see it as a means to reach my goals.	<i>FS12-5</i>	1
	Second home	It's not boarding, but we spend more time here than at home.	<i>MS10-6</i>	1
METAPHORS (NEGATIVE)	Home	School is a very special place, in my opinion.	<i>FS10-7</i>	1
	Spinach	I have to eat even though I don't like it.	<i>FS9-1</i>	1
	Jelly beans	It makes you nauseous when you eat too much.	<i>MS10-1</i>	1
	Semi-open prison	Entry and exit with permission. The school manager is like the prison warden.	<i>MS12-2</i>	1
	The Military	It's not like a prison, but a purposeful community with lots of rules and no fun.	<i>FS12-3</i>	1
	Prison, Educational Prison, Children's Prison	A place that acts at the request of the administrator and can be entered and exited with permission.	<i>FS10-4, MS9-3, FS9-9, FS12-8, MS11-7</i>	5
		Same with their sentries, their walls, and the fact that we're being questioned.		
		Our communication with the outside is cut off; We just have to talk to the people at school.		
		The same in terms of operation; The only difference is that we are training here.		

Metaphors	Reasons	Participations	f
	We stay with our peers for a long time without leaving school.		
Farm Sheep Flock (Students)	The best fed animals on farms are taken to slaughter; Our most successful ones also benefit from school, but it is wasted.	FS11-6	1
Labyrinth	It is a very complex and difficult to understand structure in terms of the courses and the people in it.	FS9-11	1
Office	Employees are stuck there all day.	MS9-8	1
Closed Box	Even if we want to go out, we cannot go out without permission.	MS10-9	1

When the metaphors produced by high school students about school and their reasons are examined, it is seen that metaphors are divided into metaphors with positive meaning and metaphors with negative meaning. When school metaphors were examined, it was determined that metaphors with negative meanings were more than positive ones. Two of the students (FS11-2, FS12-12) made a tree analogy to the school; 5 students (FS10-4, MS9-3, FS9-9, FS12-8, MS11-7) used metaphors such as Prison, Education Prison and Children's Prison. Again in the table, the school of one of the participating students (KFS11-6) is on the farm; the students at the school to the flock of sheep; another participant student (FS9-11) used the metaphor of the labyrinth to compare the school to a complex place.

3. High School Students' Views on the Factors Affecting School Satisfaction

The opinions of the high school students who participated in the research on the factors that increase or decrease their school satisfaction are given in Table 7 and Table 8.

Table 7: Factors Increasing School Satisfaction According to High School Students' Views

Factors Increasing School Satisfaction	Participations	f
1. My Friends	MS11-7, FS9-9, FS12-8, FS12-10, MS10-6, MS12-4, MS9-3, MS11-5, MS12-2, MS10-1, FS12-5, FS11-6, FS12-3, MS8-9, MS10-9	15
2. My Favorite Teachers	FS10-7, FS12-8, FS9-11, MS10-6, MS11-4, MS10-1, FS11-6, FS12-5, FS12-3, MS8-9, MS11-7, MS10-9	12
3. My Favorite Lessons	MS12-2, MS12-4, FS9-11, FS11-6, MS10-9	5

When the factors that increase school satisfaction according to the opinions of high school students are examined, it has been determined that the students' opinions mostly focus on three elements and these elements are *My Friends*, *My Favorite Teachers*, *My Favorite Lessons*. According to the table, 15 students gave the most opinion

on the factors that increase their school satisfaction as *My Friends*, followed by 12 students with the answer *My Favorite Teachers* and 5 students in the third place with the answer *My Favorite Lessons*.

Table 8: Factors Reducing School Satisfaction According to High School Students' Opinions

Factors Reducing School Satisfaction	Participations	f
1. Curriculum	FS9-1, FS11-2, FS11-6, FS10-4, MS10-1, FS11-6, FS12-3, FS11-2	8
2. Anxiety for the future	MS11-7, FS9-9, FS12-8, FS9-1, MS8-9, MS10-9, MS11-5	7
3. Weekly course schedule	FS10-7, MS10-6, FS9-1, MS12-2, MS10-1, FS12-3	6

When the factors that reduce school satisfaction according to the opinions of high school students are examined in the table, it has been determined that the students' opinions focus on three elements in particular, and these elements are *Curriculum*, *Anxiety for the future* and *Weekly course schedule*. According to the table, it is seen that 8 students gave the highest number of opinions as *Curriculum* regarding the factors that decrease school satisfaction, 7 students who followed it gave the answer of *Anxiety for the future* and 6 students gave the answer of *Weekly course schedule*.

4. Results and Recommendations

The first sub-problem of the study was prepared as *What is the satisfaction of high school students with regard to their school types, grade level and gender, and is there a significant difference between these levels?* When examined in terms of gender variable, it was determined that there was a significant difference between female students and male students studying at high schools in terms of school satisfaction perception levels, and accordingly, it was seen that female students' school satisfaction levels were lower than male students. When the literature was examined, it was found that the results of the research conducted in which the school satisfaction of female students were higher than that of males (Özdemir, 2012).

When the school satisfaction perception levels of the students were examined according to the high school types they studied, it was seen that there was a significant difference between the high school types. Accordingly, the high school type with a relatively low general satisfaction level (I am moderately satisfied) belongs to the students in Anatolian high schools; It has been determined that the students who have a relatively high (I am satisfied) perception of satisfaction are the students of Imam Hatip High Schools. The result of this research is compatible with the findings of Yılmaz's (2007) study on the quality of school life. When examined in terms of dimensions, it was determined that the difference between the satisfaction perception levels of Anatolian high school students and imam hatip high School students was the highest in the dimensions of the Physical Structure of the School, the Adequacy of the Gardens and Departments, and the Relevance of the Course Content, Program and Curriculum. Some programs and models such as the Educational Guidance and Support Program (EGSP), Teacher Development Program (TDP) and projects such as TUBITAK and Erasmus are carried out in Imam Hatip high schools through the Quality Monitoring System supported by the Ministry of National Education General Directorate of Religious Education. It is thought that it contributes to the physical structure of the students and that the opportunity to improve their physical structure increases the school satisfaction of the students.

According to the study of Kayıkçı, Altun and Karakoç (2019), one of the most important reasons why the physical structures of high schools create dissatisfaction for students is that school areas are not allocated by estimating the number of students in the coming years, taking into account population density due to unplanned schooling, and

often the pre-planned school gardens are additional buildings. This aforementioned research shows parallelism with the result of Anatolian high school students' satisfaction perceptions. Additional buildings to the school garden cause congestion in the pre-planned service areas of the school, as well as narrowing the school gardens and reducing the playgrounds per student, which causes the dissatisfaction of the students. The student's opinion on this situation explains this situation: *"From the outside, the school looks like a boutique hotel; later, another floor was built and the area was tried to be expanded, but the garden area was narrowed; Despite this, our class size is still crowded."* (FS12-2) While one of the most important reasons why the students of Anatolian high schools have a lower level of satisfaction in terms of *Adequacy of Course Content, Program and Curriculum* is that the program range of these high schools is very general and includes different courses in the curriculum; it is thought that the programs of the students in Imam Hatip high schools are more likely to coincide with a certain field. The opinions of the students regarding this situation support the situation: *"I think that some of the course topics do not contribute to me. We learn in detail many content that I believe will not be of use to me in the future. Learning all the courses for a long time creates problems for our academic life and career choice in the future."* (FS9-1) According to the results of the study, it was observed that the school satisfaction perceptions of high school students tended to decrease as their grade levels increased. In other words, it has been determined that the students' level of satisfaction with school in the 9th grade is higher than the other grade levels, while the lowest level of satisfaction belongs to the students in the 12th grade. These findings support the studies of Eccles, Midgley, and Adler (1984) and Özdemir (2012). In the aforementioned studies, it has been determined that student motivation towards school tends to decrease as the grade level rises. Regarding this sub-problem, it is thought that with the increase in grade levels, students' higher education entrance exam triggers anxiety due to the approaching time and this causes a decrease in school satisfaction. The statement of a student (MS12-4) *"If you had had this interview with me two years ago, I would have been much more comfortable and would have answered positively, but right now I have a lot of exam anxiety, the exam is approaching"* explains that exam anxiety plays an important role in satisfaction. In our exam-oriented education system, as the exam date approaches, teachers, school administrators and even parents are affected by it, and this naturally affects the student negatively. It can be said that the school satisfaction of the student who feels himself under pressure decreases indirectly.

When the metaphors produced by high school students about school, which is the second sub-problem of the research, and the reasons for these metaphors are examined, it has been revealed that the metaphors and justifications produced by Anatolian high school students for school are divided into positive and negative metaphors. As a result of the study, it can be stated that the metaphors with positive or negative meanings produced by the students about the school are in parallel with the results of many school metaphor studies in the literature (Saban, 2008; Balcı & Mazlum, 2018; Bülbül & Gökçe-Toker, 2014; Özdemir & Akkaya, 2013). One student (MS10-1) had a feeling of disgust towards the school on the grounds of the *"jelly beans"* metaphor and expressing it, and another student (FS9-1) said the end of Friday, *"I come to school on Fridays motivated; because it is the last day of the week and the weekend reminds me of the days when there is no school."* His expression as the herald (reminder) of the Saturday-Sunday weekend can actually be interpreted as stating that school is a tiring and repulsive factor. Students' use of metaphors such as (FS10-4, MS9-3, FS9-9, FS12-8, MS11-7) *Semi-Open Prison, Prison, Educational Prison, Children's Prison* and *"Entering and exiting with permission. The warden is like the prison warden."* *"It's the same with their sentries, their walls, and our interrogation."* It is thought that this is another way of expressing that students see school as a place where they are stuck or an environment where they are punished. It has been determined that the metaphors produced by the students are in line with the results of the metaphor study of the students' school principals by Şahin and Sabancı (2018). Regarding school metaphors, it was determined that a student (FS9-11) compared the school to a *labyrinth*. The reason for this metaphor is *"It is a very complex and difficult structure in terms of the lessons and the people in it."* It is thought that the school is trying to give a clue about stakeholder relations. Likewise, it is seen that one student (FS11-6) likened the school to the Farm and the students to the Sheep flock. She told as a justification, *"The best fed animals on farms are taken to slaughter; the most successful of us also benefit from school, but it is wasted."* It is thought that she talked about the difficulties in choosing a profession in the education system.

The third sub-problem of the research was prepared as factors that increase or decrease school satisfaction according to the opinions of Anatolian high school students. In the qualitative interviews conducted to find answers

to this sub-problem, the following results were obtained: According to the opinions of the students, it was determined that the factors that increase their school satisfaction were mostly answered as *my friends, my favourite teachers, my favourite lessons*, while the students answered the most as *curriculum, anxiety for future, weekly course schedule* for the factors that decrease school satisfaction. In terms of the dimensions of the school, these views of Anatolian high school students are compatible with the answers of "my favourite teachers", which increases school satisfaction, and the dimension *Student-Teacher Relationship and Communication*, which is determined to be the highest level of satisfaction. Again, one of the results of the research, *Curriculum, Weekly course schedule* answers to the factors that reduce school satisfaction, while the other dimension of the school, *Adequacy of Course Content, Program and Curriculum* has the lowest satisfaction level, which proves that it is in parallel with student opinions.

In the light of the findings, the following recommendations can be made:

- School buildings and gardens should have an aesthetic architectural structure that appeals to the psychology of the students.
- Social, cultural and artistic activities in schools should be increased in order to reduce the uniformity of the learning environment and the pressure of exams.
- Long-term plans should be included in the construction of schools, taking into account the social demographic and population growth.
- Relationships between student satisfaction and school engagement, school attendance and academic achievement variables can be examined.

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The Effect of Harezmi Education Model on the Computational Thinking Skills of Secondary School Students^{*}

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Abstract

This study aims to investigate the effect of using the Harezmi education model, which has been widely used in Turkey in recent years, in social studies teaching regarding computational thinking skills. Interviews were held with students and teachers seven months after the applications to determine the conceptual knowledge levels of students for computational thinking skills. Teachers' opinions regarding students' feedback and the changes they observed in the students involved in the application process during the seven months were taken. Besides using one of the mixed-method research designs in this study, that is the triangulation (parallel-convergent) design, quantitative and qualitative data collection tools were used simultaneously. Through the joint use of different methods and data collection tools, obtaining rich and various types of data sets was aimed. As for the quantitative dimension of the study, 54 students, which were divided into experimental and control groups, formed the study group. In the qualitative aspect of the study, there are 20 students and three teachers. The computational thinking self-efficacy perception scale was used as a quantitative data collection tool, and the interview forms were used as qualitative data collection tools. While the analysis of quantitative data was made with Wilcoxon signed rank and Mann-Whitney U tests, the analysis of qualitative data was made with content analysis and descriptive analysis methods. As a result, a significant difference was found in the experimental group students' algorithm sub-dimension scores. According to the interviews held seven months after the applications, students' conceptual knowledge was at a good level. Furthermore, teachers included in the application stated that they observed positive changes in the students after the application. In line with the results obtained, suggestions were made to make arrangements for other sub-dimensions of computational thinking skills and to examine the effects of the Harezmi education model as of different variables.

Keywords: Social Studies Teaching, Harezmi Education Model, Computational Thinking, Alternative Education

1. Introduction

^{*} This study is derived from a part of the study named "The Application of the Harezmi Education Model in Social Studies Lesson" prepared at Marmara University Institute of Educational Sciences, Department of Social Studies Education. The study was carried out by Ahmet Tokmak. Advisors: Prof. Dr. Ali Yılmaz, Assoc. Dr. Mustafa Şeker

Hence the changing needs of humanity, innovations and developments happen in different areas of our lives. One of the most affected areas of this change is education. Across the world, country policies regarding education are renovated in terms of needs. This change brings along the need to develop and use new educational models, methods and techniques in favour of education and teaching processes. STEM education, which emerged with the integration of computer science and technology into teaching, can be given as an example (Basham and Marino, 2013, p.8; Bryan, Tamara, Johnson, Roehring, 2016, p.23; Corlu, Capraro, 2014). This awareness realized with STEM education has contributed to the emergence of the Harezmi education model as a new education model in Turkey.

The Harezmi education model aims to develop students' high-order thinking skills such as critical thinking, original thinking and problem solving; Enable students to acquire media literacy and information and communication skills; And equip students with features such as self-management, adaptation to teamwork, acting in cooperation, communicating, and showing leadership as part of basic life skills (MONE, 2021b).

The Harezmi education model aims to gain the ability to solve a problem by using the steps of the scientific method. This problem can be a problem in life or any subject or issue within a subject area. In the solution process of this problem, which students and practitioner teachers decide together, five grounds that form the soul of the Harezmi education model should be considered. The solution process should be planned relatedly with the five main grounds (interdisciplinary approach, computational thinking, programming, robotics and game design, and life skills) and with the participation of at least three different discipline teachers. Teachers from various disciplines, such as science-mathematics, social sciences and information technologies, take part in the process (Altınöz et al., 2018). They have equal roles in this process and act together in the design and evaluation processes. In this model, education is based on a process that is carried out by the action of different disciplines due to the five grounds and the nature of the model. The achievements and skills obtained during the solution process of the problem are evaluated with an output, if possible. This process, which is carried out with the coupling of different disciplines, allows students to think multi-dimensionally and use their knowledge and skills in various fields completely. Here, students are also expected to develop their higher-order thinking skills (Koçoğlu, 2018).

The process consists of the teachers' lesson designs and the intertwined planning of topics and diverse disciplines. Thus, students can develop their mathematics skills in a subject related to social sciences or their technology skills in a topic related to mathematics-science (MONE, 2021a; Çorlu, 2016).

In the Harezmi education model, one of the practising principles determined by referring to the five main grounds, which are the substructure of the model, is the use of computational thinking skills in the problem solving process (Ceylan et al., 2019). Computational thinking skill, which appears in the literature as the concept of "computational thinking", is also referred to as computerese, informatical, calculative or computer thinking (Yıldırım, 2020, p.8). Computational thinking can be described as solving the problems encountered with a systematic planning or design by clearly handling the information processing processes. It refers to a process. In other words, it is a range of thinking and formulation in solutions to be determined for the problems encountered. (Wing, 2011; Kert, 2016, p.24). Also, it can be expressed as creating strategies through the use of different technological tools to solve problems (Allsop, 2016, p.15; CSTA, 2017). Moreover, it can be enhanced with coding activities (Üzümcü and Bay, 2018).

When the literature is reviewed, it is possible to come across studies examining the effects of different methods and techniques on the development of computational thinking skills. According to the study of Alsancak Sırakaya (2019) on the effect of programming teaching on computational thinking skills, a significant increase was determined in students' computational thinking skills at the end of the teaching process carried out with the programming fundamentals course. In the study conducted by Atman Uslu (2018), the effects of visual programming activities on the computational thinking skills of secondary school students were positive; Hence students' awareness of computer science increased. As per another study by Korkmaz and Oluk (2018), in which the effects of the Scratch application on students regarding algorithm and computational thinking were investigated, a significant positive contribution was made to the computational thinking skills of the student group included in the application. Kaya, Korkmaz, and Çakır (2020), in their study examining the effects of gamified robot activities on secondary school students' problem solving and computational thinking skills, concluded that

educational robot activities had a positive impact on students' computational thinking skills. In another study, Tutulmaz (2019), with his data visualization, design, application, and evaluation study for the development of computational thinking skills, stated that the practices contributed positively to the development of computational thinking skills.

In terms of developing computational thinking skills, different methods and technical applications carried out within various disciplines usually contribute positively to CTS. When the grounds that form the basis of the Harezmi education model are examined, it is clear that the model includes interdisciplinary studies, programming, algorithm studies, and data visualization studies used in the literature for the development of CTS. In this respect, the effect of the in-class activities carried out in the social studies course, which is present currently at the topic named "Science, Technology and Society", designed following the principles of the Harezmi education model was a matter of curiosity, and formed the primary motivation of the study. The six problems determined for the aim of the study are as follows:

1. How does the Harezmi education model affect students' computational thinking skills?
2. What is the conceptual knowledge level of the students regarding their computational thinking skills seven months after the application?
3. What are the views of the science, information technologies and visual arts teacher involved in the process seven months after the application?

2. Methods

This study was conducted according to mixed-method principles. This method consists of the collection of data with qualitative and quantitative data collection tools, the analysis process of the collected data, and the integration of the obtained information and results (Cresswell and Plano Clark, 2007). With this method, there is a potential to deal with the quantitative and qualitative aspects of the problems encountered separately. Thus, it is possible to understand the solution to the problem and the process of finding the truth in a rich and holistic framework (Yıldırım and Şimşek, 2016, p.323). Besides using one of the mixed-method research designs in this study, that is the triangulation (parallel-convergent) design, quantitative and qualitative data collection tools were used simultaneously. In the quantitative dimension of the study, a quasi-experimental design including pretest-posttest control groups was used. On the other hand, the case study design was used in the qualitative dimension of the study. With the joint use of different methods and data collection tools, obtaining rich and various types of data sets is aimed. Based on the predictions, the weaknesses of the qualitative or quantitative methods used in the study will be compensated by the strengths of another method.

2.1 Study Group

The implementation process of the study was carried out with 54 secondary school 7th-grade students in a public school in Izmir, Turkey, in the 2021-2022 academic year. Three teachers, including science, information technologies and visual arts teachers from other disciplines, were included in the implementation process of the study. The convenience sampling method was used to determine the students and teachers who participated in the study. Two study groups, experimental and control groups, were generated among the classes in which the researcher was working as a teacher, and the science, visual arts and information technology teachers of these classes were included in the study.

Table 1: Study Group

Groups	Class / Field	Male	Female	Total
Students Control Group	Class K	13	14	27
Students Experimental Group	Class I	15	12	27
Teachers Group	Social Studies Teacher (Researcher)	1	0	4
	Science Teacher	0	1	
	Information Technologies Teacher (ICT)	1	0	
	Visual Arts Teacher	1	1	

2.2 Data Collection Tools and Data Analysis

Two types of data collection tools were used for the quantitative and qualitative dimensions of the study. The "Self-efficacy perception scale for computational thinking skills" by Gülbahar, Kert, and Kalelioğlu (2019) was used to determine the computational thinking skills of the students. The scale, which was applied as a pre-test and post-test, was designed in a five-factor structure with 39 items. During the validation of the model, three items were excluded from the scale with the confirmatory factor analysis; Hence the final form was given with 36 items. The item-total correlation values of the scale were measured between 0.632 and 0.386. Cronbach's alpha coefficients were found to vary between 0.762 and 0.930 points. Accordingly, the differences between the items were significant based on the measurement results made by the t-test and the lower-upper group method.

In the qualitative dimension of the study, teachers' opinions on the application process were taken both at the end of the process and nine months after the application. A semi-structured interview form was used to collect teachers' opinions. As part of the purpose of the form, teachers were asked about their views on student observations regarding the effect of the process. In the interviews with the students nine months after the application, the interview form developed by the researcher was used. Regarding the student interview form, it was aimed to determine what students remember about the concepts related to computational thinking skills and questions were asked about what they remember about the application process.

The analysis of the quantitative data was conducted with the SPSS statistics software. The Wilcoxon signed-rank and Mann-Whitney U tests were used in the analysis of the data obtained to determine the change experienced by students in their computational thinking skills. The analysis of the data obtained from the students and teachers through the interview forms was carried out with content analysis and descriptive analysis methods.

2.3 Implementation Process

During the study process, seven activities were carried out in the experimental group. Science, information technologies and visual arts teachers were involved in the implementation process together with the researcher teacher in the activities determined in line with the target acquisitions of science, technology and society learning area. Regarding the experimental group, seven-week activities were carried out, including puzzle design with a puzzle maker, scientists visualization, infographic preparation, ink-making experiment, water clock experiment, steam turbine experiment, and thought jars. As for the control group, education was carried out in the field of science, technology and society learning in line with the annual plan determined by the decision of the group teachers' board.

3. Results

In this part, the results related to the sub-problems determined as per the aim of the study are given.

3.1 Results Related to the Effect of Harezmi Education Model on Students' Computational Thinking Skills

The data and analysis results of the scale, which was applied to the experimental group and the control group twice (before and after the application), were handled under three independent headings that are the results of the experimental group, the results of the control group, and the statistics regarding the comparison of the experimental group and the control group.

3.1.2. Results Regarding the Experimental Group

The descriptive data of the scale were handled separately including five sections that make up the scale. Also given gregariously under the title of Computational Thinking Skill. In addition, statistical information of the sections and the total scale statistics are shown in Table 2 as a whole.

Table 2: Descriptive Statistics of the Experimental Group

Scale/Test	Test Period	n	Min.	Max.	\bar{X}	SD	S.	K.
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Algorithm Competence	Design	Pre-test	27	1	27	13,52	4,73	0,65	-0,47
		Post-test	27	1	27	23,11	3,08	-0,83	-0,21
Problem Competence	Solving	Pre-test	27	1	30	24,70	3,27	-0,56	-0,39
		Post-test	27	1	30	25,93	3,05	-0,67	-0,20
Data Competence	Processing	Pre-test	27	1	21	15,00	3,65	-0,51	0,27
		Post-test	27	1	21	17,89	2,65	-1,10	1,68
Basic Competence	Programming	Pre-test	27	1	15	9,26	2,35	0,20	-0,47
		Post-test	27	1	15	11,19	3,16	-0,41	-0,80
Self Competence	Confidence	Pre-test	27	1	15	11,78	2,31	-0,66	0,32
		Post-test	27	1	15	12,89	1,95	-0,37	-1,15
COMPUTATIONAL THINKING SKILL		Pre-test	27	1	108	74,26	10,15	0,14	0,22
		Post-test	27	1	108	91,00	11,93	-0,70	-0,21

The computational thinking skills total score of the experimental group in the pre-test was determined as 74.26 ± 10.15 and in the post-test as 91.00 ± 11.93 .

After the 7-week Harezmi education model-based activities carried out with the experimental group, the self-efficacy perception scale regarding computational thinking skills was reapplied. The Wilcoxon signed-rank test was used to determine which tests differed between pre-test and post-test measurements. Table 3 shows the analysis of the comparison of test scores.

Table 3: The Comparison of Experimental Group's Pre-Test and Post-Test Scores

Scale/Test		n	Rank Avg.	Rank Sum	Z	p
Algorithm Competence Post-Test-Pre-Test	Design	Negative Ranks	0	0,00	-4,54	0,000
		Positive Ranks	27	14,00		
		Equality	0			
		Total	27			
Problem Competence Post-Test-Pre-Test	Solving	Negative Ranks	6	11,67	-2,08	0,037
		Positive Ranks	17	12,12		
		Equality	4			
		Total	27			
Data Competence Post-Test-Pre-Test	Processing	Negative Ranks	5	7,20	-3,11	0,002
		Positive Ranks	18	13,33		
		Equality	4			
		Total	27			
Basic Competence Post-Test-Pre-Test	Programming	Negative Ranks	7	12,57	-2,01	0,044
		Positive Ranks	18	13,17		
		Equality	2			
		Total	27			

Self Confidence Competence Post-Test-Pre-Test	Negative Ranks	6	9,08	54,50	-2,14	0,032
	Positive Ranks	15	11,77	176,50		
	Equality	6				
	Total	27				
COMPUTATIONAL THINKING SKILL Post-Test-Pre-Test	Negative Ranks	2	8,00	16,00	-4,16	0,000
	Positive Ranks	25	14,48	362,00		
	Equality	0				
	Total	27				

Accordingly, there is a significant difference between the post-test and pre-test scores of the experimental group regarding algorithm design competence ($Z=-4.54$; $p<0.05$), problem solving competence ($Z=-2.08$; $p<0.05$), data processing competence ($Z=-3.11$; $p<0.05$), basic programming competence ($Z=-2.01$; $p<0.05$), self confidence competence ($Z=-2.32$; $p<0.05$), and computational thinking skills ($Z=-4,16$; $p<0.05$). As to the Wilcoxon signed-rank test results;

- After the application of the Harezmi education model, the algorithm design competence score of all the students increased, which means the model has a positive and significant effect on students' ability to design algorithms.
- After the application of the Harezmi education model, the problem solving competence scores of 17 students increased, six students decreased, and the scores of four students did not change. To conclude, the model has a positive and significant effect on student's problem solving competence.
- Since the application of the Harezmi education model, the data processing competence scores of 18 students increased, five students decreased, and the scores of four students did not change. As a result, the Harezmi education model has a positive and significant effect on the data processing competence of the students.
- After the application of the Harezmi education model, the data processing competence scores of 18 students increased, five students decreased, and the scores of four students did not change. As a result, the Harezmi education model has a positive and significant effect on the data processing competence of the students.
- With the application of the Harezmi education model, the self-confidence competence scores of 15 students increased, six students decreased, and the scores of six students did not change. As a consequence, the Harezmi education model has a positive and significant effect on students' self-confidence competence.
- After the application of the Harezmi education model, the computational thinking skill score of 25 students increased and two students decreased. So, it is clear that the Harezmi education model has a positive and significant effect on students' computational thinking skills.

3.1.3. Results Regarding the Control Group

The Self-Efficacy Perception Scale for Computational Thinking Skills was applied to the control group twice, before and at the end of the education process, which was carried out within the framework of textbooks and reference books as per the annual acquisition plans of the Ministry of National Education. In addition, it was not planned based on the Harezmi education model or any alternative education model. Descriptive statistics for the control group are shown in Table 4.

Table 4: Descriptive Statistics of the Control Group

Scale/Test	Test Period	n	Min.	Max.	\bar{X}	SD	S.	K.
Algorithm Competence	Pre-test	27	1	27	15,44	5,00	0,47	-0,50
	Post-test	27	1	27	19,26	5,52	-0,24	-1,16
Problem Solving Competence	Pre-test	27	1	30	24,74	3,15	-1,51	2,78
	Post-test	27	1	30	26,48	2,83	-1,64	3,63

Data Competence	Processing	Pre-test	27	1	21	16,04	3,37	-0,68	-0,64
		Post-test	27	1	21	17,22	3,60	-1,05	0,16
Basic Competence	Programming	Pre-test	27	1	15	10,22	2,75	0,11	-1,17
		Post-test	27	1	15	11,11	3,34	-0,61	-1,11
Self Competence	Confidence	Pre-test	27	1	15	12,26	2,41	-0,99	-0,02
		Post-test	27	1	15	13,04	1,87	-0,86	-0,52
COMPUTATIONAL THINKING SKILL		Pre-test	27	1	108	78,70	11,3	0,05	0,38
		Post-test	27	1	108	87,11	13,8	-0,78	-0,08

The computational thinking skills total score of the control group in the pre-test was determined as 78.70 ± 11.93 and in the post-test score as 87.11 ± 13.78 . The average of the algorithm design competence was determined as 15.44 in the pre-test and 19.26 in the post-test, regarding problem-solving competence, it was 24.74 in the pre-test and 26.48 in the post-test, for data processing competence it was 16.04 in the pre-test and 17.22 in the post-test, as for the basic programming competence it as 10.22 in the pre-test and 11.11 in the post-test, and finally, for the self confidence competence, it was 12.26 in the pre-test and 13.04 in the post-test.

As per the tests applied according to the Friedman test results, significant differences were found in the sum of algorithm design, problem solving, data processing competencies and computational thinking skills. The Wilcoxon signed-rank test was used to determine which tests differed between pre-test and post-test measurements. The test results are given in Table 5.

Table 5: The Comparison of Control Group's Pre-Test and Post-Test Scores

Scale/Test		n	Rank Avg.	Rank Sum	Z	p
Algorithm Competence Post-Test-Pre-Test	Design	Negative Ranks	7	10,93	-2,52	0,012
		Positive Ranks	19	14,45		
		Equality	1			
		Total	27	76,50		
Problem Competence Post-Test-Pre-Test	Solving	Negative Ranks	5	11,70	-2,22	0,026
		Positive Ranks	17	11,44		
		Equality	5			
		Total	27	194,50		
Data Competence Post-Test-Pre-Test	Processing	Negative Ranks	6	10,17	-2,18	0,029
		Positive Ranks	16	12,00		
		Equality	5			
		Total	27	61,00		
Basic Competence Post-Test-Pre-Test	Programming	Negative Ranks	8	10,06	-1,22	0,222
		Positive Ranks	13	11,58		
		Equality	6			
		Total	27	80,50		
Self Competence Post-Test-Pre-Test	Confidence	Negative Ranks	10	7,90	-1,27	0,203
		Positive Ranks	11	13,82		
		Equality	6			

	Total	27				
COMPUTATIONAL THINKING SKILL Post-Test-Pre-Test	Negative Ranks	4	17,00	68,00	-2,73	0,006
	Positive Ranks	22	12,86	283,00		
	Equality	1				
	Total	27				

Accordingly, there was no significant difference between the post-test-pre-test scores of the control group's basic programming competence and self-confidence competence ($p > 0.05$); Yet, there were significant differences between the post-test and pre-test scores of the control group's algorithm design competence ($Z = -2.52$; $p < 0.05$), problem solving competence ($Z = -2.22$; $p < 0.05$), data processing competence ($Z = -2.18$; $p < 0.05$) and computational thinking skills ($Z = -2.73$; $p < 0.05$).

According to the Wilcoxon signed-rank test results;

- At the end of the teaching process in the control group, while the algorithm design competence score of 19 students increased, the score of seven students decreased, and in one student, the score did not change. As a result, the education given in line with the current Ministry of Education textbooks and plans has a positive and significant effect on the student's ability to design algorithms.
- At the end of the teaching process in the control group, the problem solving competence score of 16 students increased, the score of six students decreased, and the score of five students did not change. As a result, the education given in line with the current Ministry of Education textbooks and plans has a positive and significant effect on the problem solving competence of the students.
- While the data processing competence scores of 16 students increased, the scores of six students decreased, and five students' scores did not change. As a result, the education given in line with the current Ministry of Education textbooks and plans has a positive and significant effect on the data processing competence of the students.
- At the end of the teaching process of the control group, the computational thinking skill score of 22 students increased, the scores of four students decreased, and only one student's score remained unchanged. In conclusion, the education given in line with the current Ministry of Education textbooks and plans has a positive and significant effect on students' computational thinking skills in certain areas.

3.1.4 Results Regarding the Comparison of Experimental and Control Groups

The Mann-Whitney U test was used to determine whether there were significant differences between the pre-tests applied to the groups before the Science, Technology and Society learning courses, which will be taught with different methods in the experimental group and the control group.

The results of the comparison of the pre-test scores of the experimental and control groups directed to the Mann-Whitney U test are given in Table 6.

Table 6: The Comparison of Pre-Test Scores of Experimental and Control Groups

Scale/Test	Groups	N	Rank Avg.	Rank Sum	MWU	Z	p
Algorithm Competence	Design Experimental	27	24,06	649,50	271,50	-1,63	0,103
	Control	27	30,94	835,50			
Problem Competence	Solving Experimental	27	27,28	736,50	358,50	-0,10	0,917
	Control	27	27,72	748,50			
Data Competence	Processing Experimental	27	25,04	676,00	298,00	-1,16	0,248

		Control	27	29,96	809,00			
Basic Competence	Programming	Experimental	27	25,00	675,00	297,00	-1,18	0,239
		Control	27	30,00	810,00			
Self Competence	Confidence	Experimental	27	25,33	684,00	306,00	-1,02	0,305
		Control	27	29,67	801,00			
COMPUTATIONAL THINKING SKILL		Experimental	27	24,09	650,50	272,50	-1,59	0,111
		Control	27	30,91	834,50			

As per the pre-test results of the experimental and control groups according to the MWU test, the rate of algorithm design competence was determined as $p=0.103$, the problem-solving competence as $p=0.917$, the data processing competence as $p=0.248$, the basic programming competence as $p=0.239$, and the self-confidence competence as $p=0.305$. Also, no significant difference was found in the calculations regarding the sub-dimensions of the scale and total ($p>0.05$).

Following the pre-tests of the experimental and control groups, a 7-week application process was conducted. This process was carried out in an interdisciplinary manner with a program planned within the framework of the Harezmi education model in the experimental group; However, in the control group, the teaching process was retained based on the curriculum and books of the Ministry of National Education.

At the end of the application process, CTSPS (Computational thinking self-perception scale) was applied to both groups as a post-test, and the results were subjected to the Mann-Whitney U test. Information about the test results is given in Table 7.

Table 7: The Comparison of Post-Test Scores of Experimental and Control Groups

Scale/Test		Groups	N	Rank Avg.	Rank Sum	MWU	Z	p
Algorithm Competence	Design	Experimental	27	32,93	889,00	218,00	-2,55	0,011
		Control	27	22,07	596,00			
Problem Solving Competence		Experimental	27	25,83	697,50	319,50	-0,79	0,432
		Control	27	29,17	787,50			
Data Processing Competence		Experimental	27	28,19	761,00	346,00	-0,32	0,747
		Control	27	26,81	724,00			
Basic Competence	Programming	Experimental	27	27,69	747,50	359,50	-0,09	0,931
		Control	27	27,31	737,50			
Self Confidence Competence		Experimental	27	27,20	734,50	356,50	-0,14	0,888
		Control	27	27,80	750,50			
COMPUTATIONAL THINKING SKILL				29,70	802,00	305,00	-1,03	0,303
		Experimental	27	25,30	683,00			
		Control	27					

Consequently, the algorithm design competence scores of the experimental and control groups in the post-test differed significantly ($Z=-2.55$; $p<0.05$). In addition to that, the experimental group's algorithm design competence score in the post-test was notably higher than the control group's post-test scores. As a result, the algorithm design competence of the students studying with the Harezmi education model is remarkably better than the algorithm design competence of the students in the control group.

As per the determinations, the post-test problem solving, data processing, basic programming, and self-confidence competence scores and the post-test computational thinking skills scores of the experimental and control groups did not differ significantly ($p>0.05$).

3.2. Results Related to Students' Conceptual Knowledge Regarding Their Computational Thinking Skills

The seven-week application process, which was designed with the Harezmi education model regarding social studies teaching, was completed on April 22 in the 2021-2022 academic year. Interviews were held after the application to determine the permanence of students' conceptual knowledge in the context of computational thinking. Out of 27 students who were included in the application of the Harezmi education model in the 2021-2022 academic year, four students were not included in the interviews because they changed schools in the 2022-2023 academic year, and three students due to their absenteeism. Because of the decision of the school administration, classes are organized compositely at the beginning of each new academic year. For this reason, three different group interviews were conducted with the students at different times.

In the interviews with the students, the following questions were asked;

- What does algorithm mean?
- Can you give an example of an algorithm?
- What does problem solving mean to you?
- What does error mean?
- What does data mean? What does it mean to you?
- Can you give examples of data types?
- What would you like to say about programming?
- What does loop mean?

As per the results of the interviews with 20 students regarding the conceptual recall of students' computational thinking skills, the students produced 96 significant answers. Their answers were coded and themed by the content analysis method. Information regarding the themes, codings and frequencies are given in Table 8.

Table 8: Results Related to Students' Conceptual Recall

Topic	Theme	Codings	Frequency	Total Significant Frequency
Algorithm	Solution	Way	2	16
		Step by step	3	
		Process	4	
		Water clock	2	
		Stage	5	
		No significant answer	4	
Problem Solving	Succeed	Overcome	2	20
		Recognize	4	
		Battle	4	
		Finding the barrier to operability	3	
		Existence of the problem	2	
		Problem status	5	
Error	Problem	Mistake	2	15
		Deficiency	4	
		Problem	6	
		Failure	3	

Data	Information	Assembled	3	19
		Verbal data	2	
		Written data	2	
		Mathematical data	4	
		Source	3	
		Digital data	4	
		Information	1	
		No significant answer	1	
Programming	Tool	Computer	4	16
		Coding	5	
		Programming	3	
		A different language	2	
		Engineering	2	
		No significant answer	5	
Loop	Process	Start over	4	10
		Recycling	2	
		Programming	4	
		No significant answer	10	
TOTAL			116	96

Some answers given by the students are;

-ST1:..... I remember the pasta cooking algorithm, I always call it up...

-ST2:..... I remind myself of the water clock experiment...

-ST3:..... I remember it as doing something in a certain logical order. All material at our disposal may be complete. But it is important that we use it in the right order. That's how Algorithm stuck in my mind...

-ST4: When I think about problem-solving, I recognize it as solving a problem in life...

-ST5:... I think of solving the problem and succeeding. In other words, when I hear the word problem, I think of topics related to the solution rather than the existence of the problem. I want to find a way around it...

-ST6:... The thing that is preventing something from working...So there must be a problem...The effort or struggle to solve it...

-ST7:...I think problem solving requires an aim...

-ST8:... Now I know what data is. Because we use that word a lot in informatics class or something...

-ST9:...it can be of different types...verbal, mathematical...

-ST10:...Programming is also a language. It has spelling and pronunciation, like music notes...

-ST11:... Software engineering comes to my mind when I think of programming. It is very simple. You make a program for what you want to do. The codes will work if the program is correctly written, like Arduino.

3.3. Results Regarding Teachers' Opinions

The science, visual arts and information technology teachers were also involved in the 7-week application process carried out in the 2021-2022 academic year within the scope of the HEM-based social studies teaching course, together with the researcher-social studies teacher. Interviews were held to determine what the teachers remembered about the application seven months after and the feedback they received from the students included in the application. During the interviews, the following questions were asked to the teachers;

- What do you remember about the Harezmi education model we implemented last year? What would you like to say?
- Have you heard anything from the students about the application made last year in the new academic year?
- Do you think that the Harezmi education model made a change in students?
- Would you like to be involved in such a study again? Why?

The data obtained through the interviews with the science, visual arts, and information technologies teachers and the investigative social studies teacher were analyzed by the content analysis method. As a result of the analysis,

the codings and themes were created, and the frequencies were determined. The results obtained by data analysis are given in Table 9.

Table 9: Results on Teachers' Opinions

Topic	Theme	Codings	Frequency	Total
Harezmi Education Model	Interdisciplinarity	Different Disciplines	4	17
		Collaboration	4	
		Cooperation	4	
		STEM education	2	
		Problems in Life	2	
		Experiment	1	
Student Feedback	Activity	Willingness to work	4	10
		Tribute to the application	4	
		Student-teacher relationship	2	
Change in Students	Concretization	Arduino	2	11
		Scratch	2	
		Visualization of data	1	
		Experimental assignment	2	
		Scientific self-confidence	4	
The New Harezmi Education Model Application	Motivation	Efficacy	4	20
		Usefulness	2	
		Culture of collaboration	3	
		Reproduction of information	3	
		Learning culture	4	
		Problem-solving skill	3	

The initials of the course names were given as pseudonyms in the answers of the teachers (Science teacher - ST, Visual arts teacher - VAT, Information technologies teacher - ITT). Some of the answers of the teacher are as follows;

VAT: ... I got to know the Harezmi education model fully through the work we did last year. I said it last year. I strongly believe in the motivation created by unity. And the practice we did last year that I saw touched students' hearts. Interdisciplinary work is what I remember most clearly about the model when we start to talk about it. Uniting around a solution to a problem...

ITT:... The application we made last year was both relevant and functional. I understood that better this year. The questions of the students who were in the Harezmi practice class last year are much more meaningful this year. Last year, we actually broke the ground. It's about programming and Arduino. However, our practices were mostly about general things, but I saw that awareness has emerged in children...

ST:... Frankly, I remember that the application of the Harezmi education model was a beautiful but problematic process. I think the planning process was tiring. But some things stuck in children's minds. There was a student who said: "Algorithm is the importance of ordering" in one of the lectures the other day where we had some experimental activities. I said: "Well done!" and asked how he did paraphrase it like that. "Teacher, we learned the algorithm last year, you know, in the practice of Harezmi," he said. I was surprised. But children don't forget what they do willingly. I think the Harezmi education model gives this chance to children...

VAT:... Of course, some students often ask whether we can continue with the Harezmi education model and do an activity. Especially students who are good at painting ask this. Meanwhile, I think they see this model as an opportunity to show their talents....

ITT:... This year, we are working with the scratch application as part of the course. Some students still say, "Teacher, please invite our social studies teacher."...

ST:... Students began to ask for project assignments early this year, especially those who participated in the Harezmi practice last year. One of my students said: "If we determine a topic like the practice we did last year with 2 or 3 people. Each of us can take one part..." I said: "Okay". Let's see what comes out...

VAT:.. Teacher, of course, I would like to be a part of a new practice. It would be better if there were a few hours of work around a topic because a long application process makes it difficult...

ST:... Actually, I thought the same thing recently... I'm thinking of something to include the physical education teacher...

4. Discussion

In this study, in which social studies teaching was carried out in line with the principles of the Harezmi education model, the effects of the application on students were discussed from different perspectives. As a research question, it is aimed to investigate in which direction and in which sub-skills the change in students' computational thinking skills will take place. The Computational Thinking Self-Efficacy Perception scale was used to determine the change in students' computational thinking skills in the application process. The concept of computational thinking is considered one of the structures that are also known as the five grounds of the Harezmi education model and form the basis of the model. Although it has a diverse literature structure in terms of different definitions, studies and sub-dimensions, it is generally considered a skill that includes the sub-dimensions of abstraction, algorithmic thinking, problem solving, dissection, generalization, and error debugging (Üzümcü and Bay, 2018). The computational thinking skill appears in the Harezmi education model with the phrase "without using technology and computers" within five grounds. The aim here is to provide design planning for the use of CT skills in the problem solving process. The system created by computational thinking through the cycle of data collection, analysis, pattern finding, breaking down the problem, creating a model, preparing an algorithm, and producing a solution has similarities in terms of HEM (Harezmi Education Model) processes. In HEM, students are expected to collect data on the problematic situation they have determined, produce solutions by dividing the problem into parts, and draw a conclusion by creating and testing models in this process. In this respect, the social studies teaching course carried out with the Harezmi education model will have a positive effect on students' CT skills.

According to the study results, there were different levels of improvement in the CT skills sub-dimensions, jointly in the student group and the control group students, in which both social studies courses were HEM-designed. In addition to that, students in the experimental group made progress in all sub-dimensions of CT skills based on the pre-test results. As per the pre-test results of the control group students, this development was limited only to the sub-dimensions of algorithm design competence, problem solving competence, and data processing competence. In the evaluation made between the two groups, it was determined that the algorithm design competencies of the experimental group students, who had a HEM-designed teaching process, differed significantly compared to the results of the control group students. In this respect, HEM has a positive effect in terms of designing algorithms and creating patterns. No significant results were obtained in favour of the experimental group in other dimensions of computational thinking skills. With this in mind, planning a HEM-designed social studies course by considering only one dimension of the computational thinking skill would be more effective rather than considering CT skills as a whole. Although there is no study in the literature investigating the effects of HEM on CT skills, there are studies concerning CT skills.

Arslan Namlı's (2022) study with 5th-grade students in the context of the effect of block-based programming and computer-free computer science teaching activities on computational thinking skills, self-efficacy, and academic success shows similarities with this study in which HEM-designed social studies teaching was carried out, in terms of results. She tested the effect of the teaching activities carried out in her study using scales. And she concluded that there was no significant difference between groups in the results obtained from the CT achievement test, which was used to measure students' computational thinking skills, yet the groups showed an improvement in their CT skills. In addition, she stated as per the results of the CT self-efficacy scale that there was no significant difference between the groups regarding all CT skills; However, there were significant differences within the group and these differences were realized in terms of certain sub-dimensions which were logical inquiry, abstraction, decomposition and generalization. According to the results she obtained with the qualitative data collection tools, students improved themselves in algorithm, programming and coding compared to the pre-application. Also, the positive difference made by this study for certain sub-dimensions within the scope of CT skills is similar to the significant differences obtained only in certain dimensions by HEM-designed social studies teaching.

Bolat (2020) conducted a study with 10th-grade students to measure the effect of stem-based activities on students' problem solving and computational thinking skills and found that teaching activities made a significant difference for certain sub-dimensions regarding CT skills.

Yanış Kelleci (2020) investigated the effect of educational robotic applications in different dimensions in his study. According to his study, the experimental group students showed improvement within the scope of CT skills. However, when this positive change is evaluated in terms of the relevant sub-dimensions, it has created a significant difference in the sub-dimensions of algorithmic thinking, originality, and critical thinking. This difference was not reflected in the cooperative thinking and problem solving sub-dimensions. For this reason, when the studies discussed in the literature within the scope of the effect of different teaching activities and methods on CT skills are examined, the impact of HEM-based social studies teaching regarding CT skills is limited to sub-dimensions, and similar results are frequently encountered. The reason for this may be that the effects of the methods and teaching models used are limited to certain areas regarding CT skills, include comprehensive competencies, and need to be endorsed with a wide range of activities.

As per the results of the interviews conducted with the students seven months after the application process, students' conceptual knowledge status regarding computational thinking skills were at a good level. Based on the answers given to the questions about the concepts of algorithm, problem solving, error, data, programming, and loop, students produced 96 significant frequencies. The subjects in which the students generate the most meaningful frequencies are problem solving (20), data (19), programming (16) and algorithm (16). In addition, following the students' answers, they could still use their learning about the concepts within the scope of the Harezmi education model applications that were carried out seven months ago. One of the main underlying reasons for the excellent level of conceptual knowledge of the students on the subject can be shown as the fact that the students are in continuous learning about the existing concepts in the information technologies course. However, in the explanations made by the students together with this learning, they still made a positive impression about the permanence of the application process by taking the HEM model applications as a reference and giving examples. On the other hand, the opinions of other discipline teachers, who took part in the application process, about HEM seven months after its application, support the results obtained from the students. Teachers, who expressed that students' frequently desired to practice in the new academic year with HEM, stated that they thought the application also started a process of awareness and change in students. The same teachers, who stated that the model had positive effects on students in terms of gaining scientific self-confidence, also expressed that the model had positive results regarding cooperation, problem solving, and collaborative working culture for students. According to the study by Yıldırım and Selvi (2017), STEM applications have a positive effect on permanent learning. In the study by Akgündüz and Akpınar (2018), it was concluded that STEM applications are vital for the education of students in terms of gaining 21st-century skills and ensuring their permanence. Similarly, in the study conducted by Kıvanç Contuk and Atay (2021), the importance of the Harezmi education model, which has been implemented in our country, was emphasized in terms of student and teacher development and its positive effects on permanent learning was expressed. To conclude, the results of the Harezmi education model on permanent learning, in which students have the opportunity to learn by doing and experience and where it is possible to evaluate a problem or a discipline-specific issue within the framework of different disciplines, are favourable.

In line with the study results, suggestions can be made on the generalization of the use of the Harezmi education model, mentioning it in universities to strengthen its theoretical infrastructure, conducting studies to examine the effects of the Harezmi education model in terms of distinctive variables, conducting meta-analysis or phenomenological studies to determine its differences from the STEM education, and preparing Harezmi-designed lesson plans for the dimensions of computational thinking skills that did not get positive results in this study.

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Examining Algebraic Habits of the Mind through a Problem Solving: Elementary School Example

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Abstract

In this study, it is aimed to determine the algebraic thinking habits of two eighth grade school students through the answers they gave in the process of solving mathematical problems. The algebraic habits of mind (ZCA) theoretical framework developed by Driscoll (1999) was used to reveal these thinking habits. The research design of this study is a case study and the participants consist of two eighth grade students. The data were analyzed using Driscoll (1999)'s ZCA framework, which is algebraic habits of mind. Descriptive analysis was used in the analysis of the data. When we look at the findings obtained from the research; It is seen that both students can do describing a rule and justifying a rule in the solutions of the problems. In addition, it is seen that computational shortcuts, equivalent expressions and symbolic expressions come to the fore in the solutions of students' problems. On the other hand, the habit of undoing in solving problems was not encountered very rarely in both students. In the light of the findings obtained, the reasons for the existing and non-existent algebraic habits of mind are discussed. As a result of this discussion, it is thought that it is effective to include guide questions to create and develop algebraic thinking habits in students in classroom teaching practices of teachers.

Keywords: Algebraic Thinking, Algebraic Habits of Mind, Elementary Students, Problem Solving

1. Introduction

1.1 Introduce the Problem

Algebraic thinking is a system of thought that includes the use of many mathematical skills (mathematical modelling, reasoning, justification, use of different representations, etc.) (Kaf, 2007). This way of thinking offers the individual a perspective that enables the construction, structuring and use of an algebraic concept, that is, the ability to think mathematically (Hawker & Cowley, 1997; Eroğlu ve Tanışlı, 2017; Sezer & Altun, 2020). In gaining this perspective; Booker & Windsor (2010) first, individuals are experienced with concrete number values, then generalizations through problem solving and finally moving towards abstract thinking come (Vygotsky, 1997; Mason, 2008; Booker & Windsor, 2010; Radford & Sabena, 2015).

The beginning and completion of this process are formally formed in classroom teaching practices. As a matter of fact, when we look at the literature, there are studies showing that it is important to provide students with algebraic

thinking skills and to develop them in their mathematics teaching (Herbert & Brown, 1997; Magiera, Van den Kieboom & Moyer, 2013; Magiera, Moyer & Van den Kieboom, 2017). For this reason, it has been a matter of curiosity about the practices that teachers have made in their classroom teaching for their students to gain algebraic thinking skills. Among these applications, it was determined that problem solving is effective in the development of mathematical thinking skills (Herbert & Brown, 1997; Driscoll, 1999; Kaf, 2007; Bilgiç & Argün, 2018). As a matter of fact, when we look at problem solving, it is seen that it constitutes the largest part of the education curriculum by the American National Mathematics Association (National Council of Teachers of Mathematics [NCTM], 2000). Problem solving enables students to make choices about which operations to use and to make some decisions regarding the application steps by using the information contained in the problem (Montague, Applegate & Marquard, 1993). Therefore, as in all academic skills, cognitive and metacognitive strategies and operations are used to perform such operations in order to solve mathematical problems. On the other hand, it has been supported by studies that problem solving plays an important role in the development of mathematics learning and mathematical thinking (Kaput, 2008; Kaput, Blanton & Moreno, 2008; Schliemann, Carraher & Brizuela, 2007; Lins, Rojano, Bell & Sutherland, 2001). In problem solving, it is a process that first requires the determination and analysis of the characteristics of the problem, then the design of a plan for the problem in the problem, and finally, the implementation of the plan (Polya, 1973). Problem solving, which requires a mental process and includes cognitive and metacognitive strategies (Pourdavood, McCarthy & McCafferty, 2020; Polotskaia, Fellus, Cavalcante & Savard, 2022) to fulfill the steps, emerges as an important tool in forming, developing and determining the algebraic thinking habits of the mind.

In the light of the information given above, it is the aim of this research to determine whether students have algebraic thinking habits or not through problem solving. In line with the purpose of the research, the answer to the following question was sought:

- What are the algebraic thinking habits that two 8th grade students use while solving algebra problems?

2. Theoretical Framework

Driscoll (1999) states that making mathematical generalizations, seeing mathematical relationships and interacting with them improve students' mathematical thinking skills. As a matter of fact, one of the tools used while providing this development is the problem solving method. In this context, Schoenfeld (1992) states that students develop a deeper understanding of mathematics while solving mathematical problems, and as a result, it is effective in their conceptualization of the learned mathematics. In addition, Booker & Windsor (2010) stated that problem solving is a powerful way to learn algebraic thinking of students. Thus, students' involvement in mathematical experiences that go beyond routine arithmetic problems creates opportunities for them to develop their algebraic thinking (Silver, Ghouseini, Gosen, Charalambous & Strawhun, 2005, p. 288).

For the last two decades, problems have been created to support the development of algebraic habits of mind (Driscoll, 1999; Kieran & Chalouh, 1993; Lee, 2002; Mason, 1987, 1989; Swafford & Langrall 2000; Eroğlu & Tanışlı, 2017; Caesar, 2020). The problems created should be of a quality that can enable students to think algebraically in order to effectively progress the problem solving stages in classroom teaching practices (Windsor, 2010). This has revealed the necessity for teachers to ask guiding questions about the given problems in order to activate students' algebraic thinking (Blanton & Kaput, 2011; Moss & McNab, 2011; Britt & Irwine, 2011). Blanton & Kaput (2011) stated that the teacher's guide questions should be in a way that directs students from arithmetic operations to algebraic actions. This situation simultaneously develops students' thinking habits about algorithmic and functional processes (Driscoll, 1999). In the light of the aforementioned, it has become an important issue what the thinking habits of the students are that activate their algebraic thinking and what their characteristics are. In the literature, the characteristics of the mind's thinking habits have not been determined to be completely specific. However, there are frameworks to develop students' algebraic thinking. What these frameworks are and the indicators with explanations for the frameworks are shown in Table 1.

Table 1: Theoretical frameworks for algebraic thinking in the literature

Literature	Explanation
Hart et al., (1998)	According to the findings of a project carried out in England by "Concepts in Secondary Mathematics and Science" to reveal students' understanding of algebraic expressions, the development of students' understanding of algebraic expressions can be examined in four consecutive stages.
Kaput (1998)	It presented four sub-themes of algebraic thinking and presented a theoretical framework for analysing students' algebraic thinking abilities. The theoretical framework consists of "generalized arithmetic, functional thinking, modelling, algebraic abstraction and algebraic proof" sub-themes.
"Algebraic Habits of Mind" (ZCA) Driscoll (1999)	In the study of Driscoll (1999), ZCA created three main themes: "doing-undoing, building rules to represent functions and abstraction from computation".
Chimanoi, Pitta-Pattazi & Christou (2018)	They created a theoretical framework in which algebraic thinking can be defined more consistently in 4 dimensions: reasoning styles, processes, concepts and topics.

Looking at the frames in Table 1, it is seen that there is a spiral extending from arithmetic operations to abstraction skills. Within the framework of Driscoll (1999), it also offers guidance questions to teachers that will improve students' algebraic thinking. Thus, it differs from other theoretical frameworks in the literature in terms of revealing students' algebraic thinking. In addition, Driscoll (1999) algebraic habits of mind theoretical framework were used in this study, since it was aimed to reveal what the algebraic thinking habits of two 8th grade students were.

2.1. Algebraic Habits of Mind

Driscoll (1999) conceptualized the Building Rules to Represent Functions and Abstracting from Computation as habits of mind, which are under the umbrella of the Doing-Undoing habit of algebraic thought (Figure 1).

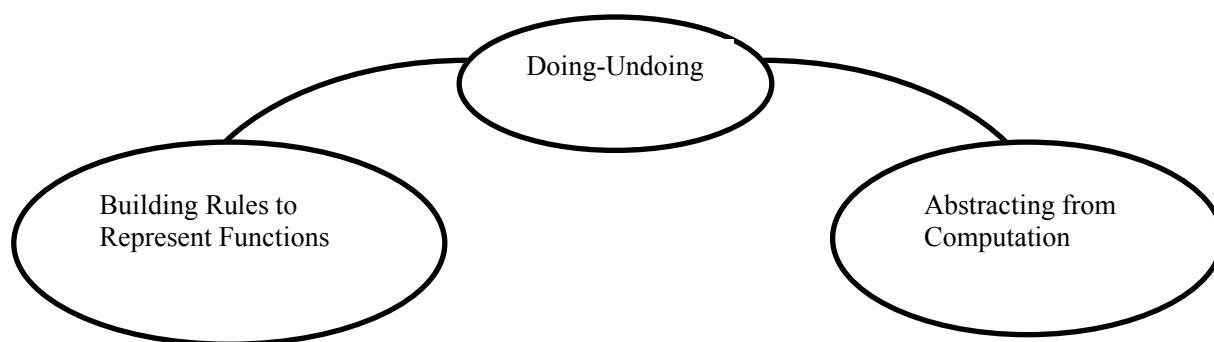


Figure 1: Algebraic Habits of Mind

Doing-Undoing: This algebraic habit of mind acts as a framework for the other two habits. Students should be able to conclude an operation related to algebra and reach the starting point by working backwards from the result of an operation for which they found the result. Thanks to this mental habit, students do not only focus on reaching the result, but also think about the process (Driscoll, 1999). For example, if $4x^2 - 9 = 7$, they should be able to find the solution of this equation as well as form the equation whose roots are $x = 2$ and $x = -2$.

Building Rules to Represent Functions: It is important to recognize patterns from algebraic thinking processes and to generate data to represent these situations. This mental habit involves some thought processes in middle school algebra. These processes are; recognizing and analyzing patterns, investigating and representing relationships, making generalizations beyond specific examples, analyzing how processes or relationships have changed, looking for evidence of how and why rules and procedures work (Magiera, Van den Kieboom & Moyer, 2013).

Abstracting from Computation: It is the capacity to think about calculations regardless of the numbers used. Abstraction is important for this habit of mind. Abstraction is the process of extracting mathematical objects and relations based on generalization (Lew, 2004).

Thus, in this study, it is aimed to examine the algebraic thoughts of two 8th grade students through problems within the framework of Driscoll's (1999) algebraic habits of mind. In line with this purpose, it is aimed that the teacher will bring out the algebraic habits of the mind given above through algebraic problems.

3. Method

3.1 Research Design

The method of this research is case study. A case study is a qualitative research approach in which the researcher examines one or more limited cases over time with data collection tools (observations, interviews, audio-visuals, documents, reports) that includes multiple sources, and defines situations and situation-related themes (Creswell, 2007). Accordingly, it would not be wrong to claim that the case study is an appropriate method to understand what the algebraic thinking habits of 8th grade students are. As a matter of fact, the case study is the best approach in terms of this research as it is a clear definition of the phenomenon in the study and an effective research method (Dörnyei, 2007) in generating new hypotheses, models and understandings about this phenomenon. Within the scope of the study, two 8th grade students were asked to express aloud their answers, routes and justifications for the given problems.

3.2 Participants

The present study was conducted with two 8th grade students attending a public school in Gaziantep, Turkey. Purposive sampling was chosen as the sample. Purposeful sampling is expressed as a method that will contribute to the in-depth study of selected individuals with the aim of identifying similar situations within the sample group (Creswell, 2007). The academic achievements of the students in the mathematics course are equivalent, and both students are female.

3.3 Data Collection Process

One of the techniques used in the evaluation of cognitive and metacognitive thinking is a-think aloud protocols. AThink-aloud protocols are a method of data collection in which participants verbally state everything they think and do during activities such as reading a given passage or solving a mathematical problem (Ostad & Sorenson, 2007; Rosenzweig, Krawec, & Montague). , 2011; Sweeney, 2010; Veenman & Spaans, 2005). The data obtained through a-think aloud protocol is usually audio recorded or video-recorded, and then the data is transcribed (Van Hout-Wolters, 2000). The data in the transcripts are analyzed and evaluated in line with cognitive and metacognitive thinking (Rosenzweig et al., 2011; Sweeney, 2010). Since the implementation of the a-think aloud protocol takes place in an applied activity such as reading a text or solving a mathematical problem, it is stated as the most important advantage of obtaining detailed information about the mental processes of the participants (Van Hout-Wolters, 2000). In the context of this view, data were collected through a-think aloud protocol within the scope of this study.

3.4. Data Collection Tool

As a data collection tool in the research, 2 problems related to pattern and equations under the algebra learning field and developed by Özdemir (2019) were used. With the first problem, it is aimed to examine the algebraic thinking habits of the participants related to pattern acquisition in the field of algebra learning. It is important to examine the algebraic thinking habits of the students about the pattern, since the concept of pattern forms the basis for the transition from arithmetic to algebra in the pre-algebra period. For this reason, one of the problems that we will examine the algebraic habits of the mind of the students has been selected within the scope of pattern acquisition. With the second problem, it is aimed to examine the algebraic thinking habits of the participants related to the acquisition of equations in the field of algebra learning. Since solving equations is a concept encountered in

all learning areas of mathematics, it is important to examine students' algebraic thinking habits about equations. For this reason, one of the problems that we will examine the algebraic habits of the mind of the students has been selected within the scope of equation acquisition.

Problem-1: Toothpicks Problem

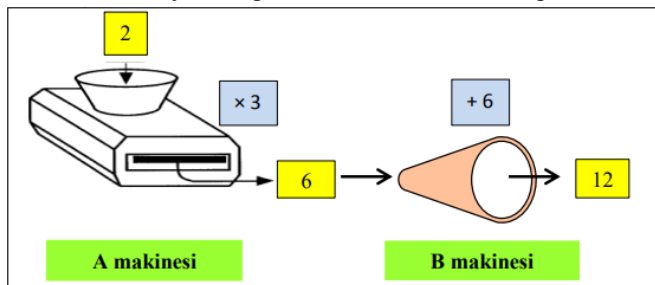
In the game they play, Ali and Ayşe try to build houses next to each other with toothpicks of equal size. Below are the houses that Ali and Ayşe built while playing this game. According to this,



- Calculate the number of toothpicks needed for 9 houses.
- If the number of toothpicks required for 42 houses is 169, how many toothpicks are required for 43 houses?
- Express algebraically the relationship between the number of houses and the number of toothpicks.
- Ali and Ayşe want to build houses with a different geometrical shape, again side by side, instead of “pentagon” shaped houses. Identify a different geometric shape to help Ayşe and Ali. Express algebraically the relationship between the number of toothpicks and the number of houses for the houses made of the geometry you have determined.

Problem-2: Equation Machine Problem

As A and B are two mathematical equation machines, when a number is put into machine A, the machine changes this number by multiplying it by 3. Next, the number from machine A enters machine B, and machine B modifies this number by adding 6 to it. Below is an example where the number 2 is inserted into machine A.



As seen in the example, machine A multiplied the inserted number by 3 and the number coming out of machine A became 6. Later this number entered machine B. Machine B changed the number by adding 6, and the number subtracted from machine B as 12. Answer the following questions according to the working principles of A and B machines.

- If the number 4 is placed in machine A, what will be the number that will enter machine B?
- When the numbers 7 and 12 are placed in machine A, respectively, what are the numbers coming out of machine B?
- When the number x is put into machine A, the number coming out of machine B becomes y . Accordingly, express the number y in terms of x .
- Determine another working rule for machines A and B so that the equality between the number entering machine A and the number leaving machine B does not change.

3.5. Data Analysis

The data obtained from the research were analyzed descriptively. In the descriptive analysis, the data are summarized and interpreted in terms of predetermined themes according to the research questions. In descriptive analysis, direct quotations are frequently used in order to strikingly reflect the discourses of the interviewees. The purpose of this analysis is to present the findings to the reader in a regular and blended manner (Yıldırım & Şimşek, 2011). In this context, the data recorded on video through a-think aloud protocol were analyzed using the theoretical framework of the study, Algebraic Habits of Mind, which was included in the study of Driscoll (1999). In the context of this framework, “Doing-Undoing, Building Rules to Represent Functions and Abstracting from Computation” by Driscoll, Zawojewski, Humez, Nikula, Goldsmith, Hammerman (2003), has been categorized

according to the characteristics of the algebraic habits of the mind. The categories and features of the framework are shown in Table 2.

Table 2: Feature of Algebraic Habits of the Mind (Driscoll et. al., 2003)

Categori	Feature Name	Description
Doing-Undoing	Input from output	Finding input from output, or initial conditions from a solution
	Working backward	Working the steps of a rule or procedure backward
Building Rules to Represent Functions	Organizing information	Organizing information in ways useful for uncovering patterns and the rules that define the patterns
	Predicting patterns	Noticing a rule at work and trying to predict how it works
	Chunking the information	Looking for repeating chunks in information that reveal how a pattern works
	Different representations	Wondering what different information about a situation or problem may be given by different representations, then trying the different representations
	Describing a rule	Describing the steps of a rule without using specific inputs
	Describing change	Describing change in a process or relationship
	Justifying a rule	Justifying why a rule works for "any number"
	Computational shortcuts	Looking for shortcuts in computation, based on an understanding of how operations work
Abstracting from Computation	Calculating without computing	Thinking about calculations independently of the particular numbers used
	Generalizing beyond examples	Going beyond a few examples to create generalized expressions, describe sets of numbers, or either state or conjecture the conditions under which particular mathematical statements are valid
	Equivalent expressions	Recognizing equivalence between expressions
	Symbolic expressions	Expressing generalizations about operations symbolically
	Justifying shortcuts	Using generalizations about operations to justify computational shortcuts

A transcript analysis of Driscoll (1999) evaluated within the scope of algebraic habits of mind is as follows:

Table 3: Example Transcript Analysis

Dialogue of Helin and Esra's Algebraic Thinking Processes in the Equation Machine Problem	Analysis
<p>1H: Helin is reading part b of the problem. Let's put the first number 7 in machine A. Then it comes out of machine A as $7 \times 3 = 21$. Then, machine B exits from machine B as $21 + 6 = 27$, <i>since machine B enters the number 21. Then if the number 12 enters machine A, $12 \times 3 = 36$, $36 + 6 = 42$.</i></p> <p>2T: When you enter 7, you say 26 comes out, when you enter 12, you say 42 subtracts. Esra, did Helin's action make sense?</p> <p>3E: Yes.</p> <p>4T: So when 100 enters machine A, how many will exit machine B?</p>	<p>Analysis of Helin's Algebraic Thinking Process;</p> <p>1st line; The expression "$7 \times 3 = 21$" contains the definition of the <i>equivalent expressions (EE-D)</i> code. After the expression, applying the rule of the equation machine to find the output for the number of inputs 12, multiplying by 3 and then adding 6 includes the definition of the <i>computational shortcuts (CS-D)</i> code.</p>

5H: *When 100 enters machine A, my teacher (expresses it on the board and then expresses it as 306) 306.*

6Ö: So when you enter the number n, what is the output?

7H: (Writes on the board) $3n+6$

8O: What is n?

9H: n is a number.

10Ö: So, it is the number we put in machine A. So what is the result?

11E: It is the number that comes out of machine B.

5th line; It contains the definition of *generalizing beyond examples (GBE-D)* code to reach generalization according to the condition of the number entering the equation machine being 100. In addition, expressing the answer for 100 as “306” as a result of mental operations includes the definition of the *calculating without computing (CWC-D)* code.

7th line; Expressing the rule as $3n+6$ for the number of n entries includes the definition of the *describing a rule (DaR-D)* code.

In the context of the reliability of the analysis of the data, two researchers independently analyzed the written student dialogues in the context of the algebraic habits of mind. According to the dimensions in the framework used in the descriptive analysis, the answers to the analyzes made by the researchers were compared and the questions with "Agreement" and "Disagreement" were determined. If the researchers expressed the same dimension in the relevant section, it was accepted as consensus, if they marked different options, it was accepted as disagreement. The reliability of the study was carried out using the formula and the average reliability was calculated. The “Percentage of Concordance” for this study was found to be 87% on average for algebraic habits of mind. This rate is considered reliable (Miles & Huberman, 1994). Although the rate obtained was accepted as reliable, the researchers came together and discussed the points of disagreement until they reached a consensus. In this way, the reliability of data analysis is increased.

4. Results

In line with the research problems determined in the research, "What are the algebraic thinking habits that two 8th grade students use while solving algebra problems?" The descriptive analyzes of students' a-thinking aloud protocol applications for each problem according to Driscoll et al (2003) are included in the following headings.

4.1 Algebraic thinking habits of students about the toothpick problem

The answers given by the students Helin and Esra to the toothpick problem and their algebraic thinking habits were observed as follows:

1H: How many toothpicks are needed for 9 houses, since *5 toothpicks are needed for each house*, $9 \times 5 = 45$. **CS-D**

2R: Are you sure about this answer? Esra, do you think your friend thinks right?

3E: It is as if an edge becomes common when combining. That's why we need to get 4.

4R: Can you show me?

DC-D

5E: So it goes like this. While forming *the first house and the second house in their conjunction, one side becomes common. From this we need to divide by 4.*

6H: But it's 5 toothpicks for a house.

7R: Let's think about it this way. How many houses are here? (Teacher shows the drawn house on the board)

8H: 3 of them.

9R: There are 3 houses. How many toothpicks were used in total for 3 houses?

10H: (counting toothpicks) 13

11E: But normally, according to Helin's calculation, there should have been 15. But 2 toothpicks are missing.

12H: Should we multiply by 3 then?

13R: How many houses did we create with 13 toothpicks?

14E: Then *let's divide 13 by 3*. **CS-D**

15R: All right, let's split it up, Esra.

16E: (Dividing) For 3 houses, then we multiply by 4. *1 more remains. Let's add that too.* **PP-D**

17R: Let's examine it now. Chapter 4 and the remainder 1. How many toothpicks did Esra use for the second house?

18E: (Counting) 4 of them.

19P: For the 3rd house?

20E: 4 of them.

21R: For the 1st house?

22E: 5 of them.

23R: What does this situation mean to you? (No answer) How many toothpicks do we need to build 4 houses?

24E: 17.

25R: Let's write that there are 17 toothpicks for 4 houses.

26E: (Writes the number of toothpicks on the board)

27R: How many toothpicks do we need for 5 houses?

28E: ***We add 4 over 17, 21. CS-D***

29R: 21 for 5 houses.

30E: (Writing on the board)

31R: Does what Esra wrote make sense to you?

32H: No, it doesn't.

33R: Does Esra make sense to you?

34E: Yes.

35R: Well, can you tell Helin?

36E: I think so. When we use 5 toothpicks in the 1st house, ***we add 4 toothpicks since one side is common*** when **JS-D** creating the second house.

37R: So after we build the first house, we add 4 toothpicks since there is a common edge in other houses. Is not it? Then we add 4 toothpicks at each stage. (Students approve)

38R: So how many toothpicks do we use for 100 houses?

39E: **401.**

40R: Did you use a rule for this?

41E: ***Increases by 4 each time. That's why I multiplied by 4 and then added 1. JR-D***

42R: Helin 43 How many toothpicks do we use for the house?

43H: ***Then I multiply 43 by 4 and add 1. Result 173. CS-D***

44R: Let's move on to the next question.

45H: Helin reads the question "Express the relationship between the number of houses and the number of toothpicks algebraically".

46E and H: Both say ***4n+1. DaR-D/SE-D***

47R: How did you find the rule?

48E: ***Since it increases by 4 each time, we need to multiply the number of houses by 4 and add 1. JR-D***

Helin approves of Esra.

49E: writes $4x+1$ on the board.

50R: So what is this x?

51H: x is the number of houses. The result we get is the number of toothpicks.

Esra also approves of Helin.

52R: So, is this rule valid for every number?

53H: Yes.

54E: Valid for all houses from the 2nd house.

55H: No. It is valid in the 1st house. ***Let's substitute 1 for x, we get 5. CS-D***

56R: Well, this rule is valid for every number.

Students say yes.

57R: How many houses would we build if we had 37 toothpicks?

58E: This one is different from the others. It becomes ***4x+1=37. From here we find 9 houses. EE-D/CWC-D***

59Ö: Helin How many houses would we build with 117 toothpicks?

60H: ***4x+1=117 (doing the operations), we find 29 houses. EE-D/CWC-D***

61R: So guys, does this rule work?

62E and H: Students say yes.

63E: Here we find the general term.

64R: So, what is this concept about?

65E and H: Students express as patterns.

66R: So you found a pattern. In particular, you actually found a series. So what kind of series is this?

67E and H: Students express it as an arithmetic sequence.

68T: So how do we show what we have done in the form of a table?

69H: Draws a rectangle on the board and splits it in half. It is written as the house number in the first column. Write the number of toothpicks in the second column. Then it refers to the toothpick numbers for the 1st, 2nd and 3rd houses.

70R: So how do we express it for what?

71H: $4n+1$. **DaR- D**

72E: *Exactly. it will be in the form of $4n+1$.* **DaR- D**

73R: Well, can we show it another way?

74E: *Draws graphs. It expresses the number of houses on the x-axis and the number of toothpicks on the y-axis. Writes numbers on the axes and connects the dots to show them as a line graph.* **DR- D**

75R: Okay, let's look at our last question.

76H: Helin "Ali and Ayşe want to build houses with a different geometric shape, again side by side, instead of houses in the shape of a pentagon. Identify a different geometric shape to help Ayşe and Ali. Express the rule between the number of toothpicks and the number of houses for houses made of the geometric shape you have determined".

77R: What do you think about this question?

78E: Since the geometric shape will change, the rule changes.

79R: Helin, can you tell me a geometric figure?

80H: Triangle.

81R: Okay, friends, let's create triangular houses with toothpicks.

82H: Helin creates triangular houses on the board.

83R: Well, Esra, create a house from a geometric shape.

84E: Esra builds square houses.

85R: Well, how many toothpicks do you need for Helin, 3 houses?

86H: *The rule for this is $2x+1$.* **DaR- D/SE-D**

87R: How did you find that?

88H: *Madam, when constructing houses from pentagons, it has 5 sides, but we found the rule as $4x+1$. In this one, if we substitute 1 for x in the rule to create 1 house, there are 3 toothpicks. He finds the toothpick numbers for the 2nd and 3rd houses.* **JR- D**

89R: Can we make a table about it?

90H: *Draws a rectangle on the board and splits it in half. It is written in the first column as the House number. It is written as the number of toothpicks in the second column. Then it refers to the toothpick numbers for the 1st, 2nd and 3rd houses. Writes the expression $2n+1$ for n houses.* **DR- D**

91R: Well, let's look at Esra square houses.

92E: Esra, our *general term here is $3x+1$. When we put it in its place, 4 for 1 house, 7 for 2 houses, 10 for 3 houses, ...* **DaR- D/SE-D**

93R: It's beautiful. So what is the relationship between the number of houses and the number of toothpicks?

94E: *We take 1 less the number of sides of the geometric shape of our house. Then we add 1.* **DC- D**

95H: No.

96E: *We take 1 minus the number of sides as a coefficient.* **JR- D**

97R: So beautiful...

Table 4: Findings Concerning Algebraic Thinking Habits of Students Regarding Toothpick Problem

Categori	Participants Features Name	Doing (D)		Undoing (UD)	
		Esra (frequency)	Helin (frequency)	Esra (frequency)	Helin (frequency)
	Organizing Information (OI)	1			

Building Rules to Represent Functions	Predicting Patterns (PP)				
	Chunking the Information (Ctl)	1			
	Different Representations (DR)		1		
	Describing a Rule (DaR)	3	3		
	Describing Change (DC)	2			
	Justifying a Rule (JR)	3	1		
Abstracting from Computation	Computational Shortcuts (CS)	2	2		
	Calculating Without Computing (CWC)	1	1		
	Generalizing Beyond Examples (GBE)				
	Equivalent Expressions (EE)	1	1	1	1
	Symbolic Expressions (SE)	1	1		
	Justifying Shortcuts (JS)	1			

When Table 4 is examined, a total of 26 codes were obtained for the doing habits of both students in the answers given by the students to the problems, while only 2 codes were obtained for the undoing habit. In the context of building rules to represent functions habit, 10 codes from Esra and 5 codes from Helin were obtained. Similarly, the category named describing a rule stands out in both students. In the context of Abstracting from computation habit, 7 codes were obtained from Esra and 6 codes from Helin. Thus, when the answers they gave to the problems in the context of building rules to represent functions and abstracting from computation habits are examined, it can be said that Esra has more habits than Helin.

4.2 Algebraic Habits of Students' Mind on the Equation Machine Problem

The answers given by Helin and Esra to the equation problem and their algebraic thinking habits were observed as follows:

OI-D

1H: Helin is reading part a of the problem. *If the number 4 is entered in machine A, the number that will be entered into machine B will be 12, since machine A has tripled it. (He expresses the operation " $4 \times 3 = 12$ " by writing on the board.)*

CS-D

2R: Esra, did Helin's action make sense?

3E: Yes. It made sense.

4R: Let's look at the other question, Helin.

5H: Helin is reading part b of the problem. Let's put the first number 7 in machine A. Then it comes out of machine A as $7 \times 3 = 21$. Then, machine B exits from machine B as $21 + 6 = 27$, *since machine B enters the number 21. Then if the number 12 enters machine A, $12 \times 3 = 36$, $36 + 6 = 42$.*

CS-D/EE-D

6R: When you enter 7, you say 26 comes out, when you enter 12, you say 42 subtracts. Esra, did Helin's action make sense?

7E: Yes.

8R: So when 100 enters machine A, how many will exit machine B?

CWC-D/GBE-D

9H: *When 100 enters machine A, my teacher (expresses it on the board and then expresses it as 500) 500.*

10R: Well, when the number n is entered, what is the output?

11H: (Writes on the board) $3n + 6$ **DaR-D**

12R: What is n?

13H: n is a number.

- 14R: So, it is the number we put in machine A. So what is the result?
- 15E: It is the number that comes out of machine B.
- 16R: Well, what number do we need to put in machine A to get 42 from machine B?
- 17H: *We solve the equation $3n+6=42$. $3n = 36$. So the number that comes out of the number A is 36. When we divide each by 3, we get $n=12$.* **EE-D/CS-UD**
- 18R: What is 12? Is it entering or exiting machine A?
- 19H: 12 is the inbound.
- 20R: Esra, did Helin's action make sense?
- 21E: Yes.
- 22H: Helin is reading part d of the problem.
- 23R: What is the relationship between the number entering machine A and the number leaving?
- 24H: *Equation is $3n+6$.* **SE-D**
- 25R: What does $3n+6$ mean?
- 26H: Sir, then we will do it as $3(n+2)$.
- 27R: Then tell me the rule, what should we say in the rule?
- 28H: *In the rule, we say that 2 more than n is 3 times.* **DaR-D D**
- 29R: How can we express this in terms of input and output from the machine?
- 30H: The number n is the number entering A. The result of this is the number from B.
- 31R: Well, can you describe it as in the question?
- 32H: Yes, sir. Multiply the number entering machine A by 3 and then adding 6 to get the number coming out of machine B.
- 33R: Esra, can you say the 3rd $(n+2)$ equation we created above in this way?
- 34E: *If we say n to the number entering machine A, I first add it by 2 and then multiply it by 3.* **DaR-D**
- 35R: Then we will multiply the resulting number by 3 in machine B?
- 36E: Yes.
- 37R: Did Helin make sense?
- 38H: Yes.
- 39R: Well, can you find a different working principle? Of course he will keep $3n+6$. If I multiply both sides of this expression by 2, both sides of the equation will not break, right?
- 40H: Helin writes the expression $2x(3n+6)=2x(3n+6)$ on the board.
- 41R: What is $3n+6$?
- 42H: is the input.
- 43R: Let's call this expression $2x(3n+6)$ the number coming out of machine B. What kind of expression is that as if it's a function isn't it?
- 44E: Esra shakes her head.
- 45R: Normally it was $3n+6$. This expression was equal to the number that came out of machine B. Can I give a letter to this expression even if I don't call it "the number coming out of machine B"?
- 46E: Esra shakes her head.
- 47H: *Let's say y* **SE-D**
- 48R: Now, if I multiply both sides of the equation by 2 in the expression $3n+6=y$, will the equality be broken?
- 49H: Helin writes the expression $2.(3n+6)=2.y$. **EE-D**
- 50R: Well, can you distribute 2?
- 51H: $6n+12=2y$.
- 52R: Well, can you express this verbally? What was our?
- 53E: It was the number that went into machine A.
- 54R: Well, what is y? How can we express this verbally?
- 55H: *12 more than 6 times the number entering machine A is equal to 2 times the output number.* **DaR-D**
- 56R: So how can we say that? Let's say the number that goes into machine A...
- 57E: I'll multiply by 6. I will add 12 to the resulting number. When I divide the resulting number by 2...
- 58R: We will have found the result, right?
- 59E: yes.
- 60R: Well, friends (showing the board) how can we show what we're doing here differently?
- 61H: We showed it here (pointing to the board).
- 62R: Different from this question, can you give a different representation of the rule you found?

63H: I can *draw a table*. (draws a table on the board) Draws a rectangle on the board and divides it in half. Writes in the first column as the number entering machine A. It writes in the second column as the number from machine B. Then it becomes 9 if he enters 1, 12 if he enters 2, and 15 if he enters 3. For the number n , it becomes $3n+6$.

64R: Did Esra make sense?

65E: Yes.

66R: Well, nice..

Table 5: Findings on Algebraic Thinking Habits of Students Regarding the Equation Machine Problem

		Doing (D)		Undoing (UD)	
Categories	Participants Features Name	Esra (frequency)	Helin (frequency)	Esra (frequency)	Helin (frequency)
Building Rules to Represent Functions	Organizing Information (OI)		1		
	Predicting Patterns (PP)				
	Chunking the Information (CtI)				
	Different Representations (DR)		1		
	Describing a Rule (DaR)	1	2		
	Describing Change (DC)				
	Justifying a Rule (JR)				
Abstracting from Computation	Computational Shortcuts (CS)		4		
	Calculating Without Computing (CWC)		1		
	Generalizing Beyond Examples (GBE)		1		
	Equivalent Expressions (EE)		4		
	Symbolic Expressions (SE)		1		
	Justifying Shortcuts (JS)				

When Table 5 is examined, a total of 16 codes were obtained for the doing habits of both students in the answers given by the students to the problems, while the code for the undoing habit could not be obtained. In the context of the building rules to represent functions habit, 1 code from Esra and 4 codes from Helin were obtained. In the context of Abstracting from computation habit, 11 codes were obtained from Helin, while it could not be coded from Esra. Thus, when the answers given to the problems in the context of building rules to represent functions and abstracting from computation habits are examined, it can be said that Helin has more habits than Esra.

5. Discussion and Conclusion

When examined in the context of Doing-Undoing habit, the problem solutions of both students were found very rarely. However, in the literature, Kieran, Pang, Schifter & Fong Ng (2016) stated that the habit of undoing in the Singapore education system is one of the thinking processes emphasized by the curriculum. For this reason, it can be said that problems and guidance questions should be included in the course process to help students gain this habit. In addition, it is possible to say that the acquisitions aimed at developing this habit should be increased in the mathematics curriculum.

When examined in the context of the habit of building rules to represent functions, it is seen that both students have a similar number of codes. Max & Welder (2020) concluded that the features in the subcategories of algebraic habits of the mind are interrelated. He stated that one of the related sub-categories is the describing change with predicting patterns. Similarly, in our study, it is seen that there is no finding about two characteristics of a student named Esra. Thus, it can be said that the predicting patterns in the habit of building rules to represent functions and the describing change features are similar to the findings obtained. In addition, it is seen that the habit of building rules to represent functions is frequently encountered when the answers given by the students to both problems regarding describing a rule are examined. Similarly, Magiera, Kieboom and Moyer (2017) and Max & Welder (2020) stated that pre-service teachers and students did not have any difficulties in describing a rule and determining the problems made in the context of the habit of building rules to represent functions. However, it is similar to the findings of the study, which they found insufficient to confirm and justify the rule.

When analyzed in the context of Abstracting from computation habit, when the answers given by both students to the problems were examined, the feature of computational shortcuts was frequently encountered. On the other hand, there was less finding about justifying shortcuts made by students. Similarly, Max & Welder (2020) justifying shortcuts stated that they should make generalizations about the operations performed to verify computational shortcuts. For this reason, in studies in the literature (Simon & Blume, 1996; Herbst & Chazan, 2011; Cai, Morris, Hohensee, Hwang, Robison, Cirillo, Kramer, Hiebert & Bakker; 2020) similar to the findings. In addition, when the answers given by the students to the problems in the context of the calculating without computing feature, which is included in the abstracting from computation habit, are examined, there is very little finding about calculating without computing. Rubenstein (2001) stated that students' use of calculating without computing feature facilitates their learning in many important structural subjects. In this respect, it is important to include guidance questions in the teaching process for the development of students' calculating without computing feature.

This research is limited to examining the problem solutions of only two 8th grade students regarding pattern and equation outcomes. In future studies, the use of guidance questions by teachers in teaching processes can be examined in the development of algebraic thinking habits of students at different grade levels. In addition, in-service training can be given to mathematics teachers on the use of guidance questions in teaching processes. In the teaching practices to be carried out to develop the algebraic habits of the mind of the students, the lesson introduction problems should be carefully prepared. Thus, the problems covered in the course should serve both to develop the algebraic habits of the mind of the students and to teach the relevant outcome.

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Notes

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The Effect of a Dialogic Reading Program on the Early Literacy Skills of Children in Preschool Period

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Abstract

The aim of this study is to examine the effect of an dialogic reading program on expressive language vocabulary and category naming skills, which are among the early literacy skills of preschool children. The research was designed in the quasi-experimental model, which is one of the quantitative research methods. The sample of the study consisted of a total of 30 children, 15 girls and 15 boys, between 64 and 72 months of age, who attended a kindergarten in Konya. Fifteen of the children were in the control group and 15 of them were in the experimental group. In addition to the existing preschool education program applied to the groups within the scope of the study, a 10-week dialogic reading program was applied to the experimental group. In the research, "Demographic Information Form" was used as the data collection tool and "Early Literacy Test (ELT)" was used as pre-test and post-test. According to the results of the research, the post-test scores of all groups' expressive language vocabulary and category naming skills increased significantly compared to the pre-test scores. However, the post-test scores of expressive language vocabulary and category naming skills of the experimental group were significantly higher than the control group. Accordingly, it was concluded that the dialogic reading program applied significantly increased the expressive language vocabulary and category naming skills, which are among the early literacy skills.

Keywords: Early Literacy, Dialogic Reading, Expressive Language Vocabulary, Category Naming

1. Introduction

According to Lerner (2000), early literacy is the acquainting of children to books, stories and poems at an early age. This skill encourages children to become acquainted with stories, books and early writing experiences at an early age. Whitehurst and Lonigan (2001) describe the early literacy process as a process in which the prerequisite skills that children should have before the formal literacy process are developed. There are different definitions of early literacy. These different definitions have a lot in common. These common elements form the basis of literacy and contribute "directly or indirectly" to the process of acquiring literacy (Doyle, 2009). Early literacy is a process that reveals the necessary prerequisites for children to read. Early literacy is all of the prerequisite knowledge, skills and attitudes that children are expected to acquire regarding literacy in the period before they start formal

literacy education in the early period. (Gupta, 2009). When all these definitions and expressions are evaluated, it is possible to say that early literacy skills are one of the main predictors of early reading skills (Kargin et al., 2017).

The development of literacy skills begins before the formal process of learning to read and write. Children form the basis for many literacy skills from birth. In the preschool period, children encounter stimuli that support their language development. This advancement in verbal language significantly supports the development of the child's reading and writing skills. In addition, the cognitive, social and emotional development of the child also provides important contributions to the literacy process. In this context, it can be said that literacy develops in a natural process and that experiences related to these skills from the first years of life will help children to be aware of early literacy (Erdoğan, 2013). enables them to acquire many of the skills that form the basis for literacy (Nelson, 2005; Kargin et al., 2017; Erdoğan, 2013).

Dialogic reading (DR) refers to a process in which the child's verbal language skills and vocabulary are aimed to be developed and adults and children read books interactively (Whitehurst et al., 1988; Whitehurst al., 1994; Whitehurst, Epstein et al., 1994). In DR, the child and the adult change their roles and with the guidance of the adult, the child learns to be the reader of the story. In this process, the adult assumes the roles of listening actively and asking questions to the child about the story. The children are asked questions about the events in the stories and opportunities are provided for them to talk about the book. Expands by identifying words that children may not know and repeating responses from the child. (Whitehurst, Arnold et al., 1994; Justice & Pullen, 2003).

When the results obtained from the studies on this subject are examined, it is seen that early literacy skills should be supported in the pre-school period and that these skills have an effect on academic success in the short and long term. Reading together with children at school and home environments by adults is most effective methods to support this skills. When researches in this regard are examined, it is observed that children who routinely participate in reading activities with an adult in the preschool period are more successful in language skills, especially in expressive language skills and vocabulary (Robbins & Ehri, 1994; Beck et al., 2002; Armbruster et al., 2003; Huebner & Payne, 2010; Greene & Lynch-Brown, 2002). It is suggested that activities that involve reading together create very effective contexts for children to learn new words and words that cannot be learned in a single reading are easily acquired by children through repeated reading of the books (Robbins & Ehri, 1994; Senechal & Cornell, 1993). Such results emphasize the importance of providing information infrastructure for dialogic reading and offering educational support to educators and families. In this context, the present study aims to investigate the effect of an dialogic reading program applied to preschool children on expressive language vocabulary and category naming skills, which are among the early literacy skills.

2. Method

In this study, the quasi-experimental model with a pre-test post-test control group, which is one of the quantitative research methods, was used in order to examine the effect of the dialogic reading program in the preschool period on children's early literacy skills, such as expressive language vocabulary and category naming sub-skills. Random assignment was not implemented in the selection of the experimental and control groups; since the current order of the school could not be changed, two equivalent classes were determined and groups were assigned.

2.1 Population and Sample

The population of the study consisted of children attending a public preschool education institution in Konya Meram district. The sample consisted of 30 children aged 64-72 months who attended the public school where the researcher worked. In order to conduct a more suitable experimental study with the participants, the children at the school where the researcher worked were included in the sample using the convenience sampling technique. 15 of the children were in the control group and 15 of them were in the experimental group.

Table 1: Distribution of the preschool children in the study by gender

Groups	Gender	f	%
Experimental	Girl	6	20,0

Control	Boy	9	30,0
	Girl	9	20,0
	Boy	6	30,0
Total		30	100

According to Table 1, 15 (50.0 %) children were girls and 15 (50.0 %) were boys. 6 girls (20.0%) and 9 boys (30.0%) were in the experimental group, and 9 boys (30.0%) 6 girls (20.0%) were in the control group.

Table 2: Distribution of the preschool children in the study by age

Groups	Age(months)	f	%
Experimental	64	2	6,67
	65	2	6,67
	66	2	6,67
	67	1	3,33
	69	2	6,67
	71	1	3,33
	72	5	16,67
Control	64	2	6,67
	65	1	3,33
	67	2	6,67
	68	1	3,33
	69	2	6,67
	70	3	10,00
	72	4	13,33
Total		30	100,0

According to Table 2, 4 (13.33 %) of the preschool children included in the study were 64 months old, 3 (10.0 %) 65 months old, 2 (6.67 %) 66 months old, 3 (10.0%) 67 months old, 1 (3.33 %) 68 months old, 4 (13.33 %) 69 months old, 3 (10.0 %) 70 months, 1 (3.33 %) 71 months old, and 9 (30.0 %) 72 months old.

2.2 Data Collection Tools

A demographic information form created by the researchers was used to collect information on the gender, age and number of siblings.

Within the scope of the study, Early Literacy Test (ELT) was applied to the experimental and control groups as pre-test and post-test. ELT consists of 7 subscales (Kargin et al., 2015). Expressive language vocabulary and category naming tests, which are subscales of ELT, were used in the study. The expressive language vocabulary subscale includes a sample item and 15 questions. In the category naming subscale, there is a sample item and 10 questions, and children are asked to say how the pictures shown to them are named in general. The upper and lower factor loads of the items in the expressive language vocabulary subscale were found to be .63 - .45, and the items in the category naming subscale were found to be .62-.43. In the correlation analysis performed with the Turkish Early Language Development Test for criterion validity, the correlation coefficient was calculated as .372 in the expressive language vocabulary subscale and .309 in the category naming subscale. The KR-20 coefficient calculated for the reliability of the expressive language vocabulary subscale was found to be .81, and the two-half test reliability was found to be .80. The KR-20 coefficient calculated for the reliability of the category naming subscale was .72, and the two-half test reliability was .70. The test-retest reliability coefficient of the scale was .89 in the expressive language vocabulary subscale and .68 in the category naming subscale.

2.3 Application Process

The dialogic reading program was planned as 10 weeks. It consisted of 3 sessions each week. It was a program consisting of 30 sessions in total. Prior to the program, the books to be used in DR were determined. It was ensured

that the books chosen were suitable for the 3-6 age group of preschool children and contained pictures that involved striking details, were conducive to the language production of the children as well as being clear and understandable. The selected books were presented to experts for their opinions and their opinions were taken. After the book selection, target words were determined for each book. Attention was paid to include words that children had not yet met, as well as words that children had just learned. During the sessions, the child was directed to the book by drawing attention to the character in the book, the characters in the book were introduced to the child, the target words in the books that were selected were supplemented with pictures, the target words were matched with the prepared pictures and repeated, 5WH questions (What, where, who, why, when and how) were used open-ended questions were asked, repetitions and expansions were performed, and activities such as completing sentences, predicting the end of the story, finding a title for the story, associating (connecting what happened in the story with what happened in the child's life), and producing a new ending were included.

2.4 Data Collection and Analysis

The Early Literacy Test (ELT) expressive language vocabulary and category naming subscales used in the study were administered to the control and experimental groups by the researcher as a pre-test before the application and as a post-test after the application. The information form created by the researcher, on the other hand, was filled by the families of the children. The collected data were arranged and analyzed with the help of SPSS program. According to the Kolmogorov-Smirnov normality test results of the data obtained from the scale, it was found that $p > .05$ and it was concluded that it showed a normal distribution. Accordingly, independent samples t-test and paired samples t test was used in the analysis of the data.

3. Results

The t-test results of the early literacy expressive language vocabulary pre-test scores of the children are given in Table-3.

Table 3: t-test results of early literacy expressive language vocabulary test pre-test scores

	N	\bar{X}	SD	t	p
Control	15	9.33	.90	-.757	.255
Experimental	15	9.67	1.45		

According to Table 3., the mean score of the early literacy expressive language vocabulary pre-test scores of the control group was calculated as 9.33, and the mean score of the experimental group was calculated as 9.67. According to independent samples t-test results ($t = -.757$; $p > .05$), there is no significant difference between the groups' early literacy expressive language vocabulary pre-test scores. Therefore, the groups can be considered equivalent in terms of early literacy expressive language vocabulary scores prior to the application.

Table 4: t-test results of category naming test pre-test scores

	N	\bar{X}	SD	t	p
Control	15	6.33	.82	-.902	.115
Experimental	15	6.67	1.18		

According to Table 4., the mean score of the early literacy category naming pre-test scores of the control group was calculated as 6.33, and the mean score of the experimental group was calculated as 6.67. According to the test results ($t = -.902$; $p > .05$), there is no significant difference between the groups' early literacy category naming pre-test scores. Therefore, the groups can be considered equivalent in terms of early literacy category naming scores prior to the application.

Table 5. t-test results of early literacy expressive language vocabulary of the control group

	N	\bar{X}	SD	t	p
Pre- test	15	9.33	.90	-3.292	.005
Post-test	15	10.13	1.06		

According to Table 5, the pre-test mean score of the early literacy expressive language vocabulary test score of the control group was calculated as 9.33, and the mean score of the post-test was calculated as 10.13. According to the test results ($t=-3.292$; $p<.05$), there is a significant increase of .80 points in the mean scores.

Table 6. t-test results of early literacy expressive language vocabulary of the experimental group

	N	\bar{X}	SD	t	p
Pre- test	15	9.67	1.45	-6.946	<.001
Post-test	15	12.73	1.75		

According to Table 6, the pre-test mean score of the early literacy expressive language vocabulary test score of the experimental group was calculated as 9.67, and the mean score of the post-test was calculated as 12.73. According to test results ($t=-6.946$; $p<.001$), there is a significant increase of 3.06 points in the mean scores in the experimental group.

Table 7. t-test results of early literacy category naming of the control group

	N	\bar{X}	SD	t	p
Pre-test	15	6.33	.82	-3.228	.006
Post-test	15	6.87	.83		

According to Table 7, the pre-test mean score of the early literacy category naming test score of the control group was calculated as 6.33, and the mean score of the post-test was calculated as 6.87. According to the test results ($t=-3.228$; $p<.05$), it is seen that there is a significant increase of .54 points in the mean scores.

Table 8. t-test results of early literacy category naming of the experimental group

	N	\bar{X}	SD	t	p
Pre-test	15	6.67	1.18	-9.260	<.001
Post-test	15	9.00	1.00		

According to Table 8, the pre-test mean score of the early literacy category naming test score of the experimental group was calculated as 6.67, and the mean score of the post-test was calculated as 9.00. According to the test results ($t=-9.260$; $p<.001$), there is a significant increase of 2.33 points in the mean in the experimental group.

Table 9: t-test results of early literacy expressive language vocabulary post-test

	N	\bar{X}	SD	t	p
Control	15	10.13	1.06	-4.919	<.001
Experimental	15	12.73	1.75		

According to Table 9., the mean score of the early literacy expressive language vocabulary post-test scores of the control group was calculated as 10.13, and the mean score of the experimental group was calculated as 12.73. According to the test results ($t=-4.919$; $p>.001$), it was concluded that the experimental group's early literacy expressive language vocabulary post-test mean score was 2.60 points higher than the control group, and this difference was statistically significant.

Table 10: t-test results of early literacy category naming post-test

	N	\bar{X}	SD	t	p
Control	15	6.87	.83	-6.346	<.001
Experimental	15	9.00	1.00		

According to Table 10., the mean score of the early literacy category naming post-test scores of the control group was calculated as 6.87, and the mean score of the experimental group was calculated as 9.00. According to the results ($t=-6.346$; $p>.001$), it was concluded that the experimental group's early literacy category naming post-test mean score was 2.13 points higher than the control group, and this difference was statistically significant.

4. Discussion

In this study, the effect of an dialogic reading program in the preschool period on children's expressive language vocabulary and category naming sub-skills, which are among early literacy skills, was examined. According to the research findings, it was found that the dialogic reading program contributed significantly to both expressive language skills and category naming skills of preschool children. When the pre-test scores of the children participating in the study obtained before the program and the post-test scores obtained after the program were evaluated, the result was seen to be in favor of the post-tests. Similarly, when the literature is examined, it has been found that dialogic reading supports children's early literacy skills (Pillinger & Wood, 2014; Lever & Senechal, 2011; Akoğlu et al., 2014; Wasik & Bond, 2001).

In their study, Akoğlu et al. (2014) aimed to examine the effects of dialogic reading practices on the receptive and expressive language skills of children in need of protection aged 4-5 years. The research consisted of pre-test, application and post-test stages. As a result of the research, it was observed that the post-test results of the Peabody Picture Vocabulary Test used in the evaluation of receptive language skills, and the average utterance length, the number of different words and the total number of utterances obtained from the natural language samples used for the evaluation of the quantitative measurements of expressive language skills were higher than the pretest scores.

Şimşek and Işıkoğlu Erdoğan (2015) conducted dialogic reading activities with 4-5 years old children from low-income families, twice a week for 4 weeks, and they found that the receptive and expressive language development of the children in the experimental group was higher than the children in the control group.

In an dialogic reading program that Robbins and Ehri (1994) conducted with 45 pre-school children in 1994, the same storybook was read twice with an interval of 2-4 days. They then applied a post-test to measure the meanings of the words whose meanings were also mentioned in the story. The children understood the words in the story better and were able to name the words, which showed that the dialogic reading program was effective in improving their vocabulary. More acquisitions were achieved in children with a larger vocabulary. Repeating words four times was necessary but not enough. According to the results of the research, it was determined that listening to stories improves the vocabulary of young children.

In a study they conducted, Wasik and Bond (2001) evaluated the effects of the dialogic reading technique on children's literacy and language development. While the teachers were reading to the children, the students were also allowed to use the words with the help of objects. Previously, teachers had been trained in asking questions and chatting about the book. Children enrolled in the interactive book-reading program scored higher on language tests than other children.

When the results of these studies and the results of the studies that have been reached are examined, and considering that language and early literacy skills form the basis of future literacy success, the importance of including dialogic reading practices in preschool education programs becomes even more evident. On the other hand, it is observed that scientific studies and field applications on this subject are still very limited in Turkey and teachers generally conduct reading activities in a way that includes very limited interaction. Apart from informal observations, there are no scientific studies examining how book reading activities are performed in pre-school education classes in our country. The studies in the relevant literature indicate that dialogic reading programs in early childhood contribute to the early literacy skills of children; therefore, it is important that the effectiveness of these programs be increased and that the effectiveness of these programs be tested repeatedly with different samples. In addition, according to these results, studies should be conducted to introduce and disseminate dialogic reading activities as good practice in pre-school education.

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Assessment of Health-Promoting Lifestyle Profiles and Nutritional Knowledge Levels of Pre-Service Physical Education and Science Teachers: A Comparative Study Example

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Abstract

The study aimed to examine pre-service physical education and science education teachers' health-promoting lifestyle profiles, nutrition habits, knowledge of nutrition levels, and their relationships with some demographic variables (gender, department, smoking, physical activity level). The study is a descriptive study conducted in a government university in Türkiye. The samples consisted of fourth-year pre-service physical teachers (N=37) and pre-service science teachers (N=32). Nutrition Habits Assessment Form, Health Promoting Lifestyle Profile II instrument (HPLP II), and Nutrition Knowledge Level for Adults Scale, which consisted of two parts, "Basic Nutrition Scale" and "Food Preference Scale," were used as data collection tools. Descriptive statistics and parametric tests analyzed data. Considering differences in the physical activity subscale between different departments, a significantly higher score was recorded among pre-service physical education teachers compared to pre-service science teachers. A significantly higher score was observed in the subscales on interpersonal relations and stress management and Basic Nutrition Scale Score among pre-service science teachers compared to pre-service physical education teachers. A significantly higher score was observed in the subscales on physical activity and interpersonal relations among male compared to female students. The HPLP II scores of the pre-service teachers, which exercised three times more than three times a week, were higher than those who exercised once a week and didn't exercise.

Keywords: Pre-Service Physical Education Teachers, Pre-Service Science Teachers, Health Promoting Lifestyle Profile, Nutrition Habits

1. Introduction

The health status of individuals affects their productivity and society's health (Özmen et al., 2007). The health status of individuals is affected by the physical, social, cultural, and economic environment in which they live. Today, the increasing prevalence of various diseases overwhelmed healthcare services worldwide (Glasgow & Schrecker, 2016; Kostova, Husain, Sugerman, Hong, Saraiya, & Keltz, 2017). Choo and Kang (2015) stated that

a health-promoting lifestyle is essential to disease prevention. Health-promoting lifestyle behaviors help to improve physical and mental health outcomes and decrease healthcare costs (Suda, Nakayama, & Morimoto, 2007; Aaby, Friis, Christensen, Rowlands, & Maindal, 2017; Mikkelsen, Stojanovska, Polenakovic, Bosevski, & Apostolopoulos, 2017). Healthy lifestyle behaviors are activities and efforts which help individuals stay healthy, become happier, prevent diseases, and increase the quality of their lives (Murray & Lopez, 2013). Individuals develop healthy nutrition habits, regular physical activity, health responsibility, and stress management for a healthy lifestyle. Changing some practices and creating new behaviors at older ages is difficult. For adults, it is very challenging to change their unhealthy behaviors. Therefore, developing healthy lifestyle behaviors at an early age is very important. Adolescence and the following youth period have a critical importance. In this context, schools and universities are appropriate settings for developing healthy lifestyle behaviors in adolescents and young people.

The university period is a period of significant changes in the lives of individuals. During this period, young students also experience physical, mental, and social changes. With the start of university life, many students leave their families and try to adapt to foreign living conditions. In this period, behaviors such as alcohol use, smoking, and unhealthy diet are increasingly observed (Werch et al., 2007). Healthy nutrition habits are one of the most critical health-promoting lifestyle behaviors. Nutrition plays a vital role in being healthy and maintaining health (Ahmad, Mohid-u-din & Qadir, 2018; Malkoç et al., 2020; Saroja & Priya, 2021). As mentioned above, it has been revealed in various studies that university students generally do not have healthy nutrition habits (Salama & Ismael, 2018; El-Ahmady & El-Wakeel, 2017; Abraham et al., 2018; Teleman et al., 2015; Gupta & Kochar, 2008; Driskell et al., 2005).

When the studies in the literature are examined, it has been observed that the healthy lifestyle profiles of university students, who generally study in health-related fields such as medicine and nursing, are reviewed concerning various variables (Mašina et al., 2017; Alzahrani et al., 2019; Safaile et al., 2020).). No studies were found in which the healthy lifestyle profiles of pre-service teachers were investigated. As future teachers, pre-service teachers will affect students' developing health-promoting lifestyle behaviors. Teachers need to have healthy lifestyle behaviors in terms of their health and be role models for their students. Various studies have stated that teachers are critical in shaping students' eating habits (Nanayakkara et al., 2018; Prelip, Erausquin, et al., 2006). Teachers can affect public health by indirectly involving students and families through their relationships with their students (Motamedrezaei et al., 2013). Therefore, within the scope of this study, healthy lifestyle profiles, nutrition habits, and basic nutrition knowledge levels of pre-service physical education and science teachers were investigated concerning various variables. It is thought that the findings of this study will provide information about the healthy lifestyle profiles of pre-service physical education and science teachers and will show whether the studied department causes a difference in the development of healthy lifestyle profiles of the pre-service teachers. Physical education and science teachers are responsible for teaching health-related subjects due to the course content of their branches. Therefore, examining the pre-service physical education and science teachers' health-promoting lifestyle profiles, nutrition habits, and nutritional knowledge levels in terms of various variables will help to identify the deficiencies of pre-service teachers and help develop various suggestions for eliminating these deficiencies.

2. The aim of the study

The study aims to examine health-promoting lifestyle profiles, nutritional habits, and nutritional knowledge levels of pre-service physical education and science teachers and compare the pre-service teachers in two different branches regarding the variables mentioned. Within the scope of the study it is aimed to seek answers to the following research questions:

- 1) What are the nutritional habits of pre-service physical education teachers?
- 2) What are the nutritional habits of pre-service science teachers?
- 3) Do the health-promoting lifestyle profiles of pre-service physical education teachers differ from the health-promoting lifestyle profiles of pre-service science teachers?
- 4) Do pre-service physical education teachers' nutrition knowledge levels differ from pre-service science teachers?
- 5) Do pre-service teachers' health-promoting lifestyle profiles and nutritional knowledge levels change according to gender?

- 6) Do pre-service teachers' health-promoting lifestyle profiles and nutritional knowledge levels change according to their smoking status?
- 7) Do pre-service teachers' health-promoting lifestyle profiles and nutritional knowledge levels change according to the frequency of weekly exercise?

3. Method

Within the scope of the study, health-promoting lifestyle profiles, nutritional habits, and nutritional knowledge levels of pre-service physical education and science teachers were examined, and the pre-service teachers from two different branches were compared in terms of the variables mentioned. For this purpose, descriptive study design, one of the quantitative research methods, was designed. Quantitative data were collected by applying the data collection tools given below. The nutrition Habits Assessment Form was used to determine the nutritional habits of pre-service teachers. The Health Promoting Lifestyle Profile II instrument was used to assess healthy lifestyle behaviors, and Nutrition Knowledge Level for Adults Scale was used to determine nutritional knowledge levels.

3.1 Data collection tools

3.1.1 Nutrition Habits Assessment Form

The form in the study of Ermiş et al. (2014) was used to prepare information about the nutritional habits of teacher candidates. The form includes the weekly frequency of exercise, smoking status, believing the importance of healthy nutrition, the most important meal, the reasons for skipping meals, and considerations in choosing meals. The form aimed to have information about the daily eating habits of teacher candidates. The answers given to the form were analyzed as percentage frequency.

3.1.2 Health Promoting Lifestyle Profile II instrument (HPLP II)

HPLP II developed by Walker and his friends (1996) and adapted to Turkish by Bahar and her friends (2008). The scale consists of 6 sub-dimensions and 52 items. The scale is a 5-point Likert type and does not contain negative items. The sub-dimensions of the scale are spiritual growth (6, 12, 18, 24, 30, 36, 42, 48, 52), health responsibility (item no 3, 9, 15, 21, 27, 33, 39, 45, 51), exercise. (item no 4, 10, 16, 22, 28, 34, 40, 46), nutrition (2, 8, 14, 20, 26, 32, 38, 44, 50), interpersonal support/relationships (1, 7, 13, 19, 25, 31, 37, 43, 49), and stress management (item no. 5, 11, 17, 23, 29, 35, 41, 47) (Yalçinkaya, Özer, & Karamanoğlu, 2007). The Cronbach Alpha internal consistency coefficient for the reliability of the scale was found to be 0.91 by Yalçinkaya, Özer, and Karamanoğlu (2007). In this study, the scale was applied to 127 pre-service teachers studying in science teaching and physical education teaching departments to calculate the reliability of the scale. Cronbach Alpha was calculated as 0.90 for the entire scale.

3.1.3 Nutrition Knowledge Level for Adults Scale

The Nutrition Knowledge for Adults Scale was developed by Batmaz (2018). The scale consists of two parts named the "Basic Nutrition Scale" (BNS) and the "Food Preference Scale" (FPS). The scores obtained from the nutrition knowledge level scale evaluation criteria for adults are evaluated as bad, moderate, sound, and very good. The highest score that can be obtained from the basic nutrition section is 80; The highest score that can be obtained from the food preference section is 48. Those with a basic nutrition scale score less than 45 are evaluated as poor, those with a score of 45-55 as moderate, those with a score of 56-65 as sound, and those with a score above 65 as very good. On the other hand, in the food preference scale score, the knowledge level of those below 30 is evaluated as bad, 30-36 points as medium, 37-42 points as good, and above 42 points as very good. The reliability coefficient Cronbach's Alpha for the BNS and FPS were found to be 0.71 and 0.70, respectively.

3.2 Data analysis

Percentage frequency analysis, independent samples t-test, and one-way ANOVA were used in data analysis. To

perform independent samples t-test and one-way ANOVA, the data should show a normal distribution (Büyüköztürk, 2018; p40). The results of the Kolmogorov-Smirnov test used to determine whether the data showed a normal distribution are given in the table below.

Table 1: Tests of Normality

	Kolmogorov-Smirnov(a)		
	Statistic	df	Sig.
HPLP II	0,08	69	0,20
BNS	0,08	69	0,20
NPS	0,10	69	0,05

According to the Kolmogorov-Smirnov test for all three scales, since $p > 0.05$, it was seen that the data showed normal distribution.

3.3 The samples

The sample of the study consists of physical education (N=37) and science teacher candidates (N=32) studying at a state university in the 2022-2023 academic year. The sample was determined by the criterion sampling method, one of the non-random sampling methods. In the Criterion sampling method, units meeting the specified criteria are included in the sample (Büyüköztürk et al., 2020, p94). Since the pre-service teachers' nutritional habits and nutritional knowledge levels will be examined within the scope of the study, the pre-service teachers who took nutrition courses were included in the study. Detailed information about the sample is given in Table 2.

Table 2: Distribution of the samples by department and gender

	Physical edu.		Science Edu.		Total	
	N	%	N	%	N	%
Female	20	54,1	27	84,4	47	68,1
Male	17	45,9	5	15,6	22	31,9
Total	37	100	32	100	69	100

4. Findings

The answers to the Nutritional habits Assessment Form are given in Table 3 as percentages.

Table 3: The % frequency values of the answers to the Nutrition Habits Assessment Form

	Department	Sci. Edu.	Phys. Edu.	Total
Weekly frequency of exercise	none	40,6	13,5	26,1
	Once a week	43,8	16,2	29,0
	2-3 times a week	12,5	51,4	33,3
	More than three times a week	3,1	18,9	11,6
Smoking status	Yes	9,4	27,0	18,8
	No	90,6	73,0	81,2
Believing the importance of healthy nutrition	Yes	93,8	97,3	95,7
	No	0,0	0,0	0,0
	Sometimes	6,3	2,7	4,3
The most important meal	Breakfast	40,6	62,2	52,2
	Lunch	0,0	8,1	4,3
	Dinner	59,4	29,7	43,5
Skipping meal	Yes	28,1	21,6	24,6
	No	12,5	27,0	20,3
	Sometimes	59,4	51,4	55,1

The most skipped meal	Breakfast	15,6	24,3	20,3
	Lunch	81,3	73,0	76,8
	Dinner	3,1	2,7	2,9
Reasons for skipping a meal	not being able to wake up	6,3	5,4	5,8
	lack of time	34,4	29,7	31,9
	being late for school	9,4	5,4	7,2
	No preparer	6,3	5,4	5,8
	dieting	0,0	2,7	1,4
	loss of appetite	43,8	40,5	42,0
	Economic reasons	0,0	10,8	5,8
Considerations while choosing a meal	Price	25,0	2,7	13,0
	satiety	6,3	18,9	13,0
	Favorite/desired food	50,0	43,2	46,4
	nutritiveness	15,6	32,4	24,6
	material quality	3,1	2,7	2,9

When Table 3 was analyzed, it was seen that there were differences between physical education and science teacher candidates in terms of the frequency of doing weekly exercise. 51,4 % of the physical education teacher candidates exercise 2-3 times a week and 18,9 % more than 3 times a week, whereas 12,5 % of science teacher candidates exercise 2-3 times a week and 3,1 % more than 3 times a week. While 40,6 % of science teacher candidates do not exercise at all, this rate in physical education teachers is 13,5 %.

While 27 % of physical education teacher candidates smoke, 9,4 % of science teacher candidates smoke.

More than 90 % of physical education and science teacher candidates believe in the importance of healthy nutrition. While 62,2 % of physical education teacher candidates and 40,6 % of science teacher candidates think that the most important meal is breakfast, 29,7 % of physical education teacher candidates and 59,4 % of science teacher candidates think that the most important meal is dinner.

24,3 % of physical education teacher candidates and 15,6 % of science teacher candidates expressed that they skip breakfast the most and 73 % of physical education teacher candidates and 81,3 % of science teacher candidates skip lunch.

29,7 % of physical education teacher candidates and 34,4 % of science teacher candidates expressed not being able to find time for skipping meals, 40,5 % of physical education teacher candidates and 43,8 % of science teacher candidates expressed not having an appetite as the reason. 10,8 % of physical education teacher candidates stated economic reasons for skipping meals.

While 43,2 % of physical education teacher candidates and 50 % of science teacher candidates expressed that their favorite meal is effective in choosing a meal, 32,4 % of physical education teacher candidates and 15,6 % of science teacher candidates stated that nutritious meals are effective in their choice. 25 % of science teacher candidates stated that price is effective in choosing a meal.

The HPLP II, HPLP II Subscales, BNS and FPS scores of physical education and science teacher candidates were compared with the independent samples t-test. The table below shows the results of the independent samples t-test of HPLP II, HPLP II Subscales, BNS and FPS scores in terms of department.

Table 4: Independent samples t-test results of HPLP II, HPLP II Sub-dimensions, BNS and FPS scores in terms of department

	Dep.	N	Mean	Std. Deviation	df	t	p
HPLP II	Sci.	32	139,34	16,89	67	1,28	0,20
	Phys. E.	37	133,81	18,58			

Spiritual growth	Sci.	32	29,09	3,43	67	1,63	0,10
	Phys. E.	37	27,70	3,60			
Health responsibility	Sci.	32	22,84	5,62	67	1,86	0,06
	Phys. E.	37	20,59	4,36			
Physical activity	Sci.	32	17,18	3,62	67	2,69	0,00
	Phys. E.	37	19,83	4,43			
Nutrition	Sci.	32	20,87	4,41	67	0,26	0,79
	Phys. E.	37	20,62	3,43		0,26	
Interpersonal relations	Sci.	32	27,78	3,61	67	2,32	0,02
	Phys. E.	37	25,37	4,92			
Stress management	Sci.	32	21,56	3,06	67	2,52	0,01
	Phys. E.	37	19,67	3,10			
BNS	Sci.	32	54,87	4,69	67	4,59	0,00
	Phys. E.	37	47,86	7,79			
FPS	Sci.	32	37,09	7,41	67	1,31	0,19
	Phys. E.	37	34,72	7,51			

When Table 4 was analyzed, it was seen that there was no statistically significant difference between physical education and science teacher candidates' HPLP II total, HPLP II subscales' spiritual growth, health responsibility, nutrition sub-dimensions and FPS scores in terms of department ($p>0,05$).

According to Table 4, there was a statistically significant difference in favor of physical education teacher candidates when physical education and science teacher candidates were compared in the HPLP II exercise sub-dimension ($p<0,05$). When physical education and science teacher candidates were compared in HPLP II interpersonal relations and stress management sub-dimensions, there was a statistically significant difference in favor of science teacher candidates. When physical education and science teacher candidates were compared, a significant difference was found in BNS scores in favor of science teacher candidates ($p<0,05$).

The scores of the teacher candidates from HPLP II, HPLP II sub-dimensions, BNS and FPS in terms of gender were compared with the independent samples t-test. The table below shows the results of the independent samples t-test of HPLP II, HPLP II Sub-dimensions, BNS and FPS scores in terms of gender.

Table 5: The results of the independent samples t-test of HPLP II, HPLP II Sub-dimensions, BNS and FPS scores in terms of gender.

	Gender	N	Mean	Std. Deviation	df	t	p
HPLP II	Male	22	142,40	17,57	67	1,95	0,05
	Female	47	133,55	17,52			
Spiritual growth	Male	22	29,27	3,32	67	1,48	0,14
	Female	47	27,91	3,63			
Health responsibility	Male	22	21,81	4,83	67	0,20	0,84
	Female	47	21,55	5,23			
Physical activity	Male	22	20,95	4,23	67	3,35	0,00
	Female	47	17,51	3,84			
Nutrition	Male	22	20,90	3,70	67	0,24	0,80
	Female	47	20,65	4,01			
Interpersonal relations	Male	22	28,04	4,04	67	2,00	0,04
	Female	47	25,76	4,56			
Stress management	Male	22	21,40	3,17	67	1,53	0,13
	Female	47	20,14	3,18			
BNS	Male	22	50,90	7,83	67	0,15	0,87

	Female	47	51,21	7,25			
FPS	Male	2	37,18	5,81	67	1,15	0,25
	Female	47	35,19	8,16			

When Table 5 was analyzed, a statistically significant difference was not found between physical education and science teacher candidates' HPLP II, all sub-dimensions with the exception of exercise and interpersonal relations of HPLP II, BNS and FPS scores in terms of gender ($p>0,05$). A statistically significant difference was found in teacher candidates' HPLP II exercise and interpersonal relations sub-dimensions in favor of male students ($p<0,05$).

The scores of the teacher candidates from HPLP II, HPLP II sub-dimensions, BNS and FPS in terms of smoking status were compared with the independent samples t-test. The table below shows the results of the independent samples t-test of HPLP II, HPLP II Sub-dimensions, BNS and FPS scores in terms of smoking status.

Table 6. The results of the independent samples t-test of HPLP II, HPLP II Sub-dimensions, BNS and FPS scores in terms of smoking status

	Smoking status	N	Mean	Std. Deviation	df	t	p
HPLP II	yes	13	134,23	17,22	67	0,47	0,63
	no	56	136,87	18,17			
Spiritual growth	yes	13	27,76	2,42	67	0,64	0,52
	no	56	28,48	3,79			
Health responsibility	yes	13	20,61	5,25	67	0,80	0,42
	no	56	21,87	5,05			
Physical activity	yes	13	19,53	4,44	67	0,87	0,38
	no	56	18,39	4,22			
Nutrition	yes	13	19,38	3,57	67	1,40	0,16
	no	56	21,05	3,92			
Interpersonal relations	yes	13	26,38	4,13	67	0,09	0,92
	no	56	26,51	4,62			
Stress management	yes	13	20,53	3,52	67	0,01	0,98
	no	56	20,55	3,16			
BNS	yes	13	48,84	7,23	67	1,23	0,22
	no	56	51,64	7,38			
FPS	yes	13	36,92	4,82	67	0,78	0,43
	no	56	35,57	8,01			

When Table 6 was analyzed, a statistically significant difference was not found between physical education and science teacher candidates' HPLP II, HPLP II Sub-dimensions, BNS and FPS scores in terms of smoking status ($p>0,05$).

The teacher candidates' HPLP II, HPLP II Sub-dimensions, BNS and FPS scores were compared with one way ANOVA in terms of the frequency of doing weekly exercise. The exercise sub-dimension of the analyzed HPLP II scale was not included. Variance homogeneity was tested with Levene Statistics. The Levene test was found as $p>0,05$ in all the scales and sub-dimensions included in the analysis. The table below shows the descriptive statistics of HPLP II, HPLP II Sub-dimensions (except for exercise), BNS and FPS scores in terms of the frequency of doing weekly exercise.

Table 7: The descriptive statistics of HPLP II, HPLP II Sub-dimensions (except for exercise), BNS and FPS scores in terms of the frequency of doing weekly exercise

		N	Mean	Std. Dev.
HPLP II	none	18	131,61	15,32
	Once a week	20	134,40	17,68
	2-3 times a week	23	135,82	18,71
	More than three times a week	8	153,62	13,56
Spiritual growth	none	18	27,33	4,89
	Once a week	20	28,15	2,49
	2-3 times a week	23	28,82	3,33
	More than three times a week	8	29,75	2,81
Health responsibility	none	18	21,27	5,24
	Once a week	20	21,65	5,50
	2-3 times a week	23	21,30	4,89
	More than three times a week	8	23,37	4,65
Nutrition	none	18	20,00	4,20
	Once a week	20	20,35	4,25
	2-3 times a week	23	20,86	3,50
	More than three times a week	8	23,00	2,92
Interpersonal relations	none	18	27,05	5,50
	Once a week	20	25,95	2,85
	2-3 times a week	23	25,65	4,87
	More than three times a week	8	29,00	3,92
Stress management	none	18	20,94	2,71
	Once a week	20	20,45	3,39
	2-3 times a week	23	19,60	3,38
	More than three times a week	8	22,62	2,61
BNS	none	18	51,94	7,18
	Once a week	20	52,25	5,81
	2-3 times a week	23	48,39	8,40
	More than three times a week	8	54,25	7,10
FPS	none	18	36,00	8,83
	Once a week	20	34,75	7,54
	2-3 times a week	23	34,56	6,31
	More than three times a week	8	41,75	5,44

Table 8: The ANOVA results of HPLP II, HPLP II Sub-dimensions (except for exercise), BNS and FPS scores in terms of the frequency of doing weekly exercise

		Sum of Squares	df	Mean Square	F	Sig.
HPLP II	Between Groups	2873,94	3	957,98	3,29	0,02
	Within Groups	18926,25	65	291,17		
	Total	21800,20	68			
Spiritual growth	Between Groups	40,29	3	13,43	1,05	0,37
	Within Groups	827,35	65	12,72		
	Total	867,65	68			
Health responsibility	Between Groups	29,03	3	9,67	0,36	0,77
	Within Groups	1722,90	65	26,50		
	Total	1751,94	68			
Nutrition	Between Groups	54,14	3	18,04	1,20	0,31

	Within Groups	975,15	65	15,00		
	Total	1029,30	68			
Interpersonal relations	Between Groups	78,13	3	26,04	1,30	0,28
	Within Groups	1301,11	65	20,01		
	Total	1379,24	68			
Stress management	Between Groups	57,82	3	19,27	1,94	0,13
	Within Groups	643,24	65	9,89		
	Total	701,07	68			
BNS	Between Groups	287,40	3	95,80	1,81	0,15
	Within Groups	3425,67	65	52,70		
	Total	3713,07	68			
NPS	Between Groups	341,01	3	113,67	2,11	0,10
	Within Groups	3492,90	65	53,73		
	Total	3833,91	68			

The one way ANOVA results showed that HPLP II scores displayed a statistically significant difference in terms of the frequency of doing weekly exercise. Tukey test was performed with the purpose of determining between which groups the difference occurred in terms of the frequency of doing weekly exercise. According to the results of the Tukey test, it was found that there was a statistically significant difference between those who do not exercise at all and those who exercise 3 times and more a week; those who exercise once a week and those who exercise 3 times a week and in favor of those exercise 3 times a week.

5. Results and Discussion

When teacher candidates' frequency of doing weekly exercise was analyzed, it was found that there were great differences between science and physical education teacher candidates. It was seen that physical education teacher candidates have a habit of regularly doing exercise, whereas a majority of science teacher candidates do not regularly exercise. It was seen that there is consistency between the answers given to the nutrition habits assessment form and HPLP II's exercise sub-dimension. The scores of physical education teacher candidates are higher compared to science teacher candidates in HPLP II's exercise sub-dimension as well. In the literature, it has been seen that students' behavior of regularly doing exercise changes in terms of their department when behavior of regularly doing exercise of university students from different departments were analyzed. For instance, in Ermiş, Doğan, Erilli and Satici's study (2014), it was found that there was a statistically significant difference between students in departments related to diet and health and students in other departments, in favor of students in health related departments in terms of the "regularly doing sports" and "smoking" variables. In the study mentioned, it was considered that the difference was due to having knowledge and awareness about health. In this study, it can be considered that the difference related to regularly doing sports is due to physical education teaching department is related to sports and that teacher candidates develop this behavior by the nature of this department. A majority of science teacher candidates do not exercise at all (40,6 %). The rate of those who exercise once a week is 48,8 %. This shows that science teacher candidates do not exercise. The acquisition of the habit of regularly doing exercise by young people is important in terms of leading a healthy life and preventing possible health related problems in the future. When it is considered that teacher candidates become role models for future students with their behaviors, acquiring the habit of regularly doing sports gains even more importance.

The rate of physical education teacher candidates who stated that they exercise 3 times and more a week and 2-3 times a week is about 70 %. This is an expected result since these students receive education in a department related to sports. However, when the findings were analyzed, it was seen that the rate of physical education teacher candidates who exercise once a week and those who do not exercise at all is about 30 %. This is a very high rate for teacher candidates who receive education in a department which is related to sports sciences. Physical education teacher candidates' not doing exercise regularly might have possible negative effects both on their health and their lessons.

When teacher candidates' smoking status was analyzed, it was seen that there is a great difference between physical education and science teacher candidates. While 27 % of physical education teacher candidates smoke, this rate is about 9 %. The finding that the rate of smoking in physical education teacher candidates who receive education in a sports related department and mostly have the habit of regularly doing exercise as stated above is higher compared to science teacher candidates is surprising. As indicated above, about 70 % of physical education teacher candidates regularly exercise. However, their rate of smoking is about 30 %. This reinforces the idea that the behavior of regularly doing exercise is formed by nature of the academic department, rather than a health related awareness.

These findings show that both physical education and science teacher candidates believe in the importance of nutrition. However, it is arguable to what extent they follow healthy diets in practice. A majority of the teacher candidates in both departments stated that they skip meals. When it was analyzed which meal physical education and science teacher candidates found the most important, breakfast and dinner came to the fore. The teacher candidates in both departments do not think that lunch is an important meal. As a result of this, it was observed that the most skipped meal by the teacher candidates of both departments is lunch. When it is considered that teacher candidates spend a majority of their time at school and start their classes at early hours in the morning, lunch should be an important meal for them. The findings indicate that students do not eat after breakfast until night time. When their ages and daily activity levels are taken into consideration, this is not healthy. When teacher candidates' reasons for skipping meals were analyzed, it was seen that there was no difference between the departments. The two reasons which came to the fore were not being able to find time and not having an appetite. While the reason of not being able to find time might be a reason for skipping breakfast, it might also be related to the fact that there is a long waiting time since cafeterias are crowded during lunch time. Therefore, the reasons for skipping meals can be analyzed in a more detailed manner. However, the rate of suggesting not having an appetite as a reason for skipping meals is quite high for both physical education and science teacher candidates. The teacher candidates are aged 22-23. Not having an appetite at these ages can have various reasons. The teacher candidates' not having an appetite can affect their health and general academic performance.

When the factors which influence choosing a meal for physical education and science teacher candidates were analyzed, it was seen that the teacher candidates in both groups prefer meals they like. The percentage of teacher candidates who prioritize nutrition is higher in physical education teacher candidates (about 30 % in physical education teacher candidates and about 15 % in science teacher candidates). It can be seen that although the teacher candidates in the study have lessons about nutrition, a majority of the teacher candidates do not prioritize nutritiousness of meals. This rate of is lower in science teacher candidates. When the teacher candidates knowledge levels on food preference and nutrition were analyzed, the findings are interesting. When the teacher candidates' BNS scores were analyzed, it was seen that both groups' knowledge level on nutrition was middle level. In addition, when the BNS scores of physical education and science teacher candidates were compared, it was found that the scores of science teachers were higher. Despite this finding, it was seen that the rate of prioritizing nutritiousness in choosing meals was lower in science teacher candidates. This finding shows that although the teacher candidates are knowledgeable about nutrition, they are insufficient in putting their knowledge to practice. This results indicates that the knowledge of the teacher candidates remains theoretical.

In the interpersonal relations and stress management sub-dimensions of HPLP II of physical education and science teacher candidates, the scores of science teacher candidates are higher compared to physical education teacher candidates. In this study, while there is no significant difference in the total scores of HPLP II in terms of gender, Akgün, Kostak et al.'s study (2014) has shown that female students' score in HPLP II is higher compared to male students. In the exercise and interpersonal relations sub-dimensions of HPLP II of the teacher candidates, it was seen that the scores of male teacher candidates were higher compared to the female teacher candidates. It was seen that female teacher candidates do not regularly exercise in daily life compared to the male teacher candidates. The possible reasons behind this should be analyzed. In addition, female teacher candidates' scores in the interpersonal relations sub-dimension, which is an indicator of individuals' interaction with their close environment, is lower compared to the male teacher candidates. Regular daily exercise behavior is extremely important for a healthy life. Additionally, an individual's relations with his/her close environment is important in terms of leading a healthy life. It was seen that the female teacher candidates were not as easy going as the male teacher candidates in their interpersonal relations, interactions and the support they receive. Similarly, there are studies in the literature which

analyze the differences in HPLP II and its sub-dimensions in terms of gender. Similarly, Alzahrani and others (2019) in their research showed that health-promoting profiles differed by gender, particularly with respect to physical activity and interpersonal relationships in favor of the males. Hacıhasanoğlu, Yıldırım, Karakurt, and Sağlam (2011) and Wei, Harada, Ueda, Fukumoto, Minamoto, and Ueda (2012) displayed that physical activity score average was higher in male students compared to female students. Additionally, Wei and his friends (2012) searched for the relationships of various demographic variables of Japanese university students with a health-promoting lifestyle profile. Their findings displayed that female students practiced significantly better health responsibility, interpersonal relations, and nutrition than males, and male students practiced significantly better physical activity than females. Wei et al.'s study (2012) has shown in support of this study in the exercise sub-dimension that males' rate of doing regular exercise is higher compared to females. However, as different from this study, it was shown that females' scores in interpersonal relations and nutrition were higher. Masina, Madzar, Musil and Milosevic (2017) examined gender differences among medical students and found that there was a significant difference between female and male students in favor of female students in the subscales of health responsibility and interpersonal relations. There was a significant difference between female and male students in favor of male students in the subscales of on physical activity and stress management. While Masina et al.'s study (2017) supports the findings of this study in terms of physical activity, it conflicts in terms of health responsibility and interpersonal relations categories. While there is no significant difference between the health responsibility and stress management scores of female and male teacher candidates in this study, Nassar and Shaheen (2014) and Mehri, Solhi, Garmaroudi, Nadrian, and Sigaladeh (2016) in their research have shown that health responsibility and stress management score averages of male students were higher than that of female students. When the difference in HPLP II and its sub-dimensions were analyzed in terms of gender, it was observed that there are different findings in the literature. In this respect, it is not possible to make a healthy interpretation about healthy life-style behaviors in terms of gender.

Th findings of the study show that the scores received from HPLP II in terms of the frequency of doing weekly exercise display differences. It was seen that the HPLP II scores of the teacher candidates who exercise three times and above a week were higher. Similarly, Akgün Kostak et al. (2014) have shown in their study that the HPLP II scores of individuals who regularly exercise is higher compared to those who do not regularly exercise. The behavior of regularly doing exercise has an important place in an individual's leading a healthy life. It is observed that individuals who regularly exercise are more successful in displaying healthy life-style behaviors.

6. Suggestions

It was seen that a majority of the science teacher candidates do not regularly exercise. The possible reasons behind this finding should be analyzed. The sports facilities of the faculty and university campus of the teacher candidates and to what extent students benefit from these facilities should be analyzed and whether there are problems related to lack of facilities or accessing these facilities should be determined. In addition, selective general culture lessons should be added to the science teaching program to encourage students to do sports and the teacher candidates should be encouraged to take these lessons.

The analysis of the relationship between physical education teacher candidates' doing regular exercise and their academic success and general health will help in identifying the general situation along with the other findings in this study. There is a need to analyze the reasons why physical education teacher candidates do not regularly exercise and its consequences and to reorganize the education process to allow teacher candidates to make exercise a part of their lives. Acquiring the habit of doing regular exercise will affect the success of physical education teachers in their professional lives as well.

It was seen that both physical education and science teacher candidates in particular skip lunch. It should be analyzed why lunch is skipped as a meal. The meal facilities and the conditions of cafeterias and whether the teacher candidates skip lunch due to these aspects (such as the small amount of meal choices, waiting in lines) should be analyzed. One of the reasons given for skipping a meal was not having an appetite. The teacher candidates' lack of appetite reasons and health conditions and whether it is caused by a health problem should be analyzed.

Although the teacher candidates are knowledgeable about nutrition, the fact that they ignore nutritiousness in their meal preferences requires the replanning of the content and learning activities related to nutrition. Activities which will allow students to implement their knowledge on nutrition to daily life should be planned to make it possible for knowledge to be used actively.

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Examination of Career Choice Competency from Self-Consciousness Level Perspective

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Abstract

This research aims to determine the relationship between university students' self-consciousness levels and their career choice competencies, to examine the predictive level of self-consciousness and career choice competency and to examine the level of self-consciousness and career choice competence based on education level and gender. The research was designed as a relational screening model, which is one of the descriptive survey types. The research group consists of undergraduate and associate degree students studying at various state universities in Turkey. The research group consists of a total of 569 university students, 398 of whom (69.9%) are female and 171 of whom (30.1%) are male, aged between 18 and 24. 268 (47.1%) associate and 301 (52.9%) undergraduate degree students participated in the research. The average age of the research group was 20.12. In the data collection process; the Self-consciousness Scale, Student Career Construction Inventory and Personal Information Form were used. According to the results of the correlation analysis; a low level of positive and significant relationship was found between the students' self-consciousness levels and career choice competencies ($r=.147$). According to the results of regression analysis; it was found that the level of self-consciousness predicts career choice competency at a statistically significant level. The findings obtained from this study were discussed based on the literature.

Keywords: Self-Consciousness, Self-Consciousness Level, Career Choice, Career Choice Competency

1. Introduction

People have to make some important decisions at certain periods in their lives, and such decisions have important roles in routing the direction and reshaping their lives. Career choice is considered one of these important decisions in individuals' lives. Career choice is an important responsibility and process to be fulfilled by each individual (Sevinç & Siyez, 2018). Career also refers to a combination of work-related experiences gained by individuals throughout their lives and a process that covers individuals' lives, and it is a phenomenon shaped by progress, regression and pauses throughout life (Kuzgun, 2006; Özyürek, 2013).

According to Super, a career is a series of events that structure individuals' lives. Individuals make various decisions and choices for their career development and structure their careers fulfilling their professional and other

roles considering their state (Yeşilyaprak, 2015). Career refers to a process created by individuals themselves, which is subsequently structured. Individuals need to have a profession and be active in life in society. Thus, individuals strengthen the connection between life and their profession, work and career. The performed work, profession and career process are the most important elements that form and define the identity of individuals (Yeşilyaprak, 2015).

Individuals have hidden innate powers, abilities and potentials. Individuals desire to use and reveal these characteristics in their lives. Having a profession and a job provides individuals with an opportunity to use these characteristics. Having a profession is an important tool for individuals to meet their psychological, physiological and social needs (Herr et al., 2004). Individuals make several decisions, and choices, and thus form their careers by continuing their professional roles in life considering their characteristics (Yeşilyaprak, 2015). Individuals build their career process by themselves. In addition, it is observed that many theories emphasize the importance of individual differences in career choice and development (Roe, 1965; Super, 1990; Tiedeman, 1961).

Career values, which are a self-concept consisting of the individual's perceived abilities and values, have an important impact on the individual's career choice. Many factors play a role in choosing a career. One of them is psychological factors, which include the values such as personality, abilities, interests and values. One of the personality traits associated with career and professional choice and career-related decisions of individuals is self-consciousness. Self-consciousness, which expresses the attention to different dimensions of an individual's self and the environment, plays a role in the behavior, thoughts and feelings of individuals (Akin et al., 2007). Self-consciousness, which is a key concept having an impact on behavior, is the level of attention and awareness of a person about himself and his environment (Wu and Watkins, 2006).

Individuals with a higher level of self-consciousness also have a higher level of self-confidence and satisfaction, and a higher level of self-control, and they are claimed to prevent unwanted actions (Comunian, 1994). These competencies also provide an opportunity for individuals to reconsider their actions and thoughts (Nie et al., 2014). It is estimated that the level of self-consciousness, which affects the control of individuals' thoughts, will also play an important role in making a career choice. Sari et al. (2017) conducted research and examined the relationship between self-transcendence, self-consciousness, self-control and self-management skills and found the relationship between variables was significant and positive (Sari et al., 2017).

It is stated that a high level of self-consciousness allows individuals to rethink their thoughts and actions (Dijkerman, 2015). This makes it less difficult for individuals to make decisions and choices. While some students make their career decisions easier, some students have difficulty in making such decisions (Albion and Fogarty 2002). Satisfaction felt after this decision, which significantly affects life, is also seen as a factor that affects individuals. The success achieved in career choice and satisfaction felt with the obtained result increases individuals' self-esteem, and subjective well-being and helps them feel greater career satisfaction (Kunnen et al., 2008). The satisfaction felt from the career choice is observed to affect individuals positively. Based on this, recruitment processes, professional development and in-service training programs are planned for employee candidates or employees considering their personality and psychological characteristics within the scope of human resources policies, and thus it can contribute positively to career satisfaction and change of work behaviors with structural and psychological empowerment (Cindiloğlu Demirer, 2020).

It has been stated that individuals with a higher level of self-consciousness have clearer self-knowledge and self-schema (Lindwall, 2004). Individuals with higher self-consciousness are considered to be more likely to take action in line with their personality characteristics. There is also a positive significant relationship between the level of self-consciousness and positive expectations regarding the future. There is a positive relationship between the level of self-consciousness and positive expectations about the future. It has been stated that general self-consciousness has a significant positive effect on personal success and competence. (Yurtkoru and Taştan, 2018). Sathapornvajana and Watanapa (2012) researched students studying at the department of computer programming and found that self-consciousness is also among the factors that affect the choice of profession.

This research aims to investigate the relationship between the Self-consciousness levels of university students and their competency in career choice. No research in the literature investigates the relationship between career choice

competency and Self-consciousness level. Since no similar research has been found in the literature the current research will contribute to the field. In this respect, it is thought that this study will contribute to career psychological counsellors, training managers and training planners, human resources specialists and managers facilitating the field applications. It is also considered valuable for researchers working in the relevant field and hoped that it will make an original contribution to the literature.

2. Method

This section presents details about the model of the research, the research group, the data collection tools, the data collection process and the analysis of the data.

2.1 Research Model

The research is structured as a relational screening model, which is one of the descriptive screening types. The relational screening model is a screening model that tries to explain the relationships between two or more variables and aims to examine the degree of change in variables together (Karasar, 2017). The variables of this research are the level of Self-consciousness and career choice competence.

2.2 Research Group

While determining the research group, a convenience sampling technique was used. The convenience Sampling Method is defined as a technique which allows researchers to start sampling with the respondent who can most easily be reached to have the required number of participants (Büyüköztürk et al., 2016). The universe of the research consists of university students studying at associate and undergraduate levels at various state universities. The research group consists of 569 university students aged between 18-24, 398 of whom (69.9%) are female and 171 of whom (30.1%) are male, studying at the associate and undergraduate levels.

2.3 Data Collection Tools

Data collection tools were administered to university students in the 2021-2022 academic year and online. The data were collected online by the researcher in a face-to-face environment. In the data collection process; the Self-consciousness Scale, Student Career Construction Inventory and Personal Information Form were used.

2.3.1 Personal Information Form

Prepared by the researcher and includes demographic variables such as gender, age, education level, income level, etc.

2.3.2 Self-consciousness Scale (SCS)

The adaptation studies of the scale developed by Mittal and Balasubramanian (1987) to Turkish were carried out by Akın et. al. (2007). The scale, which is in the form of a five-point rating, consists of 19 items. Confirmatory Factor Analysis (CFA) was used to test the validity of the scale. According to the results of CFA, compliance indices were found to be $\chi^2 = 330.91$, $sd = 140$, $CFI = .97$, $RMSEA = .047$, $RFI = .95$, $GFI = .95$, $NFI = .95$, $AGFI = .93$. The values obtained with the analysis are within the limits of compliance. Cronbach's alpha internal consistency coefficient was used to test the reliability of the scale. Cronbach's alpha internal consistency coefficient for the whole scale was found to be .81. The test-retest reliability coefficient of the scale was found to be .94. The increase in the score taken from the scale reveals that the level of Self-consciousness also increases.

2.3.3 Student Career Construction Inventory (SCCI)

The adaptation study of the scale developed by Savickas and Porfeli (2012) to Turkish was carried out by Sevinç and Siyez (2018). The scale, which consists of three dimensions "Discovery", "Identification", and "Readiness and Decision-making", has 18 items in total. The validity of the scale was tested with Confirmatory Factor Analysis.

According to the results of the analysis, goodness of fit indices were found to be $\chi^2 = 256.39$, $sd = 130$, $\chi^2/sd = 1.97$, $RMSEA = .056$, $RMR = .069$, $SRMR = .051$, $AGFI = .89$, $GFI = .092$. All these values are within acceptable limits. Cronbach's alpha internal consistency coefficient was used to test the reliability. Cronbach's alpha internal consistency coefficient for the whole scale was found to be .87. Cronbach alpha internal consistency coefficient for identification, discovery and readiness and decision-making sub-dimensions, respectively were found to be $\alpha = .65$, $\alpha = .72$ and $\alpha = .87$.

2.4 Analysis of Data

In the analysis of the data; an independent group t-test was used to determine whether the levels of Self-consciousness and career choice competencies differ based on gender and education level. Pearson correlation analysis was used to find out if there is a significant relationship between the variables. To determine the predictive power of the dependent variable of the independent variable, a simple linear regression analysis technique was used. Descriptive statistics were also used in the testing of the data. The data obtained from the participants were analyzed with the SPSS 17.00 program.

2.5 Ethical Issues

Ethical issues such as confidentiality and informed consent have been considered at the data collection stage. Ethical approval was obtained from Necmettin Erbakan University, Social and Human Sciences Scientific Research Ethics Committee with decision No. 2022/219 before the research was started.

3. Results

This section presents the findings regarding if university students' Self-consciousness and career competencies differed based on gender and education level; if there is a significant relationship between Self-consciousness and career choice and its degree if it exists; findings regarding the predictive power of Self-consciousness for career choice.

3.1 Comparison of Students' Self-consciousness Levels to Their Level of Education

The independent samples t-test analysis results, which were conducted to determine whether the total score and sub-dimensions score of Self-consciousness of the students participating in the research differed according to their level of education, are given in Table 1.

Table 1: Results of Independent samples t-test for the general scale score and sub-dimension scores of Self-consciousness based on the education level

	Education Level	N	\bar{X}	Ss	t	p
Self-reflectiveness	Associate Degree	268	2.92	.65	3.642	.000*
	Bachelor's Degree	301	2.72	.63		
Internal State Awareness	Associate Degree	268	3.16	.70	2.643	.008*
	Bachelor's Degree	301	3.00	.71		
Style Consciousness	Associate Degree	268	1.96	1.12	1.185	.24
	Bachelor's Degree	301	1.86	.99		
Appearance Consciousness	Associate Degree	268	3.17	.70	3.144	.002*
	Bachelor's Degree	301	2.98	.73		
Social Anxiety	Associate Degree	268	2.54	1.11	2.73	.007*
	Bachelor's Degree	301	2.30	1.02		
SCS Total	Associate Degree	268	2.73	.553	4.144	.000*
	Bachelor's Degree	301	2.55	.467		

When Table 1 is examined, students' self-reflexiveness ($p=.000$), internal state awareness ($p=.008$), appearance consciousness ($p=.002$), social anxiety ($p=.007$) and total self-consciousness ($p=.000$) dimension, there is a significant difference in favor of students studying at associate degree level. However, it was seen that there was no significant difference in the style consciousness of students ($p=.24$).

3.2 Comparison of Students' Career Choice Competencies to Their Education Level

The independent samples t-test analysis results, which were conducted to determine whether the general score and sub-dimensions scores of Self-consciousness of the students participating in the research differed according to their education level, are given in Table 2.

Table 2: Results of Independent samples t-test regarding the general score and sub-dimensions scores of Self-consciousness based on the education level

	Education Level	N	\bar{X}	Ss	t	p
Identification	Associate Degree	268	3.05	1.06	-1.614	.10
	Bachelor's Degree	301	3.18	.94		
Discovery	Associate Degree	268	3.09	1.21	-1.267	.21
	Bachelor's Degree	301	3.21	1.11		
Readiness and Decision Making	Associate Degree	268	3.15	1.19	-.250	.80
	Bachelor's Degree	301	3.17	1.00		
SCCI Total	Associate Degree	268	3.10	1.04	-.946	.35
	Bachelor's Degree	301	3.18	.90		

When Table 2 is examined, the scores of students in the dimensions of Identification ($p=.10$), Discovery ($p=.21$), Readiness and Decision-making ($p=.80$) and the general SCCI ($p=.35$) were found not to significantly differ based on the education level.

3.3 Comparison of Students' Self-consciousness Levels by Gender

Table 3: Results of Independent samples t-test regarding the general score and sub-dimensions scores of Self-consciousness based on gender

	Gender	N	\bar{X}	Ss	t	p
Self-reflectiveness	Female	398	2.84	.65	1.605	.11
	Male	171	2.75	.64		
Internal State Awareness	Female	398	3.09	.69	.652	.52
	Male	171	3.05	.74		
Style Consciousness	Female	398	1.95	1.06	1.436	.15
	Male	171	1.81	1.03		
Appearance Consciousness	Female	398	3.16	.68	4.311	.000*
	Male	171	2.88	.79		
Social Anxiety	Female	398	2.53	1.06	4.079	.000*
	Male	171	2.14	1.03		
SCI Total	Female	398	2.69	.50	3.964	.000*
	Male	171	2.51	.54		

When Table 3 is examined, there was a significant difference between the students' scores in the dimensions of Appearance Consciousness ($p=.000$), social anxiety ($p=.000$) and total Self-consciousness ($p=.000$) in favour of female students. However, there was no significant difference between the students' scores in the dimensions of Self-reflectiveness ($p=.11$), internal self-Awareness ($p=.52$) and Style Consciousness ($p=.24$) based on gender.

3.4 Comparison of Students' Career Selection Competencies by Gender

Table 4: Results of Independent samples t-test regarding the career choice competencies, the general score and sub-dimensions scores based on gender

	Gender	N	\bar{X}	Ss	t	p
Identification	Female	398	2.81	.98	-2.463	.01*
	Male	171	3.03	1.02		
Discovery	Female	398	2.78	1.18	-2.167	.03*
	Male	171	3.00	1.09		
Readiness and Decision making	Female	398	2.77	1.10	-2.301	.02*
	Male	171	3.00	1.06		
SCCI Total	Female	398	2.79	.96	-2.580	.01*
	Male	171	3.01	.97		

When Table 4 is examined, there was a significant difference between the students' scores in the dimensions of identification ($p=.01$), discovery ($p=.03$), readiness and decision-making ($p=.02$) and the total SCCI ($p=.01$) in favour of male students.

3.5 Correlation Analysis for the Relationship Between Students' Self-consciousness Levels and Career Choice Competencies

The findings obtained with the correlation analysis conducted to determine whether the relationship between the students' Self-consciousness levels and career choice is significant are presented in Table 5.

Table 5: Correlation analysis for the relationship between the students' Self-consciousness and career choice competencies

SCCI	SCI
r	.147
N	569

It was found with the correlation analysis that there was a low but significant positive relationship between the students' scores in the sub-dimensions of Self-consciousness and career choice competency ($r=.147$).

Correlation analysis was performed to test the existence and extent of a significant relationship between the sub-dimensions of Self-consciousness and career choice competency. The data obtained with the analysis are presented in Table 6.

Table 6: Correlation analysis for the relationship between the sub-dimensions of Self-consciousness and career choice competencies

Variables	1	2	3	4	5	6	7	8
SCI								
1. Self-reflectiveness	-	.43**	.31**	.34*	.30**	.01	.04	.06
2. Internal State Awareness		-	-.19**	.50**	-.14**	-.08	-.05	-.06
3. Style Consciousness			-	-.07	.58**	.18**	.17**	.19**
4. Appearance Consciousness				-	-.01	-.04	.03	-.02
5. Social Anxiety					-	.14**	.15**	.16**
SCCI								
6. Identification						-	.66**	.69**
7. Discovery							-	.73**
8. Readiness and Decision								-

Making

As seen in Table 6, no significant relationship was found between the Self-reflectiveness dimension of Self-consciousness scale and the sub-dimensions of Student Career Construction Inventory; Identification ($r=.01$), Discovery ($r=.04$), Readiness and Decision-Making ($r=.06$). There was also no significant relationship between the inner Self-consciousness dimension of the Self-consciousness scale and the sub-dimensions of student career construction inventory; Identification ($r=-.08$), Discovery ($r=-.05$), Readiness and Decision-Making ($r=-.06$). No significant difference was found between the Appearance Consciousness dimension of Self-consciousness scale and the subdimensions of the student career construction inventory; Identification ($r=-.04$), Discovery ($r=.03$), Readiness and Decision Making ($r=-.02$). There was a low level of significant and positive relationship between the social anxiety dimension of the Self-consciousness Scale and the subdimensions of student career construction inventory; Identification ($r=.14$, $p>.05$), Discovery ($r=.15$, $p>.05$), Readiness and Decision-Making ($r=.16$, $p>.05$).

3.6 The Effect of Students' Self-consciousness Levels on Career Choice Competency

The data obtained with the simple linear regression analysis conducted to determine the predictive power of the level of Self-consciousness in career choice competency are presented in Table 7.

Table 7: Regression analysis revealing the effect of the Self-consciousness level on career choice competence

Variable	B	β	t	p	R	R^2	F
Constant	2.127		10.180	.000			
Self-consciousness level	.276	.147	3.547	.000	.147	.022	12.578

When Table 7 was examined, it was found that the level of Self-consciousness predicted career choice competency at a statistically significant level. According to the obtained data, the Self-consciousness level of university students had a predictive power of 15% for career choice competency. The resulting value of $F=12.578$ reveals that the level of Self-consciousness significantly explained the career choice competency.

4. Discussion and Conclusion

This research aimed to determine the relationship between university students' Self-consciousness levels and career choice competencies, to examine the predictive level of Self-consciousness level for career choice competence and to examine career choice competency as well as Self-consciousness level based on gender and education level. This section discussed the findings obtained regarding the relationship between the Self-consciousness levels of university students and career choice competencies. The interpretation of the findings obtained from the research and their similarity with the literature have also been explained in this section.

According to the findings obtained from the research, there is a significant difference in favour of undergraduate students in the sub-dimensions of inner Self-consciousness and Appearance Consciousness; the total Self-consciousness and subdimensions (Self-reflectiveness and social anxiety) were found to be significantly different in favour of associate degree students. However, it was observed that there is no significant difference in the Style Consciousness dimension, which is one of the sub-dimensions of Self-consciousness. It is observed that there is no significant difference in the total score of the general scale and sub-dimensions of career choice competency (identification, discovery, readiness and decision-making) based on the education level.

It was observed that there is a significant difference in the general scale and sub-dimensions of Self-consciousness (Appearance Consciousness and social anxiety) in favour of female students. In many studies, it has been stated that the level of Self-consciousness of the female is higher compared to that of the male (Allgood-Merten et al., 1990; O'Connor, 1995; Rankin et al., 2004). However, it was observed that there is no difference in the dimensions of Self-reflectiveness, inner Self-consciousness and Style Consciousness based on gender. In some studies, no

difference has been found between Self-consciousness and gender (Goossens et al., 2002). The results of these studies support the findings of the current research.

It was observed that there is a significant difference in the general scale and sub-dimensions of career choice competence (identification, discovery, readiness and decision-making) in favour of male students. A study conducted with French adolescents found that parents have higher educational expectations of boys compared to girls, and therefore boys do more career research, learn more information, and thus can have more confidence in their ability to make career decisions (Vignoli et al., 2005). Gender has a regulatory effect on the self-competence of career decisions (Sovet and Metz 2014; Williams and Ciarrochi, 2020). The results of these studies support the findings of the current research.

There was a significant positive relationship between the students' Self-consciousness levels and their career choice competency. It has been observed that the students with a higher level of Self-consciousness also had a higher level of career choice competency. It is thought that individuals with a higher level of Self-consciousness will be able to reconsider their thoughts and actions, and having a higher level of awareness will ensure that their career selection competencies will also be high. The research conducted on the subject is limited. Sari et al. (2017) stated that there is a significant relationship between the expectation of professional outcomes and Self-consciousness. McCowan and Alston (1998) stated that students with higher Self-consciousness also have higher career-related decision-making competencies. The results of the studies support the findings of the current research.

There is no significant relationship between the sub-dimensions of Self-consciousness (Self-reflectiveness, inner Self-consciousness, Appearance Consciousness) and the sub-dimensions of career choice competence (identification, discovery, readiness and decision making). However, a significant positive relationship was found between the sub-dimensions of Style Consciousness and social anxiety and all sub-dimensions of career choice competency. Brown and Rector (2008) stated that there are many variables associated with career uncertainty (internal characteristics such as anxiety and psychological resilience), and anxiety is also considered among these variables. In addition, it has been stated that a higher level of social support facilitates career decision-making (Winderman et al., 2018). Since social anxiety is a problem that prevents an individual from being in a social environment, the individual remains uncommitted to receiving social support. Baltacı and Hamarta concluded in their research conducted in 2013 that there is a significant and negative relationship between social anxiety and social support. This means low perceived social support. When the results of such research are examined, the results obtained from the literature support the findings of the current research.

Another study was conducted by Sari et al. (2017) and found that the Self-consciousness levels of individuals explain the expectation regarding professional outcomes, which also supports the findings of this paper. On the other hand, McCowan and Altson (1998) concluded in their research that the level of Self-consciousness affected the career decision of university students. It could be said that the limited number of studies in the literature supports the results of this research.

When the findings obtained from the research are examined, there is a positive significant relationship between the level of Self-consciousness and career choice competency. It has been observed that Self-consciousness differed according to education level, but the career choice competency did not differ based on education level. In addition, it was observed that the level of Self-consciousness differed in favour of female students, while the career choice competency differed in favour of male students. There are articles in the literature with findings that gender perception significantly predicts career indecision (Demir, 2020). The fact that the current study was conducted in Turkey and the career choice proficiency of women is lower than that of men can be considered as an indication that results in line with the literature have been achieved. Self-consciousness was also found to be an important predictor of career choice competency.

When the literature was examined, there was no research examining career choice competency from the Self-consciousness level perspective. The fact that the relationship between career choice competency and Self-consciousness level has been addressed for the first time in this study is considered valuable specifically for psychological counsellors and guides, career psychological counsellors, human resource professionals, researchers

in the field and human resource policymakers. It is considered that this study will play a guiding role for those having difficulty with their career choice, career uncertainty and career planning, educators, advisory teachers, psychological counsellors, career advisors and field experts in the field.

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Pre-service Teachers' Views on the Process of Designing Activities through Cartoons

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Abstract

Cartoons are an effective alternative to create a rich learning environment that is visually and audibly equipped for students in an effective science education. It is of utmost significant for science teachers to possess the necessary knowledge, activity experience and equipment in order to carry out a qualified science teaching. Therefore, the pre-service science teachers, who will be trained in the specified direction, should hold a certain level of knowledge, skills and experience in preparing and implementing activities. In this regard, this study aims at revealing the pre-service science teachers' views on the process of designing activities through using cartoons. The study was carried out with 14 fourth grade pre-service science teachers studying at a state university in Turkey. The cartoon that the pre-service teachers were requested to use to design in-class activities during the implementation was determined as "Ege and Gaga" on the "TRT Child" channel. That this cartoon is related to education and science and includes science subjects has been effective in its selection. This study employed a case study design, one of the qualitative research methods, and the data were collected through a semi-structured interview form. Content analysis was used during data analysis. The results suggested that no pre-service teachers had encountered an activity prepared through using cartoons before. The participants also had positive views on the activity design process such as effective, interesting, enjoyable, concretizing knowledge and alternative technique. These activities, which are appropriate for the teaching and traditional classroom environments, are expected to enable students to access knowledge more easily with pleasure, and thus contributing to learning.

Keywords: Pre-service science teachers, Cartoons, Preparing an Activity, View

1. Introduction

Science is considered as a remarkable field in contributing to the development of societies by making life easier. Therefore, a science teacher should endeavour to improve himself in conjunction with current curricula as well as social and scientific developments. The need to prepare and implement new and engaging activities in the lessons particularly in line with technological developments prompts teachers to think in a multi-dimensional way. A teacher mediating to create an effective learning environment concentrates on attracting students' attention and interest through using all available opportunities and materials (Gökçe, 2002). On that point, the teacher should carry out in-class teaching by preparing the appropriate activity. Sullivan, et al. (2009) implicated that teachers should have the necessary knowledge and equipment in order to pose activities effectively that require higher-level process skills such as reasoning and association. Hence, pre-service science teachers are expected to improve themselves in accord with social and technological advances in the educational process.

Undoubtedly, education faculties hold the most important task in teacher training. It is of upmost significance for instructors to provide an environment for students to prepare and test the activities that they can use in their professional lives. In this regard, pre-service science teachers are supposed to produce original ideas that adapt to today's conditions as well as products from these ideas depending on environment and conditions. Besides, they need to have the 21st century skills along with problem-solving skills (Kendaloğlu, 2021). Pre-service teachers who will be trained in this direction should also have a certain level of knowledge, skills and experience in preparing and implementing activities (Özgen & Alkan, 2014) so as to be beneficial for students to develop cognitively (Okumuş, 2021).

“While choosing learning-teaching and evaluation activities in science lessons, great attention should be paid so that individuals can gain the behaviours identified in the learning outcomes through discovery by using scientific process skills such as questioning, gathering information, observing, and interpreting data.” (MoNE, 2005). In this respect, it is of great importance to prepare activities that are appropriate for the accepted learning approach, model and the learning objectives within the scope of the course (Üçüncü et al., 2016). Waldrup et al. (2010) revealed a strong relation among students' meaning-making processes in science lesson activities. Similar studies suggested that activity-based teaching contributes positively to students' academic achievement, cooperation and problem-solving skills and attitudes towards the course (Barai, 2018; Batdı, 2014; Bozkurt & Kuran, 2016; Büyükbayraktar Ersoy & Dilber, 2016; Hussain et al., 2011; Koohang et al., 2009; Kyriazis et al., 2009; Lakshmi & Hee, 2005; Okoro, 2019; Shah & Rahat, 2014).

In an effective science education, cartoons are considered as one of the best alternatives to create a rich and visually equipped learning environment for students. A visual communication tool, the main objective of the cartoon is to simplify the complex and visualize the invisible as well as providing an effective teaching. Thus, it is absolutely based on a message. Cartoons use a more humorous and pleasant language for the needs of the target audience when conveying the message (Güler, 1989). Providing that cartoons are prepared by considering children's ages and developmental characteristics, supporting their multidimensional development and by consulting the pedagogues' views and suggestions, they can be used for education in addition to entertainment.

Numerous studies conducted in recent years concluded that cartoons are used as teaching materials in different disciplines and welcomed as an educational material in education (Borzekowski, 2018; Kanellidou & Zacharia, 2019; Vitasmo, et al., 2020). Cartoons, which are regarded as an effective and useful tool that provide better understanding by visualizing (Barak et al., 2011), contribute to teachers showing more concepts in less time (Banchonhattakit et al., 2015; Chan, 2015). Upon analyzing the relevant literature, there is a dearth of studies conducted on the use of cartoons in the education process (Awadh et al., 2014; Bieri et al., 2013; Dalacosta et al., 2009; Indradat et al., 2014; Sohn et al., 2013; Berber et al., 2019; Çelik, 2015; Aytekin, 2020; Yener et al., 2021; Yurt & Ömeroğlu, 2013). Ayvaci et al. (2012) implied that the use of cartoons in science education increases children's achievement scores. Likewise, Yurt and Ömeroğlu (2013) emphasized that cartoons provide support for students to learn science subjects. Besides, studies carried out with teachers and pre-service teachers concluded that cartoons are useful and inspirational in teaching (Bayındır, 2015; Berber et al., 2019; Özeskici, 2014; Sancak, 2018).

Considering the studies conducted with pre-service teachers, there is no such a study specifically published on designing an activity through using cartoons. Thus, this study is paramount in terms of addressing further studies. Aiming at examining the views of the pre-service science teachers on the process of designing activities using cartoons, the present study is also substantial in terms of providing pre-service science teachers with acquiring knowledge and skills during the process of designing activities through integrating cartoons with the content of science concepts into the lessons. In a similar vein, this study is expected to shed light onto revealing the pre-service science teachers' views regarding the activity preparation process.

1.1 Aim of the Study

This study sought to examine the pre-service science teachers' views on the process of designing activities through using cartoons.

Hence, the research question is; What are the pre-service science teachers' views on the process of designing activities through using cartoons?

2. Method

This study employed a case study design, one of the qualitative research methods. The study analysed the cases related to the situation with a holistic approach and identified how they were affected by the situation (Yıldırım & Şimşek, 2008). The case study is the study of understanding the activity within all its circumstances and providing in-depth information regarding the activity (Merriam, 1998). Thus, this study deployed the case study design since the pre-service science teachers' views on the process of designing activities through using cartoons were examined.

2.1 Working Group

Qualitative research is usually conducted in-depth on purposefully selected relatively small samples (Patton, 2002). The working group of this study consisted of the 4th grade pre-service science teachers (14) studying at a state university in Turkey. The participants were chosen by convenience sampling, which is a purposive sampling method. Because this sampling method selects a situation that is close and easily available by giving the researcher practicality and speed (Yıldırım & Şimşek, 2008). The working group held senior pre-service science teachers as the knowledge, skills and experiences related to preparing and implementing activities in the research are thought to be at a certain level. Besides, the volunteering principle was taken into consideration when determining the working group and the names of the pre-service teachers, 4 of whom were males and 10 females, were kept confidential, and hence they were named with codes as PT1, PT2, PT3...

2.2 Data Collection Tools

The present study deployed a semi-structured interview form to reveal the pre-service science teachers' views on the activity design process. The cartoon that the pre-service teachers were requested to use to design in-class activities during the implementation was determined as "Ege and Gaga" on the "TRT Child (Turkish Radio and Television Corporation Child, 2022)" channel. "Ege and Gaga" is an entertaining cartoon that conveys questioning and the pursuit of knowledge to children in a gripping style. In addition, "Ege and Gaga" includes science subjects and concepts, arouses interest in science; moreover, it is thought to be beneficial for developing children's creativity. This cartoon was preferred by the researcher since it was related to education and science, and included science subjects. The cartoon episodes used in the implementation process were determined via the "TRT Child" channel's website (<https://www.trtcocuk.net.tr/>). The semi-structured interview form used for the cartoon activity design process was prepared by analysing the relevant literature and consulting two science education experts. The interview questions were administered to 7 pre-service science teachers, apart from the working group, to ensure that the questions were clear and understandable. Necessary corrections were made after receiving the same experts' views and the form got its final version. The semi-structured interview form consists of 8 open-ended questions.

2.3 Data Analysis

Content analysis was used during data analysis. Content analysis is a process that begins with data collection and ends with category and code extraction, and that the interpretation and synthesis of data are conducted by researchers (McMillan & Schumacher, 2006). All interviews were conducted via a voice recorder with the permission of the participants. The records were converted into text by the researcher. Afterwards, codes were created; similar codes were brought together, categorized and presented in tables. In content analysis, similar data are brought together within the framework of certain concepts and themes, and they are arranged and interpreted in a way that the reader can understand (Yıldırım & Şimşek, 2008). While creating the codes and categories, correct and reliable findings were obtained by consulting a science education expert who was not included in the research process. Besides, the validity was ensured with direct quotations to reflect the views of the pre-service teachers.

2.4 Implementation Process

The episodes of the cartoon "Ege and Gaga" on TRT Child channel were initially watched and examined by the researcher until the end. The episodes in the cartoon were identified across the grade level and learning outcomes. Two science teachers and a science education expert were consulted when determining the grade level and learning outcomes of the cartoon content. Of all the selected cartoons, four cartoons at different grade levels were chosen by taking the views of a science teacher and a science education expert into consideration. The pre-service teachers were informed about the research process and the implementation was conducted with volunteers. The implementation lasted approximately five lesson hours. At the first meeting, volunteer pre-service teachers were informed about the considerations they should pay attention to in the process of designing cartoon activities with some examples of the activities in the relevant literature and textbooks. Afterwards, the cartoons at each grade level were presented to the pre-service teachers to design activities. Thus, each pre-service teacher was ensured to choose the cartoons for the activity by himself or herself. Table 1 depicts information regarding the grade level, subject area and learning outcomes of the cartoons determined by the researcher with the support of field experts.

Table 1: Science learning outcome contents of cartoon episodes

Cartoon Episode	Grade Level	Subject Area	Unit	Learning outcome	Internet Address
93rd episode: Shadow Play	5th grade	Physical Phenomena	Scattering of Light	F.5.5.4.1. The student demonstrates with simple ray drawings by observing how the full shadow is formed.	https://www.trtcocuk.net.tr/video/ege-ile-gaga-93
62nd episode: Is it tasteless?	6th grade	Living Beings and Life	Systems in Our Body	F.6.6.2.2. The student demonstrates the relationship between the senses of smell and taste with an experiment s/he designed.	https://www.trtcocuk.net.tr/video/ege-ile-gaga-62
46th episode: Black and White	7th grade	Physical Phenomena	Interaction of Light with Matter	F.7.5.1.1. The student discovers that light can be absorbed by matter as a result of its interaction with matter.	https://www.trtcocuk.net.tr/video/ege-ile-gaga-46
82nd episode: Land of the Clouds	8th grade	Earth and the Universe	Seasons and Climate	F.8.1.2.1. The student explains the difference between climate and weather events.	https://www.trtcocuk.net.tr/video/ege-ile-gaga-82

Upon analysing Table 1, the "Shadow Play" episode of the outcome content in the "Physical Events" subject area "Scattering of Light" unit was used for the 5th grade, and "Is it tasteless?" episode "Living Beings and Life" subject area, the "Systems in Our Body" unit for the 6th grade, the "Black and White" episode of the outcome content in the "Physical Phenomena" unit of the "Interaction of Light with Matter" for the 7th grade and "Land of the Clouds"

episode of the outcome content in the “Seasons and Climate” unit of the “Earth and the Universe” subject area for the 8th grade. The researcher examined the activities designed in the second meeting with the pre-service teachers. Missing and badly organized activities were determined and necessary feedbacks were presented, and finally, the pre-service teachers were asked to finalize their activities. At the last meeting, the cartoon activities prepared by the pre-service teachers were presented in the classroom environment to get their colleagues’ views. Some of the cartoon activity examples prepared by pre-service science teachers are shown in the Appendix.

3. Results

This section presents the data related to the pre-service science teachers’ views regarding the process of designing activities through using cartoon.

3.1 Findings regarding the pre-service science teachers’ views on the process of designing activities through using cartoons

A semi-structured interview form prepared by the researcher was used to reveal the pre-service science teachers’ views on the process of designing the cartoon activity. Considering the findings related to the question “Have you encountered any lesson activities prepared through using cartoons before? If your answer is “Yes”, give an example.”, none of the pre-service teachers were determined to experience such an activity.

Table 2 depicts the findings related to the question “How would you evaluate the implementation of designing an activity through using cartoons?”

Category	Code	<i>f</i>
Positive	Effective	9
	Interesting	6
	Enjoyable	5
	The process of concretizing knowledge	4
	Alternative technique	3
Negative	Takes a long time to prepare	1

Table 2 displays that the pre-service teachers had both positive and negative views towards the activity design process. Accordingly, they were noted to use positive expressions such as effective ($f=9$), interesting ($f=6$), enjoyable ($f=5$), the process of concretizing knowledge ($f=4$) and alternative technique ($f=3$) with regard to activity design process. Besides, a pre-service teacher had a negative view on the activity design process as it took a long time. Some of the pre-service teachers’ views are as following:

PT14 “It would be a very effective implementation for students.”

PT3 “I believe that we can make education more fun by using it within educational process.”

PT3 “It took me a long time to prepare the questions I would ask while preparing the cartoon lesson activity, and the implementation took a long time.”

Table 3 summarizes findings related to the question in the semi-structured interview form, “What would you like to say if you evaluate yourself during the activity design process?”.

Category	Code	<i>f</i>
Positive	I did not have much difficulty	7
	I discovered new things	3
	I have had experience	2
	Do research	2

	I learned my shortcomings	2
Negative	Time-consuming	1

As in Table 3, when pre-service teachers evaluated themselves in the activity design process, they had such views as I did not have much difficulty ($f=7$), I discovered new things ($f=3$), I learned my shortcomings ($f=2$), I did research ($f=2$), I have had experience ($f=2$). In addition, a pre-service teacher expressed a negative view by stating that the process of designing an activity is time-consuming. Some of the pre-service teachers' views are presented as follows:

PT8: "I did not have much difficulty in the process of designing an activity; on the contrary, I prepared it with pleasure. I was very motivated while watching cartoons and preparing activities since the process attracted my attention just as students and I discovered new things."

PT10: "I thought about how I could teach the most effectively and most meaningfully, or how I could ask attention-grabbing questions during the process of designing an activity. I may be a little incompetent in preparing comprehensive and creative questions. However, I had a lot of fun while preparing it and I gladly did it."

The findings related to the question in the semi-structured interview form, "What is the contribution of the process of designing activities through using cartoons to you? Please explain." are depicted in Table 4.

Table 4: The contribution of cartoon activity design process to the pre-service teachers

Category	Code	f
Positive	Enriching the lesson	7
	Designing new things	7
	Using cartoons in the lesson	6
	Doing research	4
	Writing questions for revealing the skill	4
	Visualizing the lesson	3
	Preparing level-appropriate questions	2
	Associating daily events with the lesson	2

As is seen in Table 4, the pre-service teachers had positive views regarding the contributions of the cartoon activity design process. Hence, the emerging codes were identified as enriching the lesson ($f=7$), designing new things ($f=7$), using cartoons in the lesson ($f=6$), doing research ($f=4$), writing questions for revealing the skill ($f=4$), visualizing the lesson ($f=3$) and associating daily events with the lesson ($f=2$). Here are some excerpts from the pre-service teachers' views:

PT2: "I learned to design new things by enriching the course. I was impressed that cartoons could also be used in lessons."

PT6: "This process made me gain experience in preparing comprehensive and level-appropriate questions to develop skills."

Table 5 highlights the findings regarding the question "What kind of learning environment do you think will be created when the cartoon activity you have prepared is implemented? Why?"

Table 5: Pre-service teachers' views on the cartoon activity implementation learning environment

Category	Code	f
Positive	Effective learning environment	9
	Learning with fun	2
	Permanence	1
	Active participation	1
	Increasing interest in the lesson	1
	Engaging	1

According to Table 5, given that all the pre-service teachers used the cartoon activities they had prepared, they were found to express positive views about the learning environment. In this regard, the codes were determined as effective learning environment ($f=9$), fun learning ($f=2$), engaging ($f=1$), permanence ($f=1$), active participation ($f=1$) and interest in the lesson ($f=1$). Some of the pre-service teachers' views on the learning environment are as following:

PT10: "I assume it will be an effective learning environment as learning will be effective and fun for the teaching environment."

PT3: "I think an effective environment will be created. It will ensure students' active participation in the lesson. Students' interest and attention in the lesson will increase thanks to cartoons."

Table 6 presents the findings related to the participants' responses to the question, "What are the considerations you pay attention to while designing the activity? Explain with reasons."

Table 6: The pre-service teachers' views regarding the considerations they paid attention to while designing a cartoon activity

Category	Code	f
Student	Grade-appropriate	7
	Revealing prior knowledge	5
	Getting student attention	3
	Active student	2
Purpose	Appropriate for learning outcomes	5
	Revealing misconceptions	3
	Using time efficiently	1
	Increasing retention	1
The structure of the activity	Asking questions in appropriate time	3
	Suitability for daily life	3
	Questions revealing skills	2
	Questions are clear	2
	Intriguing questions	2
	Query	2
	Visual layout	1

Upon analysing the pre-service teachers' views on the considerations, they paid attention to while designing the activity, they were found to mostly emphasize the student, purpose and structure of the activity. The pre-service teachers were determined to design the activity by considering the student factor at the most level. This was followed by grade-appropriate ($f=7$), revealing the prior knowledge ($f=5$), getting the students' attention ($f=3$) and active student ($f=2$). When the purpose category, one of the considerations that pre-service teachers paid attention to while designing the activity, was examined, the emerging codes were appropriate for learning outcomes ($f=5$), revealing misconceptions ($f=3$), efficient use of time ($f=1$) and increasing retention ($f=1$). Finally yet importantly, some codes related to the structure of the activity were determined as being suitable for daily life ($f=3$), asking questions in appropriate time ($f=3$), being inquisitive ($f=2$), questions revealing skills ($f=2$), clarity of questions ($f=2$), intriguing questions ($f=2$) and visual layout ($f=1$). Some of the pre-service teachers' views on that point are presented as such:

PT14: "The consideration I mostly paid attention to was the purpose. In other words, "What do I aim to transfer with this activity?" Then, I made sure that it was appropriate for the student. (Student's readiness, grade level, psychomotor skills, affective, cognitive skills...)"

PT3: "The most important point I paid attention to was the questions I would ask the students. Because I needed to attract the students' attention in the questions I was going to ask, and I tried to pay attention to the questions I would ask in order to ask complex questions."

Table 7 demonstrates the findings with regard to the question in the semi-structured interview form, “Which skills do you think the students will gain when the activity you have designed is implemented?”

Table 7: Pre-service teachers' views on the skills that students will gain when the activity they have designed is implemented

Category	Code	<i>f</i>
Scientific Process Skills	Predicting	7
	Observing	6
	Questioning	4
	Testing the data	3
	Designing an experiment	3
	Changing variables	2
	Hypothesizing	2
	Drawing conclusion	2
	Inferencing	1
	Interpreting data	1
Life Skills	Analytical thinking	3
	Creative thinking	2
	Decision making	1
21 st Century Skills	Critical Thinking	3
	Problem solving	3
	Digital literacy	1
	Interdisciplinary association	1

On analysing Table 7, the pre-service teachers' views on the skills that students would acquire when the activity they had designed was implemented were categorized as scientific process skills, life skills and 21st century skills. Accordingly, the emerging codes in relation to science process skills included making predictions ($f=7$), making observations ($f=6$), questioning ($f=4$), testing data ($f=3$), designing experiments ($f=3$), changing variables ($f=2$), hypothesizing ($f=2$), drawing conclusions ($f=2$), interpreting the data ($f=1$) and making inferences ($f=1$). When examining the pre-service teachers' views on life skills, they were found to emphasize that analytical thinking ($f=3$), creative thinking ($f=2$) and decision-making ($f=1$) skills were those that students would gain when the activity is implemented. As for the 21st century skills category, the pre-service teachers noted problem solving ($f=3$), critical thinking ($f=3$), interdisciplinary association ($f=1$) and digital literacy ($f=1$) skills. Some of the pre-service teachers' views are as following:

PT2: “I think it will provide skills such as research, questioning, making predictions, designing experiments, reasoning, engineering design skills, making hypotheses, making observations, correlational thinking, changing variables, making decisions and making inferences.”

PT10: “I think that students can gain problem-solving skills, research skills, questioning skills, decision-making and reasoning skills as well as critical thinking skills.”

Table 8 shows the findings on the question “Did you have any difficulties while designing activities through use of cartoons? Please explain.”

Table 8: Pre-service teachers' views regarding the difficulties they have experienced in designing activities through cartoons

Category	Code	<i>f</i>
Yes	Preparing questions suitable for the content	5
	Preparing questions for developing skills	3
	Determining the learning outcome	3
	Dividing cartoons into episodes	2
	Content preparation	2
	Grade level	1

No	I haven't had difficulty	3
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According to Table 8, 11 of the pre-service teachers had difficulties in the process of designing the activity. In this context, the emerging codes were preparing questions appropriate for the content ($f=5$), determining the learning outcome ($f=3$), preparing a question revealing skills ($f=3$), dividing the cartoon into episodes ($f=2$), preparing the content ($f=2$) and grade level ($f=1$). On the other, three pre-service teachers implicated that they had no difficulty in the process of designing the activity. Some of the pre-service teachers' views are presented below:

PT9: "I had some difficulty in choosing the right scenes in order to achieve my aim in the activity that I prepared through using cartoons. Since the learning outcomes were related to each other, I had some difficulty in determining which learning outcome the cartoon would be most suitable. Afterwards, I had to ask the most appropriate questions in the episodes I chose. It was a bit of a challenge to ask the right question in line with my goals on the subject."

PT5: "I was able to do the activity comfortably without any difficulty."

The findings related to the question "Do you consider preparing an activity by using cartoons in your teaching life? Why?" are suggested in Table 9.

Table 9: The pre-service teachers' views on preparing cartoon activity

Category	Code	f
Yes	Interest in the lesson	5
	Increasing students' motivation	5
	Permanence	4
	Fun learning	4
	Engaging	3
	Active learning environment	2
	Effective learning	2
	Revealing prior knowledge	1
	Research-inquiry	1
	Exploring	1
	Designing	1
	Science process skills	1
	21st century skills	1
	Achieving the learning goal	1
	Learning with differences	1
	Efficient learning	1
	Meaningful learning	1
	Technology-aided	1
No	Waste of time	1
	Student participation	1

As in Table 9, 13 of the pre-service teachers stated that they would prepare a cartoon activity when they became teachers. In this regard, increasing the interest in the lesson ($f=5$), increasing the students' motivation ($f=5$), ensuring the permanence ($f=4$), creating a fun learning environment ($f=4$), attracting the students' attention ($f=3$) and creating an active learning environment ($f=2$) were identified as the emerging codes with regard to preparing cartoon activity. Only one of the pre-service teachers indicated that s/he would not use the cartoon activity as it was time consuming and could not ensure student participation. Some of the pre-service teachers' views are as such:

PT5: *"Yes, I think that it will increase the interest and motivation towards the course as it provides a platform that offers students a multimedia as a course material. I consider that it can be more efficient in conveying knowledge, especially in abstract concepts."*

PT12: *"I do not think because it will cause a lot of waste of time, and I doubt that each student will fully participate."*

4. Discussion

This study is an attempt to examine the pre-service science teachers' views on the process of designing activities through using cartoons. The episodes of the cartoon "Ege and Gaga", which were broadcast on TRT Child, with science content at different grade levels determined by the researcher, were presented to the pre-service teachers. These episodes are "Shadow Theatre" for Grade 5, "Is it Tasteless?" for Grade 6, The "Black and White" for the 7th Grade and the "The Land of the Clouds " for the 8th Grade. The pre-service science teachers were requested to design an activity by choosing one of these cartoons. Afterwards, a semi-structured interview form was deployed to reveal their views on the process of designing the activity through cartoons.

All of the pre-service teachers implied that they had not encountered an activity prepared using cartoons before. The results suggested that the pre-service teachers had positive views on the activity design process such as effective, interesting, enjoyable, process of concretizing knowledge and alternative technique; moreover, some negative views also emerged related to the fact that the design took a long time. Upon analysing the relevant literature, some studies suggested that cartoons can be used during education as they are interesting and engaging (Bayındır, 2015; Özskici, 2014; Sancak, 2018). In addition, the literature shows that cartoons urge students to discover new concepts, provide possible answers to daily life questions and participate in classroom discourse, as well as increasing their motivation for learning science (Barak et al., 2011). Dalacosta et al. (2009) concluded that cartoons are quite effective in helping children form some basic science concepts such as weight, mass, and gravity.

The results also demonstrated that the pre-service science teachers had positive views on the contribution of the cartoon activity design process. In this vein, they highlighted some points such as enriching the lesson, designing new things and integrating cartoons into the lessons. When pre-service teachers evaluated themselves during the activity design process, they were determined to have positive views as such: I didn't have much difficulty, I discovered new things, I learned my shortcomings, I did research, I have had experience. The emerging codes related to the implementation of the cartoon activities prepared by all the pre-service teachers were identified as effective learning environment, fun, remarkable, permanence, active participation and interest in the lesson. In the study conducted by Berber et al. (2019), the pre-service teachers stated that fun learning environments will be created and the lessons will be conducted in an entertaining way with the use of cartoons in science lessons. Besides, similar studies indicated that children's imagination will develop with cartoons, that they will enjoy the teaching process, and that their desire to learn will increase (Aşçı, 2006).

The pre-service teachers were noted to mostly prepare the cartoon activity by considering the students, the purpose and the structure of the activity. Scientific process skills, life skills and 21st century skills were found when the pre-service teachers' views on the skills that the students would acquire when the activity they had prepared was implemented. 11 of the pre-service teachers had difficulty in preparing questions suitable for the content, determining the learning outcome, preparing questions that reveal skills, dividing the cartoon into episodes, preparing content, grade-level during the process of designing the activity. 13 of the pre-service teachers confirmed that they would prepare a cartoon activity to increase interest in the lesson, student motivation and permanence when they became teachers. Koçak and Göktaş (2021) concluded that educational cartoons provide more permanent learning in concept teaching compared to traditional methods. Ayvaci et al. (2012) noted that the use of cartoons in science education increases children's achievement scores. Numerous studies demonstrated that the use of cartoons as teaching materials has a positive effect on achievement (Aytan & Tunçel, 2015; Çelik, 2015; Ekinci, 2017; Oruç & Teymuroğlu, 2016). Besides, visual branches such as cartoons and animation easily attract children's attention and have the task of educating as well as entertaining (Aşçı, 2006; Kaba, 1992).

5. Suggestions

Based on the research findings, various recommendations were provided:

- Applied training should be provided for the development of the pre-service teachers' knowledge and skills in designing activities.
- The pre-service science teachers who encountered cartoon activity design for the first time were identified to have difficulty in preparing questions suitable for the content of the cartoon. Therefore, they should have the opportunity to do such activities more often during their educational process.
- Pre-service teachers may be recommended to prepare activities through using different cartoons appropriate for science content.
- Pre-service teachers may be encouraged to prepare activities in the Teaching Practice course to gain experience in the cartoon activity preparation process.
- Research may be conducted on identifying and eliminating the difficulties of the pre-service science teachers in designing cartoon activities.
- The relevant literature may be enriched by conducting similar studies.

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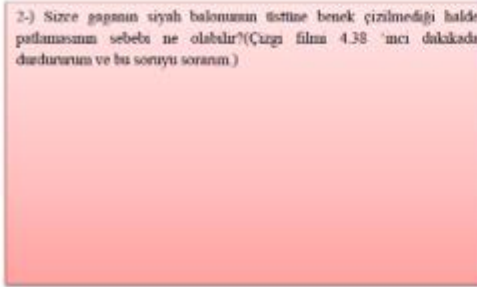
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Appendix: Examples of activities prepared by pre-service science teachers

Seçtiğim çizgi film	https://www.trtcocuk.net.tr/video/egge-ile-gaga-46
Ders Adı	Fen Bilimleri
Sınıf	7.Sınıf
Ünite Adı / No	Işık Madde İle Etkileşimi/ 5
Konu Adı	Işık soğurulması
Kazanım	F.7.5.1.1. Işık madde ile etkileşimi sonucunda madde tarafından soğurulabileceğini keşfeder.

ETKİNLİK KAGIDI

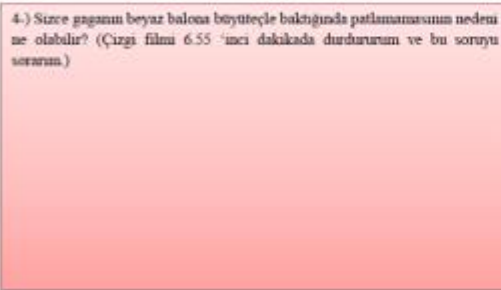
1-) Sizce gaganın mavimsi balonunun benekli çizimden önce patlamayıp da, çizirken patlamasının nedeni ne olabilir? (3.35 'inci dakikada durdururum ve bu soruyu sorarım.)



2-) Sizce gaganın siyah balonunun üstüne benek çizilmediği halde patlamasının sebebi ne olabilir?(Çizgi filmi 4.38 'inci dakikada durdururum ve bu soruyu sorarım.)



3-) Sizce gaganın beyaz balonunun şişirildikten sonra hemen patlamayıp da, siyah balonunun hemen patlamasının sebebi ne olabilir? (Çizgi filmi 6.51 'inci dakikada durdururum ve bu soruyu sorarım.)



4-) Sizce gaganın beyaz balona büyüteçle bakıldığında patlamammasının nedeni ne olabilir? (Çizgi filmi 6.55 'inci dakikada durdururum ve bu soruyu sorarım.)



ETKİNLİK PLANI

Etkinliğin Adı: Ege ile Gaga - Tatsız mı?

Ders: Fen Bilimleri

Ünite/Konu: Vücudumuzdaki Sistemler ve Sağlığı/ Duyu Organları

Kazanım: F.6.6.2.2. Koku alma ve tat alma duyuları arasındaki ilişkiyi, tasarladığı bir deneyle gösterir.

Öğrenci Becerileri: Tahmin Etme, Muhakeme Becerisi, Problem Çözme Becerisi , Gözlem yapma Becerisi

Çizgi film linki: <https://www.trtcocuk.net.tr/video/ege-ile-gaga-62>

- Bağlantıda verilen Ege ile Gaga çizgi filmi izletilir. Ve aşağıda verilen sürelerde video durdurulur ve sürelerin karşısındaki sorular sorulur.



01:47- Geçmiş yıllarda duyu organlarını ve özelliklerini öğrenmişsiniz. Peki o bilgilerden yola çıkarak meyve tabağındaki meyveleri gözlemleyelim. Meyve tabağında; erik, çilek ve kiraz bulunmaktadır. Peki bu meyve tabağında hangi meyvelerin bulunduğunu, gözleriniz bağlı iken hiçbir güçlük çekmeden söyleyebilir misiniz?

Cevabınız “evet” ise hangi duyu organınızı kullanarak bunu yaparsınız ? Açıklayınız. (Bu soru ile öğrenciler hem önceki bilgileri ile bağlantı kuracak hem de yeni bir sorunu ile karşılaştıkları için öğrencilerin dikkati çekilmiş olacak?)



01:06- Çevremizdeki kokuları algılamamızın önemi konusunda neler söyleyebilirsiniz? (Bu soru ile öğrencilerin; kendini ifade etme ve bilgisini yorumlama becerisi gelişmektedir)

Improvisation Strategies in Online Drama Lesson

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Abstract

In drama lessons based on improvisation and role playing, participants express themselves spontaneously, take on various roles and act out by pretending. With improvisation, which is one of the two basic strategies used together with role playing in drama, the participants act in accordance with the designed dramatic fiction. The goal of this research is to determine opinions of the participants about the improvisations performed in online drama lessons. It was attempted in this context to show the influence of participants and instructors on improvisation by determining which strategies were employed throughout the online drama lesson. In this study, interpretative qualitative research design was used and the experiences of the participants were tried to be explored, made comprehensible and interpreted. Participants consist of 21 undergraduate students studying in different departments who attended online drama lessons at Ankara University in 2021-2022 academic year. Participants answered the questions in the "*Assessment Form for Improvisations in Digital Platform*" online. The data obtained in the research were analyzed with the descriptive analysis, and the findings were explained in accordance with the determined themes and categories. The results showed that the participants used some strategies before and during the improvisation, and these strategies made improvisations more qualified. Participants also stated that while improvising on the digital platform, some situations have positive or negative effects, and they try to adapt themselves according to these situations. The research also reveals that the films watched and the topics discussed during lessons facilitate the participants to take roles while improvising, and the examples given about the elements of drama contribute to the improvisation. According to the results, it is recommended to inform the participants before the improvisations in online drama lesson, to create the dramatic fiction with the participants and to make the improvisations in accordance with this dramatic fiction. The elements of drama may be discussed, short films and feature-length films can be shown, examples can be offered, and improvisations can be made more qualified throughout the drama lesson.

Keywords: Online Drama Lesson, Improvisation, Digital Platform, Improvisation Strategies, Improvisation in Online Drama Lesson

1. Introduction

With Covid-19 process, many lessons have started to be taught on digital platforms. One of these lessons is drama. In drama lessons based on improvisation, role-playing, the participants express themselves spontaneously, take on various roles and by pretending (Adıgüzel, 2021). One of the basic strategies used in drama lessons is improvisation, which in its simplest definition means play without a script (Way, 1967). Participants take on various roles and improvise using these strategies. In drama lessons, a dramatic fiction is designed by the drama

teacher, the participants act in accordance with this dramatic fiction: They ask various questions in or out of the role, and they make various discoveries by following these questions. In this way, improvisation acts as a research tool, a magnifying glass or a lens in the hands of the participants and the drama teacher. Participants take this artistic magnifying glass in their hands and begin to examine different situations, human relations. In this research process, they try to explore various attitudes and reactions, feelings and thoughts. Participants who improvise begin to learn and discover more than they know in this process. Because improvisation is not just an artistic style or acting strategy. Beyond these, it is an independent and transformative way of being and doing something that dynamically penetrates many layers of the person performing the improvisation (Frost and Yarrow, 1989). As such, improvisation can be defined as a comprehensive inquiry, research and discovery process regarding human experience.

Improvisation is not only a strategy applied together with role playing in traditionally accepted mainstream applications of drama, but also an educational and artistic tool that should be used effectively in classrooms (Hornbrook, 1989). From the birth of theater in ancient Greece and the mimesis as a way of understanding human nature, the elements of popular theater of the Commedia dell'Arte and the aesthetic refinement generated by the rigors of French classicism, to the spectacular experimental forms of the twentieth century and its integration as a pedagogical method, improvisation has always accompanied theater, as a revelation of playfulness and freedom of creative expression, based on study and continuous training (Hristu, 2020). Especially with the 20th century, improvisation has become the main tool for creating experimental art forms, especially in the fields of music and dance, by going beyond the boundaries of theatrical art (Frost ve Yarrow, 1998). It can be said that such studies emerged in the 1960s when postmodernism as a cultural phenomenon opened up for discussion the relationship of "truth, language with thought and the world, reason with science and technology, human nature with the self, the individual with the group, power with the oppressed, and aesthetics with creativity" (Cited from Linn, 1996; Slovic, 2020). There is a consensus that a participatory approach, in which the audience is invited to an increasing number of artworks since the 1960s, has emerged, and that this understanding dominates artistic production and exhibition (Stott, 2015). Participation in the arts has emerged in literature as well as theater, dance and music. The famous literary critic Roland Barthes introduced the concept of "scriptable text" as a text that demands the reader's contribution for its completion. This kind of relationship that the reader establishes with the text requires the active cooperation of the reader with the text, the reader becoming a producer of the text rather than a consumer. The concept of scriptable text put forward by Barthes corresponds to the concept of "process" in drama as a new dramatic form (Haseman, 1991). Dorothy Heathcote (Wagner, 1999) also emphasizes problem solving rather than emphasizing plot and character development, as in the conventional form of drama in the dramatic arts. The purpose of drama studies is not to "make a theater" or "to perform" in the conventional sense; It is to understand a historical event on a fictional plane and through improvisation, to discover the world of a novel, to experience the conflict between different cultural groups, to gain information about how the other sees the world by making use of the possibilities of the art used. In this context, it can be stated that drama, which is a teaching method as well as an artistic form, is applied with a production approach adopted by new art forms, as it opens the traditional teacher-student, conventional theater-interactive performance dichotomies to discussion, similar to the dichotomies opened for discussion with postmodernism. The educational and artistic foundations of drama should be sought in its process-oriented nature, which brings with it "ambiguity". Because group members, who move from a starting point in a certain target focus, are not fully aware of what they will encounter in the next stages of the process. In the later stages, the ambiguity, which is the source of the "productive tension", which Heathcote (1991) defines as "leaving to chance something that cannot be completely controlled in the drama process" and that binds the group members to the process, is tried to be clarified with improvisations. The main reason for this ambiguity and the tension it creates is the absence of a completely written text in the drama processes. Therefore, improvisation, which has a long tradition, stands out as a technique that should be included in drama studies as well as forming the basis of them (Haseman, 1991). If we compare improvisation to a way, the improvisation in the drama lesson are both the elements that contribute to the progress of the process and the process itself. It is observed that the participants and the drama teacher look for answers to some questions with improvisation in role, and when they go out of improvisation, they combine the clues for the questions by making aesthetic (for the form of improvisation), intellectual (for the subject discussed in improvisation), and educational assessment (for the objectives and achievements of the drama lesson). Drama also gives participants the opportunity to explore their emotions. The participants take part in the drama work and at the same time they begin to understand how people in the society feel. Similar to Heathcote (1991), who defines improvisation as "*putting*

yourself in other people's shoes and using personal experiences to help you understand their point of view," participants who improvise in drama lesson put themselves in other people's shoes, trying to think and feel like them.

"Improvisation, which has never been determined before or is little designed, is spontaneous, takes place freely and exists with people" (Adıgüzel, 2019) refers to both a strategy and the activity in which the strategy is used. Improvisation, which is not planned in advance and contains ambiguity, creates a feeling of surprise in audience (Metinnam and Karaosmanoğlu, 2021). Improvisation also requires spontaneous speaking and acting without rehearsing by identifying a role (Baldwin, 2019). In drama lessons, the participants try to solve the existing problem by improvising and by taking the roles of different people and determining a place. It can be said that improvisation is both a problem-solving activity and a tool or form used to solve the problem. Improvisation, like other art forms, has certain structuring principles. As an improvised form with principles such as determining, maintaining or terminating a role, it is an effective tool that participants use to explore the solution of certain problems in dramatic fiction.

When participants are going to improvise, they first pull out any situation from the dramatic fiction. This is conveyed to the participants by the drama teacher verbally, with a text, with sound or with a visual (photo, picture, short film, cinema, etc.) or the participants determine this situation themselves. In the improvisation work that can be done individually, in pairs or in groups, the participants try to convey the situation given to them with their voices, gestures and facial expressions or speech to the participants who are integrated audiences. As such, it can be defined as an impromptu performance, animation or a show. However, at this point, the essential thing is to present the improvised content on the axis where creativity, imagination, spontaneity and pretending intersect. It can be said that improvisation should be structured instead of defining improvisation as a performance that is conveyed to the audience in an impromptu manner. In drama lessons, improvisation is not structured step by step, its beginning is determined by the participants or the drama teacher, the middle and the end are not clear. However, it will be meaningful if the improvisation is carried out in accordance with the dramatic fiction, and if it clarifies a question that needs to be answered within the fiction or a curious or suspicious situation.

It can be said that the space where the improvisation takes place has both a physical and a dramatic quality, and the two affect each other. The physical features of the space, defined as the stage or the aesthetic space, should be structured in accordance with the improvisation of the "reserved for improvisation" area. The items to be used in improvisation, the chairs or the objects used by the participants to take the roles constitute this physical space. However, it is a fact that there is no obligation to use similar physical objects in improvisation. Participants can improvise as if there are objects, things, or people they verbalize by pretending. The dramatic or fictional quality of the space, on the other hand, comes into being in the process that improvisers or audiences create in their minds and put their imagination and creativity to work. For instance, a participant in role asked, *"See that tree over there?"*, the integrated audiences create that tree in their minds, even though there is no physical tree in the direction pointed. Along with the COVID-19, digital platforms have also been added to these places. Participants do various activities, take roles and improvise in drama classes held in digital spaces. The digital platform, which has a different meaning from face-to-face drama studies, also directly or indirectly, positively or negatively affects the improvisation studies. For this reason, it is thought that it is important to determine the opinions of the participants about the improvisation studies in digital platforms and to reveal how the participants define the digital environment and the improvisation studies carried out in this environment in order to increase the quality of the future drama studies. The aim of this research is to determine the opinions of the participants about the improvisations made in the digital platforms. For this purpose, answers to the following questions will be sought:

- Which strategies did the participants improvising in the digital platform use before improvising?
- Which strategies did the participants improvising in the digital platform use during improvisation?
- What are the situations that affect the participants positively or negatively in the improvisations made in the digital platform?

2. Method

2.1. Research Design

In this research, it is aimed to evaluate and interpret the improvisations carried out in the digital platform. During the research, participants reflected their perspectives and experiences on improvisation, and shared their thoughts on which strategies they used before and during improvisation. Participants gave examples of positive and negative situations they encountered in improvisations. As such, the research can be defined as an interpretive qualitative research (Merriam, 2002; Merriam, 2009; Merriam & Grenier, 2019). In the research, the experiences of the participants who improvised in the digital platform were tried to be discovered, made understandable and interpreted. It was tried to interpret how the participants interpreted their experiences, how they construct the world around them semantically, and how they made sense of their experiences, based on the feature of "individuals are based on the idea that they construct reality in interaction with their social world", which is the most characteristic feature of qualitative research (Merriam, 2009; Merriam & Tisdell, 2016). According to Patton (2015); The common question of studies constructed using basic qualitative research is "*What are the practical implications and useful applications of what we can learn about this topic or problem?*". The main reason for using basic qualitative research in this study is to understand and increase the application possibilities of improvisation, which is the basic strategy in drama studies, which started to be applied online intensively with COVID-19. It is thought that the views of the participants who took the drama lesson will contribute to this purpose, and the results obtained with the designed and implemented online drama lesson program will make the application examples more understandable. For this reason, information about the content of the lesson and the context of the improvisations performed in the lesson is given below:

Online Drama Lesson Program

The online drama lesson topics can be expressed as "*Theoretical information about drama, Similarities and differences between drama and theater, Elements of drama, Improvisation and role-playing strategies, Improvisations, Analysis of movies in accordance with the elements of drama, and Improvisations related daily life*". Practical studies were carried out after the lectures were made with the participants in accordance with the theoretical dimension of drama. The following situations were used in the improvisation studies carried out in the online drama lesson. Some situations were determined by the drama teacher, while others were designed with the participants. The participants were asked questions regarding the following situations, which can be considered as the pretext or the beginning of the dramatic fiction; The elements of drama such as human context, role, space, time, tension, atmosphere, focus and symbol were discussed.

- When the fisherman, who is married and has two children, goes to his boat, where he earns his living by fishing, he encounters a very strong storm. The fisherman owes it to dangerous people. Today is the last day of payment. He remains undecided whether to go fishing.
- After a while, a family that does not consume anything other than broccoli moves to the neighborhood where people who only like to eat cauliflower live. The neighbor, who hospitably welcomes the family, changes his/her attitude when he/she learns the details of broccoli.
- The gardener who has been tending the roses in the garden of a large house for many years learns that the new owner of the house has decided to cut the roses and organize the garden for a different purpose. The rose garden is very important for the gardener. Because the roses are inherited from the former owner of the house.
- Students who go to the library to prepare for the exams begin to argue with the people listening to loud music on their headphones.
- The customer, who realizes that the yoghurt he/she bought from the market has passed its expiry date, takes the yoghurt back and wants to return it. But the cashier doesn't want to take the yogurt back.
- A university student who is not happy in her department wants to take the university exam again, but his/her family is against this situation.
- Living in a town where dancing is prohibited, a young woman dreams of becoming a dancer. That's why she does secret dance practice. One day, one of the inhabitants of the town sees her. He runs to inform the others.
- A villager living in the Amazon Jungle of South America is forced to leave his village due to climate change. He lost his wife a year ago. They migrate to a big city with their three children. However, the city does not welcome them very warmly.
- A university student hides his real financial situation from his friends. An unexpected coincidence reveals the truth. The relationship of the student with his friends is no longer the same as before.

2.2. Participation Characteristics

During the COVID-19, many lessons were held in a digital space, and educators and students participated in these lessons by using the possibilities of the digital environment. In the lessons, various possibilities of the digital platform, and tools such as camera, microphone, chat box, waiting room were used to enrich the lesson. The participants of the research consist of 21 undergraduate students (17 women, 4 men) studying at different departments at Ankara University, who attended the online drama lessons in the 2021-2022 academic year. The ages of the participants ranged from 18 to 35. All of the students who continue their undergraduate and associate degrees in the departments of different faculties are in the first year. In order to create the study group, the purposeful sampling technique, which was created with examples that would present the richest and closest data in the focus of the research, was used (Yin, 2016). The students included in the study group were required to have chosen the drama course definitively. The faculties and departments of the students are given in *Table 1*.

Table 1: Faculties and departments of the participants

Faculty	Department
Faculty of Language, History and Geography	Turkish Language and Literature (3), Folklore (2), Arabic Language and Literature (1), Anthropology (1), Korean Language and Literature (1), Italian Language and Literature (1)
Faculty of Science	Physics (1)
GAMA Vocational School	Alternative Energy Resources (1), Electricity and Energy (1)
Faculty of Nursing	Midwifery (1)
Faculty of Law	Law (1)
Faculty of Health Sciences	Child Development (1), Health Management (1)
Health Services Vocational School	Medical Documentation and Secretarial (1)
Faculty of Applied Sciences	Real Estate Development and Management (1)
Faculty of Veterinary Medicine	Veterinary (3)

It can be said that the pre-research drama experiences of the participants were quite limited. 15 participants had not participated in the drama study before. One of the participants took drama lessons in primary school, two of them participated in improvisation studies before, and three of them took part in the theater group in secondary school, high school or university.

2.3. Data Collection Tools and Data Collection

Data were collected online with "*Assessment Form for Improvisations in Digital Platform*" which was developed considering the research questions¹. The interview is carried out in order to express a behavior, action, belief or point of view of the person participating in the study (Yin, 2016). In this study, it was aimed to reveal the perspectives and evaluations of the participants regarding the improvisations they made in online drama lessons through an interview. Opinions were received from two experts working in the field of drama during the preparation of the form, from an expert who had experience in collecting data through interviews in qualitative research processes, and from a language expert who reviewed the interview form with the focus of language and expression. The electronic link address of the interview form, which was finalized in line with the expert opinions

¹ The research process was carried out by the Ankara University Ethics Committee within the framework of the ethics committee decision dated 25/04/2022 and numbered 10/121.

received and transferred to the online environment, was shared in the communication groups of the sample participants, and the participants were expected to answer the questions. The participants consisted of students who decided to take the elective drama course, whose registration was finalized and who participated in the course.

2.4. Data Analysis

The data were analyzed by descriptive analysis, and the findings were explained according to the determined themes and categories. The data were summarized and interpreted according to the previously determined themes (Yıldırım and Şimşek, 2013). The data obtained from the participants' opinions were categorized according to the determined themes and the relationship between the codes, and the created categories were explained in detail under the themes (Miles & Huberman, 1994). In this study, the relationship between the research problem and the purpose of the study was taken into consideration, and a sample selection was made in accordance with this relationship. In addition, data collection tools were developed to be relevant to the purpose of the study to ensure validity. All the data were recorded in reliable ways (the interview form created in the electronic environment records all the writing as soon as it is answered), deciphered without any intervention, the opinions of the participants were conveyed as they were, and an objective point of view was tried to be made by minimizing the researcher bias. In addition, procedures such as data analysis and presentation were carried out considering the purpose of the research. One of the most common methods used to ensure the validity and reliability of qualitative research and to strengthen its credibility in this way is triangulation (Merriam & Grenier, 2019). Triangulation/diversification can be performed by employing any of the ways such as data sources, researchers working on the same research, the theoretical approaches and methods to be used while interpreting the data set (Yin, 2016; Patton, 2015). In this study, a variation was made on the data analyzes carried out independently by the researchers working on the research, and an opinion was taken from another expert about the data analysis. Thus, it was tried to ensure consistency between codes, categories and themes. Because a qualitative research should be able to convey the reality it tries to describe at the highest possible level. This is called the reality value of the work (Noble & Smith, 2015). Consistency between coders is a part of the strategies applied to reflect the reality that qualitative research deals with in the most accurate way. In addition, direct quotations containing the views of the participants supporting the themes were included in order to strengthen the reliability of the research. These quotations were chosen with care to show the variety in the sample. While interpreting the direct quotations, the prejudices of the researchers were suspended as much as possible and the reality to be reflected was tried to be conveyed in all its dimensions. Another strategy to increase the validity, reliability and credibility of qualitative research is applicability/transferability. The results of a qualitative research should be such that it can be a source for other research and can be used by other researchers (Noble & Smith, 2015). In order for the results of the study to be a source for new research in the literature, attention was paid to associating the categories and themes with the common concepts used in the literature, and the findings were tried to be presented by associating them with the main discussions in the literature.

3. Results

In this section, the findings obtained as a result of the analysis of the research data, the themes and categories related to the findings are given. As a result of the content analysis of the qualitative data in the research, the themes and categories in *Table 2* were reached.

Table 2: Themes and categories created with the results obtained

Themes	Categories
Strategies Before Improvisation	Conversations about elements of drama
	Information sharing about dramatic fiction
	Talking about conflict/tension resolution
	Making movie analysis
	Voice and breathing exercises
Strategies During Improvisation	Making use of the elements of the drama

			Creating dramatic fiction (Thinking about dramatic fiction)
			Using experiences
			Empathy (Putting yourself in the character's shoes)
			Thinking about the characteristics of the characters
			Trying to be solution oriented
			Guessing what the other would say
			Focusing on role
			Involvement of drama teacher or other participants
			Effective use of the microphone
			Not using the camera
Factors	Affecting	Improvisation	Quiet and organized place
Positively			Preparation before lesson
			All participants have to improvise
			Supportive attitude of drama teacher or participants
			Effective use of message section
			Lack of a suitable place to connect to the lesson
			Gestures and facial expressions do not cross over
			Leaving the microphones on
Factors	Affecting	Improvisation	Not using the camera
Negatively			Stress, excitement, anxiety
			Inability to focus (lack of attention)
			Repetition of the same sentences, short answers, immediate persuasion

3.1. Strategies Before Improvisation

Participants make a plan in their improvisation work and act in accordance with this planning. In this respect, the improvisation design of the participants has different stages. Improvisation, which can be handled under two headings as pre-performance and performance process, includes various strategies. The findings obtained in the research stand out as the strategies used by the participants *to talk about the elements of drama before improvisation, to share information about dramatic fiction, to think about the resolution of tension or conflict, to make use of or analyze movies, and to do sound and breath exercises*. Participants also said that they prepared for the performance before improvisation. Although the preparation includes intellectual and physical skills, it contains clues for a dramatic fiction. Because improvisation, which is the process of creating an intellectual fiction and performing with body language, gestures and mimics, verbal and vocal open to all kinds of surprises, requires an intellectual and fictional planning. The statements of the participants show that they made some preparations and used some strategies before improvisation in planning based on fiction.

The research findings show that the participants talked about the elements of the drama before the improvisation, and they benefited from these elements about how the improvisation would progress. It is seen that the participants, who define improvisation as creating a framework, create a framework for themselves with the elements of drama and improvise using this framework. At this point, P8 said, *"After determining the characters, dramatic tension, time and place, we established a bond between them to create an event. Then we improvised and produced solutions for conflicts or problems,"* and P12 said, *"First of all, I did not make any preparations because it was a certain situation, subject, time, place and person, or because it continued with the improvisational flow,"* and emphasized the elements of drama are used effectively before improvisation. In P8's words, it shows that it provides the connection to create the event (dramatic fiction). P14 said, *"I thought of a text, one of the indispensable elements of dramatic fiction, and used whatever should come in order. They were like a recipe for me while I was preparing my improvisation,"* she said that she used the elements of the drama before improvisation, and she did it in a sequence.

Participants state that they see improvisation as a fiction, a sequence of meaningful actions or a plot. One of the participants, P21, who stated that she thought about a dramatic fiction before improvisation and benefited from the elements of the drama in the process of creating this dramatic fiction, said, *"I think examining the elements of the dramatic fiction helps us a lot about the improvisation we will do. Because it allows us to understand what kind of situation we are in if we have never faced such a situation before: 'Are we nervous? Are we happy? Are we living in ancient times? Are we in today?'"* questions help us. At the same time, it gives me clues about what the atmosphere is like, what kind of character I play, what job I'm doing, what kind of dramatic tension will develop." She said that with these words, they created a fictional life by using elements of drama, and the questions they asked about the dramatic fiction made their job easier. P16 said, *"While creating the dramatic fiction one of the elements always stood out for me. For example, a symbol. I was able to create many situations using it,"* and expressed that she planned to improvise using one of the elements of the drama.

One of the strategies that the participants used before improvisation was the films that were discussed and analyzed in the lessons. The films, which were examined in accordance with the elements of the drama during the lesson, facilitated the work of the participants in the improvisation design. For example, P1 *"After talking about drama and its elements, we focused on what is required for improvisation and how to take the role. We did a lot of improvisation and short film work. We watched movies suitable for elements of dramatic fiction and analyzed them. Since almost every lesson we did an improvisation or film analysis, we were already prepared. Since I came to the new lesson by looking at the topics we covered in the previous week, I never had any problems,"* in her words, she talked about the effect of films before improvisation, the use of concepts such as dramatic structure and dramatic fiction.

In improvisation based on a tension, people try to resolve or to overcome this tension, which can be defined as conflict. Tension works like a mechanism that guides improvisation in this process. In the absence of tension, it becomes difficult for the participants to take a role and maintain the role. In the drama lesson, the participants, who create the dramatic fiction by determining the tension (conflict) before the improvisation, also share their ideas on how to resolve the tension or conflict. This sharing also gives the participants an idea about how improvisation will progress or end. In this regard, the words of P8, *"After we understood the conflict well to take the role, we thought about solutions,"* shows that understanding the conflict is as important as finding solutions. The participants, who created a framework for the design of improvisation, said that it is important to talk about how long the tension, which is one of the most important elements in this design, will be sustained. It is very important for the participants how they use their voices during improvisation and how their voices reach other participants. In a situation where only the microphone is used, in other words, the only communication tool is the microphone, the voice must effectively convey the improvised dialogues to the other party. It is seen that some participants practiced sound before improvisation in the drama lesson, where the cameras were not turned on and the microphones were turned on only during speaking. For example, P5 said, *"I went to a quiet place and checked my breath and tried to adjust my tone,"* and he stated that he prepared for improvisation by controlling his voice and breathing, and P14 said, *"Because it was online, I felt like I was talking to myself because I was giving alternative talks to myself while my other friends were improvising,"* while other participants said that they made individual preparations while improvising.

3.2. Strategies During Improvisation

The participants, who create the dramatic fiction before improvisation, make a performance in accordance with the dramatic fiction during the improvisation. Since improvisation is not a process in which the participants memorize a text by studying over and over again and then act it out on stage, and it is clear what the improvisers will say and what kind of actions they will take after the improvisation starts, it is necessary to develop various strategies during improvisation. Improvisation is not only a simple technique, but also a process of designing an intellectual plot in which the dramatic fiction is spontaneously constructed. Since this process is not always individual, a collective dramatic fiction is created with the group members who will take part in the improvisation. In improvisation, mutual interaction, creativity, spontaneity and contribution to collective production progress simultaneously. Improvisation is always open to surprise, as it is not clear what, when and how it will emerge. Although a framework is created before improvisation, it is a dramatic fiction that only has a clear beginning, middle and end. However, improvisation may not progress as previously discussed. Different solutions can be

found or it is possible to go out of the planned fiction. In the online drama lesson, the participants benefited from *the elements of drama during improvisation, creating dramatic fiction (thinking about dramatic fiction), starting from experiences, empathizing (putting yourself in the character's shoes), thinking about the features of the character, trying to be solution-oriented, predicting what the other party would say*. They stated that they applied the strategies of focusing on the role. Some of these strategies (utilizing the elements of drama, creating dramatic fiction, thinking about dramatic fiction, starting from experiences) are similar to the strategies used before improvisation. The main reason for this is that although improvisation includes certain stages, it is a whole in itself and each of the parts has an effect on the whole. In addition, the elements of the drama act as a kind of compass, as improvisation is an impromptu and unscripted animation. The framework created through the elements of drama before the improvisation is an important tool that enables the improvising participants to deal effectively with uncertainty and solving the problem causing tension.

Improvisation can also be defined as making a new proposal to the person or persons opposite. This offer requires people in the role to communicate, to create a shared story and to discuss a specific topic within the role. Participants stated that during improvisation, *they used the elements of drama to create a common story and created an intellectual dramatic fiction*. It can also be defined as the process of creating an improvised, collective dramatic fiction that requires creating an instant fiction, designing the performance step-by-step in mind, and giving consistent and appropriate responses to the dramatic fiction. This process, which requires thinking about dramatic fiction, invites the participants to make an in-depth research on the role characters of the improvised situation and their relationship, space, time or tension. This process, which starts before the improvisation, does not end with the beginning of the improvisation, on the contrary, the participants continue to develop the story spontaneously, taking into account the framework they have created. By putting themselves in the place of the characters in the dramatic fiction, the participants try to overcome the problem they face or to reflect on the problem. Participants stated that they created a fiction in their minds before improvisation and that they acted in accordance with this fiction. In addition, they stated that they benefited from the elements of drama in the process of creating dramatic fiction, and that they created an alternative fiction in their minds. P21 said, *"I think I could take a role more comfortably by using my body if it was face to face, but if I had to give an example, what would I do if I were a boatman or a hairdresser, what kind of environment would I have grown up in, what is the climate of the place I live in, what kind of people are around me, I don't speak a dialect of a place. I tried to integrate myself as much as possible with all the characters I played, thinking about all the details I could think of, such as whether I am speaking with a dialect or in a proper Turkish,"* in her words, she explained elements of drama she used during improvisation and the dramatic fiction she created. P13, *"I adjusted my speaking style in the role and what I would say according to the progression of the tension,"* in her words, she stated that she also determined how the improvisation of tension, one of the elements of drama, would progress.

Drama studies are based on role playing and improvisation. In drama studies, the participants choose some roles and try to make these roles visible. This means that the participants act like the person in the role they have determined, they speak like this person, they improvise taking into account the characteristics of this person. At this point, it can be said that experiences are very important in drama. Participants review their previous experiences while role-playing or improvising. Participants stated that they benefited from the situations they observed in their lives during improvisation. At this point, it is possible to say that while determining a role or improvising, the participants set off from their experiences and at the same time improvise the situations they see in daily life. Experiences are effective both when preparing improvisation and when designing improvisation. In other words, experiences are effective before and during improvisation. P8 said, *"The events we improvised were things you encounter in real life. I think that the solutions that we think and produce on these conflicts can work in my life,"* and she stated that experiences in daily life are used in improvisation and at the same time, the solutions in improvisations contribute to her. Similarly, P9 said, *"There were examples from the events we encountered in our lives and we heard many different reactions. Therefore, we thought, yes, we imagined it would be like this, and this affected our reactions as well,"* adding that the exemplary situations in her life were reflected in improvisation. P16 said, *"Of course there was, for example, the concept of space helped us a lot in how we should behave even if we were in such a place or environment as a spectator,"* in her words, she emphasized that the use of space in improvisation was supported by experiences in daily life. The statements of the participants about the experiences show that their previous experiences, the people they observed, the places, situations or problems were effective in their role during improvisation.

During the improvisation, the participants tried to empathize by putting themselves in the characters' shoes. Empathy not only reduced the distance between the characters and the participants, but also created a suitable environment for the participants to own the dramatic fiction, to take the initiative and act on the development of the dramatic fiction. P18 said, *"I think putting myself in someone else's shoes while improvising increased my empathy ability, it also gave me practicality, that is, it made me think quickly when there was a problem and taught me that sometimes both sides can be right."* and emphasized that she used his empathy skill in the improvisation and that improvisation improved this skill. Empathy, as P18 expressed, is one of the requirements of improvisation, just like creativity, spontaneity or pretending. In other words, the participants need to use their empathy skills when taking on a role and improvising. They also develop their empathy skills through improvisation. At this point, P14's statements, *"I improvised by putting myself in the role I was going to play. When I take a role, I remind myself of this and act according to that person's feelings."* also supports P18.

The participants stated that they thought about the features of the characters in the dramatic fiction as an improvisation strategy, tried to be solution-oriented and predicted what the other participants would say, and focused on the role. For example, P6 said, *"I can say that reading other friends' thoughts helped me, it helped me find my own ideas."* and tried to read the thoughts of the people she improvised with her words, and P12 said, *"I tried to be solution-oriented or I used to compel strategies, depending on the situation,"* and she stated that she was trying to be solution-oriented. *"I tried to give as many different situations and reactions as possible. I tried to predict the characteristics and reactions of people in order to portray the same situation differently,"* expressing herself with these words, P11 said that she thought about the characteristics of the role. The findings show that the participants use different strategies during improvisation, and these strategies are effective in the progress of the dramatic fiction.

3.3. Factors Affecting Improvisation Positively

Improvisation can be defined as a planning process that includes not only speaking spontaneously, unpreparedly, and unbound to the text, but also taking on a role, maintaining a role, and terminating a role. In this planning, the participants create an intellectual dramatic fiction and take care to act within this fiction. In order for the participants to improvise on dramatic fiction, some conditions must be met. The results show that there are situations that positively affect the improvisations made in the online drama lesson. In the online platform, the participants do not see each other and cannot use forms of expression such as body language, gestures and facial expressions in improvisations based on sound and speech using only a microphone. In improvisation studies, the involvement of the drama teacher or group members, the effective use of the microphone, the absence of a camera, a quiet and orderly environment, preparation before the lesson, the obligation to participate in improvisation, the supportive attitude of the drama teacher or the participants and the effective use of the message section affect the participants positively. In order for the online drama lesson to be more effective, there are some situations related to the online or physical environment, the drama teacher and other participants, and the people who improvise. The positive effect of these situations contributes to the better improvisation of the participants.

Participants stated that the spontaneous involvement of drama teachers or other participants during improvisations or when improvisation does not work properly is effective in terms of the quality of improvisations or observing different perspectives. About this subject, P2 said, *"The teacher's encouraging the students or starting improvisation by himself, when necessary, had a positive effect on the lesson. When someone got stuck, our teacher or another friend immediately stepped in,"* and P7's statements, *"Our teacher helped us progress by contributing to the flow of improvisation, and the other students followed the flow so that the next one could continue comfortably,"* show that there is a spontaneous outside intervention in the improvisations in online drama lesson, and that this happens in a way that does not spoil the fiction. Participants described this intervention as a situation that positively affects improvisation and enables it to continue. According to the participants, there are some positive aspects of not using cameras in online drama lesson. P6 said, *"I don't think it's much different than face-to-face, I can only say that it was for the benefit of some shy friends."* and stated that not using a camera, shy people improvise more easily, and P9 said, *"Partly it's easier actually because they don't see you, you don't see the reactions and it's easier. You are not affected by the counter-reactions,"* and she stated that they were not affected by the reactions of the other participants in an environment without a camera. Not using the camera, which is normally a negative situation for an online drama lesson, was evaluated positively by some participants. With

her statements, *"We did not open the camera, our friends who did not have a microphone also participated in the chat section by writing, and this is how we solved the problem,"* P14 said that the chat section was used in case of a technical problem.

Online drama lessons require some technological opportunities. Students need a device with computer features (desktop, laptop, tablet or mobile phone), a healthy and stable internet connection, camera and microphone that will connect to the digital platform where the course is held. Students should also be in a quiet environment and not be in a noisy place that will negatively affect them during improvisation. It is considered important that the environment is calm, quiet and orderly for the participants who connect to the online drama lesson from a different environment. One of the participants, P18, said, *"In general, I take care not to have distracting objects around, I pay attention not to have too loud noises,"* and stated that she took care to keep the place she was tidy and quiet. Similarly, with the words, *"The situation that makes it easier is that the environment is calm. I can focus and improvise more easily in a calm and quiet environment,"* P20 emphasized the importance of space.

3.4. Factors Affecting Improvisation Negatively

There are negative situations as well as situations that affect the participants positively in online drama lessons. These situations, which negatively affect the participants' role playing and improvisation, vary depending on the place, the person making the improvisation, other participants or the internet connection. In improvisation studies, *lack of suitable space, stress, excitement, anxiety, gestures and mimics do not cross over, inability to focus, lack of attention, repetition of the same sentences, leaving the microphones on, not using the camera, short answers and being quickly convinced* affect the participants negatively.

Research findings show that the problem that most affects improvisations is the lack of suitable venues for participants to attend the online drama lesson. Due to the fact that the lesson is online, it can be said that the students are connected to the drama lesson from places such as the canteen, an empty classroom or the school garden on the days when there are face-to-face lessons. With the words, *"I couldn't attend very comfortably when the room was not empty because I was staying in the dorm, it looked a little funny because I was playing different roles on the phone by myself, but I didn't see a big negative side of it,"* P6, stated that she had some difficulties participating in the lesson indoors or in an open area. P18 said, *"I think it has a negative effect because sometimes we can be in places that are not very suitable, and it can be difficult to turn on the microphone at such moments or our voice may not be very clear in a noisy environment,"* and she mentioned that the noise in the environment affects the improvisations negatively. P2 supported P18 with the words, *"Yes, there was a lot of noise when I entered the school and a lot of movement around disturbed me. It was more productive when I was able to enter the dormitory. But it didn't matter to me because I loved the lesson so much,"* and she said that her interest in the lesson was effective in overcoming the problems.

The results of the research show that emotional states such as stress, excitement and anxiety affect the participants negatively. P1, *"For me personally, yes, there were places where I got stuck in the beginning, and this was due to a situation that was completely related to myself. Even though it was involuntarily online, our lesson dominated the stress activity,"* she emphasizes that speaking in front of the crowd is also difficult on digital platforms. Similarly, P5 said, *"Even being aware of the existence of people listening to you, even if not face to face, creates some pressure, and I can say that it contributes to controlling the pressure when speaking to the crowd and reducing the stress caused by the pressure,"* and he talks about the difficulty of improvising in front of a crowd with his words. It can be said that if the participants are stressed, excited or anxious, they have difficulty in taking the role because the excitement is higher in the crowded group.

In online drama lessons, the first of the problems that negatively affect the improvisations are the problems arising from the connection. Problems such as gestures and mimics not moving to the other side of the screen, inability to focus, lack of attention, leaving microphones on, not using cameras affect improvisations negatively. P1 emphasized that connection problems in digital platforms negatively affected the lesson or that gestures and facial expressions did not pass to the other side during improvisation. P1 also stated that problems such as lack of attention and inability to focus occur in online lessons. Positively, she said that she could research a topic on the internet during the lesson whenever she needed it.

In terms of negativity, I can also state the following. Since the lesson is online, we encountered connection problems during participation. Or online lessons may be insufficient in terms of the reflection of our gestures and facial expressions. In fact, this situation has both pros and cons. Missing part: Although it provides convenience for some, the online lesson has always created a missing part for me. Because when it is outside of the classroom environment, it is highly likely to experience a lack of attention. Or we may have to deal with more than one thing (especially for a married person who looks after his/her family). The plus is that when we encounter a concept we do not know during the lesson; we can make instant research on the internet and make progress more consciously."

P8 said, *"We couldn't improvise face-to-face because our lesson was online. I think there is a deficiency in this regard, especially since mimics and gestures are effective on improvisation,"* and she similarly stated that connection problems negatively affect improvisations. Some problems that negatively affect improvisations in online drama lessons are about the participants. *Situations such as repetition of the same sentences, leaving the microphones on, short answers and immediate persuasion* cause the participants to have problems in improvising. With the words, *"The short answers given by the other participants sometimes prevented the continuation of the improvisation."* P18, underlined the short answers during the improvisation prevented her from continuing the role, and P17 said, *"The fact that the other party was immediately convinced, that is, that he did not continue the role for a long time, both prevented me from continuing the role and reduced my motivation a little,"* and emphasized that the immediate persuasion of the other participants in improvisation reduced his motivation to continue the role for a long time. P2 also, *"After a while, he/she started repeating the same sentences, I got stuck in a certain place, I couldn't think of anything,"* with her words, she said that the other party's repetition of certain sentences prevented her from continuing the improvisation. In addition, the poor connection, disconnection during the lesson, and freezing caused problems in maintaining the role of the participants.

4. Discussion

In this study, it was aimed to determine improvisation strategies used by the participants who improvised in online drama lessons before and during the improvisation, and to determine the situations that affect the improvisations positively or negatively according to the opinions of the participants. As a result of the findings, the themes of *"Strategies Before Improvisation, Strategies During Improvisation, Factors Affecting Improvisation Positively and Factors Affecting Improvisation Negatively"* emerged. The results of the research reveal that the participants determined some strategies in order to improvise with a higher quality, and they used these strategies before, during improvisation, or in both situations.

The improvisations in drama lessons form the core or heart of the lesson, where the actual learning takes place. Through improvisations, the aesthetic and educational achievements of the lesson are reached, the participants acquire some attitudes and behaviors, review themselves, and observe the different perspectives of the other participants. As such, improvisation activities need to be carried out completely, in accordance with the purpose and in accordance with the dramatic fiction discussed. For this purpose, the participants benefited from the elements of the drama included in the syllabus before and during the improvisation. It was observed that the participants talk about the elements of drama before improvisation, share information about dramatic fiction, think about the resolution of tension or conflict, make use of or analyze movies, and do sound and breath exercises. Since improvisation takes place spontaneously and freely (Adıgüzel, 2019), the strategies developed on how to improvise before improvisation may not be sufficient. Therefore, the person performing the improvisation must develop strategies during improvisation in order to continue his role by coping with the unpredictability and ambiguity that arises due to the nature of improvisation. Within the scope of the research, the participants used the elements of drama during improvisation, creating dramatic fiction, using experiences, empathizing, thinking about the features of the characters, trying to be solution-oriented, predicting what the other party would say. It was concluded that they used strategies such as predicting and focusing on the role. Among these strategies, especially the strategies of using the elements of drama and thinking on dramatic fiction are similar to the strategies developed before improvisation.

Although improvisation can be performed individually, it often takes place embedded in a social setting (Zenk & Hynek & Schereder & Bottaro, 2022). The conditions of the environment in which the improvisation is embedded determine the conditions that affect the improvisation process positively and negatively. The research results reveal that the participants expressed some situations that they think affect the improvisation process positively and negatively. Conditions that positively affect improvisation according to the participants; the involvement of the drama teacher or group friends, the effective use of the microphone, the absence of a camera, a quiet and orderly environment, preparation before the lesson, the obligation to participate in improvisation, the supportive attitude of the drama teacher or the participants, and the effective use of the message section. Situations that negatively affect improvisation are expressed as lack of suitable space, stress, excitement, anxiety, gestures and mimics do not cross over, inability to focus, lack of attention, repetition of the same sentences, leaving the microphones on, not using the camera, short answers and being quickly convinced. Some of the situations that affect improvisation positively and negatively complement each other in the opposite direction. While the effective use of the microphone is seen as a positive situation, it is seen as a negative situation if the microphone is turned off or left on unnecessarily. Likewise, a quiet and orderly environment is expressed positively, while the absence of a suitable place to improvise is shown as a negative situation. The fact that the cameras are turned off is seen as a positive situation, which is a remarkable result. Some participants stated that being off the camera reduces the excitement and anxiety of improvisation.

In drama works, improvisations gain continuity with conflicts arising from a dramatic tension. Real-time action, reaction and interaction (Zenk & Hynek & Schereder & Bottaro, 2022) is required to do what is said. If dramatic tension is not strong enough, it can reduce the quality of the conflicts. Therefore, improvisation is short-lived as it cannot be continuous. One of the reasons for short answers and being quickly convinced, repetition of sentences, and lack of attention, which the participants expressed as one of the situations that negatively affect improvisation, can be shown as the inability to create a strong enough tension for improvisation. Since tension is the core of dramatic fiction, it directly and positively affects the belief in the role and the fiction, the motivation to stay in the role, and the desire to resolve the conflict. One of the most important situations that positively affect improvisation is that the drama teacher supports the process by taking roles. The role of the drama teacher motivated the participants and helped them become more willing to improvise. Making supportive comments about the improvisations performed was another positive situation. In online drama lessons, the internet infrastructure, the digital platform and equipment such as mobile phones, computers, cameras and microphones are as effective as the environment in which the students attend the lesson. It can be stated that the chat box of the digital platform where the drama lesson is held stands out as a feature that solves the participation problem arising from the environment and equipment. If the participant who entered the class at the time of the lesson was not in a suitable environment and did not have the appropriate equipment, he/she participated in the lesson by writing from the chat section. This can be seen as one of the advantages of the online drama lesson.

Considering the themes that emerged in the research and the opinions of the participants regarding these themes, it can be concluded that the basic principles or planning steps of improvisation do not differ in online and face-to-face environments. Real-time action takes place with very little preparation for improvisation, both online and face-to-face. In both environments, there are unpredictability and ambiguities arising from the nature of improvisation, and improvisation has a beginning, a middle and an end. In both environments, the form of improvisation is created by utilizing the elements of drama and by thinking about dramatic fiction, especially tension. Strategies such as thinking about the characters, predicting what the other party will say, and being solution-oriented are strategies that can be applied both online and face-to-face before and during improvisation. Again, in both environments, participants may experience excitement, anxiety and stress, and they may perform improvisations that are quicker and unsatisfactory due to some disruptions in creating the dramatic fiction. However, the products that are the output of the improvisation may differ in the online and face-to-face environment. Since the online environment is limited in terms of physical meeting, contact, use of the body and the senses, technological equipment and infrastructure play a major role in ensuring the necessary communication and interaction. The role of technological infrastructure and hardware becomes more important, especially in an event such as improvisation that requires real-time action, reaction and interaction. This is also the reason why the participants think that they cannot adequately convey their emotions, gestures and facial expressions while playing a role.

The results of the study are similar to other studies on improvisation. Ebert (2004) states that in improvisation, the actor finds and implements action and text on the stage, unprepared, but adhering to a theme or a certain event, but not depending on a text. Meyer (2021), on the other hand, states that the improvising individual works on two elements. The first is the process of introverted experience, and the other is the outward transfer of it. From the results of the study, strategies such as thinking about the elements of the drama before and during the improvisation, dramatic fiction, and the role character are the main tools to find and apply the action and text directly on the stage. In addition, the same strategies are effectively used for exporting introverted experiences. In Zenk & Hynek & Schreder & Bottaro's (2022) study, in which they investigated improvisation as a phenomenon by conducting in-depth interviews with experts working professionally in highly dynamic fields such as art, entrepreneurship and emergency response service, they would encounter unpredictability in situations where they thought they were improvising, and to cope with it. It has been revealed that they know that they can prepare themselves in a very short time. It has been stated that the mentioned short preparation period includes simulating in mind what they can do through alternative scenarios they may encounter, or physical or cooperative warm-up exercises. The pre-improvisation strategies of the interviewed experts in this study are similar to the preparation processes for improvisation in their own professional fields. The results of Granholt and Martensen's (2021) research on the use of improvisation in design, regarding the importance of active listening and acting to continue improvisation with the other party, are similar to the results of this research being solution-oriented and empathizing with the other party. In another study (Crossan & Cunha & Cunha & Vera, 2002), which deals with the role of improvisation in the improvement of time planning in an organization, it was concluded that improvisation gave positive results in planning time based on creativity and spontaneity in a limited time, and employees benefited heavily from their past experiences in this process. Making use of past experiences was expressed as one of the strategies used by the participants while preparing for improvisations. In the study (Roud, 2021), which was carried out with experts working in jobs requiring emergency response, focusing on the uncertainty of emergency response and the necessity of quick response skills, the importance of increasing the collective improvisation skills of organizations working in this type of work was emphasized. It was stated that collective improvisation skills would be developed more effectively by building trust between institutions. In this study, the role of the trainer, which the participants showed as examples of situations that positively affect improvisation, and everyone's participation in improvisation, has an effect on increasing in-group confidence. In other words, it is important in terms of making improvisation happen better.

As a result, there are some difficulties in conducting drama lessons and performing improvisational activities online. Despite these difficulties, it is possible for the participants to improvise using only microphones, express themselves in role and act in accordance with the dramatic fiction. According to the results, it can be recommended to inform the participants about improvisations in terms of form and content in the studies to be carried out online, to create the dramatic fiction with the participants before the improvisation, and to improvise in this direction. Improvisation studies can be made more qualified by giving various examples during the lesson, by talking about the elements of dramatic fiction during the role-playing stage, or by watching short and feature films.

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The Effects of Plickers on English Vocabulary Achievement, Motivation and Anxiety

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Abstract

The purpose of this research is to examine whether the use of Plickers in English language teaching has any effects on students' motivation, anxiety and academic achievement. In this context, this study was held with 61 students studying in the ninth grade of a high school that is located in a rural region in the east part of Turkey. In this research, the effects of Plickers tool on students' vocabulary learning motivation, anxiety and academic achievement within the scope of English lessons were discussed. The result of the analysis showed that the motivation and academic achievement of the study group increased significantly compared to the control group. A significant increase was seen in the control group students while a significant decrease was found in the experimental group students in terms of the anxiety variable.

Keywords: Plickers, Foreign Language, Anxiety, Motivation, Vocabulary

1. Introduction

Being accepted as the common language, English has come to the fore in the field of science, art, literature, education and business, thus learning English and acquiring English language skills have become a necessity (Rao, 2019). Knowing English is the most important way of communicating all over the world, being aware of the world and making your voice heard. At the point of English, countries have different language teaching-learning policies and curricula in accordance with these policies (Jarvis, 2005). It can be claimed that English education curricula are determined on the needs of societies, and the needs of society are affected by developments such as the advancement of technologies used in daily life and the emergence of new teaching methods and techniques.

The majority (90%) of educators in Europe are using technology to prepare their lessons (Chhabra, 2020). Technology has become an important fact of society that supports students in terms of understanding the world in deep and is not limited to what they learn in the classrooms (Warschauer, 2000). Today, it can be thought that technologies such as computers, mobile phones, tablets, and internet connections are parts of daily life and this situation causes technology to create a global infrastructure for students to learn. Technology has changed the learning habits of today's generation Z students (Masita & Mağaza, 2020). In educational environments, teachers need new methods and techniques that can meet the requirements of students, which is the reason why teachers

use various applications among which interactive boards, tablets and web 2.0 tools can be considered (Kozikoğlu & Babacan, 2019). In addition to changing the roles of teachers in the classroom, information technologies also offer various software and websites that can be handled in educational processes (Ruthven, Hennessy, & Deaney, 2005; Seal & Przasnyski, 2001). With this research, the effects of Plickers web 2.0 tool that can be considered within the scope of information technologies, on English vocabulary were discussed.

1.1. Technology Assisted Language Learning

As technology becomes a part of people, educators are looking for ways to adapt technology to education and enable students to make the most of technology, and studies on technology integration in education are being carried out (Bradley, 2020; Burch & Mohammed, 2019; Selli Hernawati, 2019; Silva, Silva, & Bilessimo, 2020). Mobile Learning, as its name implies, often takes place outside of the classroom while waiting or wandering around (Stockwell, 2008), and this indicates a transition from the traditional computer-assisted (CALL) language learning concept that often occurs within a classroom (Stockwell, 2012). Mobile technologies can effectively increase students' proficiency in language acquisition process (Sung, Chang, & Yang, 2015). Yang (2013) stated that the improvement of mobile technology also improves language teaching and learning processes.

Digital technology has been recognized as one of the most prominent driving force behind language learning, particularly in the last decade, has attracted attention as an educational tool, drastically changing the tradition of teaching English (Abbasova & Mammadova, 2019). Nawaila, Kanbul, & Alhamroni (2020) stated that technology is inevitable at the point of fostering teaching and learning. Based on this statement, it can be said that technology use in English teaching and learning can facilitate the learning process. Students who learn English often need the basic skills (listening, speaking, reading and writing) exercises to enhance their abilities (Ybarra & Green, 2003). These needs in foreign language learning can be covered with ease by using technology (Nawaila et al., 2020). In this study, within the scope of students' basic language skills, vocabulary knowledge was discussed and the effects of the Plickers tool were investigated.

In a research made by Saran, Seferoğlu, & Çağiltay (2012) some techniques were examined such as mobile devices, web pages via computers and classic paper format to investigate the most functional method. The research result showed that learners who used mobile devices to practice English vocabularies learned more. Basoglu & Akdemir (2010) stated that learning vocabularies using mobile devices is more efficient than paper formats such as flash cards. Sandberg, Maris, & De Geus (2011) stated that using smart phones to learn English is better for students as mobile devices can be taken everywhere, which allows continuity of learning, and "anytime, anywhere" specialty. Learning vocabulary with mobile technologies has a positive contribution on student learning as well as increasing the teachers' effectiveness (Chen & Li, 2010; Kim & Kim, 2012). Mobile technology use for English vocabulary can enhance learning thanks to the facilitation technology can provide (Basoglu & Akdemir, 2010; Cavus & Ibrahim, 2009; Thornton & Houser, 2005). Mobile devices can be used as a dictionary and students can easily reach these dictionaries, allowing them access to relevant information, thus saving time. Song & Fox (2008) stated that students could use mobile devices as "internet-supported dictionaries" that facilitate students to improve their vocabulary skills. In addition, Sato, Matsunuma, & Suzuki, 2013 concluded that acquiring foreign language vocabulary by using mobile technologies increases knowledge of vocabulary. Thus, students save on cognitive resources that they can refer to later for reading, resulting in successful reading comprehension in a foreign language (Sato, Matsunuma, & Suzuki, 2013).

Information technologies that can be used in foreign language education include computers, smartphones, tablets and interactive boards, as well as various web 2.0 software such as Facebook, YouTube, Kahoot, Plickers, Socrative and Padlet. Macaskill & Owen (2006) describes Web 2.0 tools as "web-based platforms" where users can share their content such as video, audio, text, graphics and pictures, write notes, comment on these contents, and interact. Harris & Rea (2019) stated the necessity of Web 2.0 tools in education with the following words: "Web 2.0 tools expand the classrooms and even make the world itself a class."

Plickers is a web 2.0 application that enables the interaction between cameras and mobile phones by scanning QR-Code cards via a mobile application and is used within the scope of assessment and evaluation. In this study, the assessment and evaluation dimensions of web 2.0 tools are discussed. Among the most known web 2.0 tools that

can be considered as assessment and evaluation processes are tools such as Kahoot, Plickers, Quizizz etc. In order to use Kahoot and Quizizz applications in teaching process, both students and teachers must use technology actively. This may become impossible for students studying in disadvantaged regions in terms of technology accessibility. On the other hand, the Plickers tool, which is planned to be used in this study, only requires the use of technology by the teacher. Thus, the necessity for students to have a computer, tablet or smartphone is eliminated, making applicability easier. Instead of such technologies, students are given QR codes that are automatically prepared by the system in advance, and students are involved in the process with these code cards. Students answer the questions by rotating these cards given to them.

1.2. The Aim and Importance of the Research

Foreign language teaching in Turkey has not reached a successful level (Deregözü, 2021). Anxiety and motivation levels in foreign language education can be counted among the reasons that affect performance (Becirovic, 2020). Language is important in terms of providing opportunities for the individual in many ways such as generating ideas, revealing the produced ideas, learning and gaining personality (Özbay, 2010). Without words, the smallest structure of the language, these abilities cannot be formed (Ersoy & Boyacı, 2018). In other words, it can be said that a person cannot fulfill the language function without vocabulary.

Vocabulary knowledge in a second language is essential to have an effective communication, and therefore vocabulary is often seen as a substantial matter for foreign language students (Alqahtani, 2015). Learning vocabulary elements in English learning is thought to take a significant part in all language skills “listening, speaking, reading, and writing” (Nation, 2013). Vocabulary knowledge while learning a foreign language has an essential part in high-level language acquisition processes such as reading comprehension, text model and grammatical structure comprehension (Chall, 1987). Based on these, it can be concluded that it is a necessity to have vocabulary knowledge in foreign language acquisition. This study is also important as it addresses vocabulary knowledge directly.

Low motivation is a vital problem in vocabulary knowledge as well as learning English (Tanaka, 2017). When students listen to the meaning, pronunciation and spelling of new words from their teachers in a passive way, their motivation to learn vocabulary decreases (Huyen & Nga, 2003). This situation pushed researchers to study student motivations in foreign language and vocabulary learning (Aydın, 2020; Bai, 2018; Tanaka, 2017; Wang, Huang, & Hsu, 2015). This study is important in terms of addressing vocabulary learning motivation.

It can be said that learning vocabulary in a foreign language takes time, and this can be considered as one of the reasons why students always experience anxiety in learning vocabulary (Su-chun, 2012). Although studies show that there is a negative correlation between vocabulary knowledge and second language anxiety (Chen, 2015), there are limited studies on vocabulary learning anxiety rather than foreign language anxiety in general (Chen, 2015; Önem, 2015). According to the Input Hypothesis, students can acquire the target language by accepting comprehensible inputs when they have high motivation, self-reliance, and low anxiety (Krashen, 1992), and it can be said that foreign language vocabulary learning process also requires these conditions. This research is essential in terms of contributing to the literature on students' vocabulary learning anxiety.

Various researches on the use of the plickers tool in teaching and learning processes were found in the literature review (Chng & Gurvitch, 2018; Kent, 2019; Krause et al., 2017; Wood et al., 2017; Zengin et al., 2017). In addition, some studies can be found regarding Plickers in foreign language education (Michael et al., 2019; Nguyen, 2019; Sasmiko et al., 2019). However, in the literature review conducted within the scope of this research, no study regarding Plickers tool was found for vocabulary knowledge in English language education processes. In this study, the use of Plickers in English lessons was discussed, and on this occasion, the variables of vocabulary learning motivation, vocabulary learning anxiety and academic achievement were examined. This study is thought to be important as it contributes to the literature in terms of the Plickers tool with motivation, anxiety and vocabulary knowledge in English language education.

This study aims to examine whether Plickers use in English language teaching has any effect on students' motivation, anxiety and vocabulary achievement. As mentioned in the problem situation of the study, it is thought

that vocabulary knowledge, vocabulary learning motivation and vocabulary learning anxiety have an essential place in English language teaching and learning. In this context, this study aims to examine students' vocabulary learning motivation, vocabulary learning anxiety and academic achievement regarding English Vocabulary using the Plickers tool.

In this context, answers are being sought to the questions given below.

1. What is the effect of using Plickers on vocabulary learning motivation?
2. What is the effect of using Plickers on vocabulary learning anxiety?
3. What is the effect of using Plickers in English classes on academic achievement?

2. Method

2.1. Research Model

In this study, quasi-experimental design with pre-test -post-test control groups was used within the scope of quantitative research methods.

2.2. Study Group

The study group includes 9th-grade students in a rural area in Van province of Turkey. The study was carried out in the first term of the 2020-2021 academic year. In determining the participants, convenience sampling was taken as a basis. A total of 61 students, 31 of them in the research group and 30 of them in the control group, took part in the research. Descriptive data regarding the control and experimental groups are shown in Table 1.

Table 1: Descriptive Data Regarding Control and Research Groups

	Demographic features	Category	Number (N)	Percent (%)
Control Group	Gender	Male	16	53
		Female	14	47
	Computer use	Yes	5	17
		No	25	83
	Phone use	Yes	10	33
		No	20	67
Experimental Group	Gender	Yes	19	61
		No	12	39
	Computer use	Yes	5	16
		No	26	84
	Phone use	Yes	17	55
		No	14	45

The control group includes 16 (53%) male and 14 (47%) female students. Five (17%) of the students use a computer while studying, 25 (83%) of them do not use a computer. Ten students (33%) use a phone while studying, 20 (67%) do not use a phone while studying.

The experimental group includes 19 (61%) male and 12 (39%) female students. Five (16%) of the students use a computer while studying, 26 (84%) of them do not use a computer. Seventeen students (55%) use a phone while studying, 14 (45%) do not use a phone while studying.

2.3. Context and Data Collection Process

The participants of this research consisted of 9th-grade students who study in a rural area in Van province of Turkey. As the students live in a rural area, majority of the participants' interaction with digital-technology realize only at school environment. Interactive boards and internet infrastructure are available at the school. The study was conducted during the first term of the 2020-2021 education year in a time interval that the schools were open

temporarily due to the COVID-19 pandemic. As the shutdowns and openings due to the pandemic were not foreseen, accessibility to the schools and students was the priority while conducting this research. Taking this into consideration the samples were determined. Although the samples consisted of students with similar backgrounds, due to the constraints of sampling, the first measurement results of the groups were taken as the covariance variable. Thus, ANCOVA was used to eliminate the weakness of the sampling. More importantly, as it was stated by Dugard & Todman (1995) “an ANCOVA on post-test scores, with pre-test scores as co-variate usually provides a more appropriate and informative analysis”.

Within the scope of the pre-test, the participants in the research and control groups were applied a vocabulary learning motivation scale, vocabulary learning anxiety scale and vocabulary achievement test. Vocabularies were studied by using the Plickers tool for three weeks with the experimental group, while in the control group, classes were taught using worksheets containing matching and multiple-choice exercises. For the last step of the process, vocabulary learning motivation scale, vocabulary learning anxiety scale and vocabulary achievement test were applied to the research and control groups within the scope of the post-test.

The data collection tools were examined with the authorities of the institute and it was evaluated that the participants would not be harmed physically or psychologically in any way, and that their identity privacy was protected; therefore, it has been stated that there is no need for an ethics committee decision.

2.4. Data Collection Tools

In this research, four data collection tools were used: demographic information form, vocabulary learning anxiety scale, vocabulary learning motivation scale, and vocabulary achievement test. Detailed information on these data collection tools is given below.

2.4.1. Demographic Information Form

A form was created by bringing together the variables frequently encountered in the literature review on the subject of the research by the researcher. Through this form, students' information such as gender, age, and whether they use a mobile phone while studying or not.

2.4.2. Vocabulary Learning Anxiety Scale

The vocabulary learning anxiety scale aims to define the anxiety level of the learners while learning foreign language. The vocabulary learning anxiety scale created by Zhao et al. (2016) including 10 statements in 5-point Likert type. These items are brought together to determine the anxiety level of learners experience once they face with unknown vocabularies while reading. Participants answered 10 items on a Likert scale between 1 “strongly disagree” and 5 “strongly agree”. Zhao et al. (2016) found the internal consistency value (Cronbach's alpha) of the scale as 0.81. Since the scale of vocabulary learning anxiety is not in Turkish, two English teachers whose native language is Turkish first translated it into Turkish. As a result of the first translation study, the translation was evaluated by a total of three people, including a specialist academican and two English teachers who have graduated from the Computer and Instructional Technology Department (CEIT). With an agreement on the translation, two experts translated the scales back into English. At the end of this process, it was concluded that the translation was compatible with the source language, and small changes were made in the scales in a way that would not affect the meaning in order to adapt the scale semantically. A pilot study was conducted to determine whether each item has the same meaning for each student. The translated version of the scales was examined with a group of 20 people.

Content validity and structural validity were examined at the point of validity of the scale. Seeking an expert opinion is among the possible ways to test the content validity (Büyüköztürk, 2004). In this context, the opinions of four experts, two of whom are foreign language experts and two of them are experts in the field of CEIT, were taken. In order to establish the expert opinions on the validity of the scale items, a form with two responses as “appropriate / valid” and “not applicable” was used. The agreement levels of the experts for each scale item were

determined to be 90% -100%. In line with this ratio, it is accepted that the scale has content validity (Büyüköztürk, 2004).

Exploratory factor analysis was used to check the structural validity. According to the Barlett test ($p = 0.000 < 0.05$), the variables were seen to have a relationship. As a result of the KMO, sample size suitability was calculated as $0.655 > 0.60$. This value is considered sufficient for factor analysis (Kalaycı, 2010). The varimax method was used in the factor analysis and the structure of the variables was not changed. As a result of the factor analysis for the vocabulary learning anxiety scale, a factor was determined and it was concluded that this factor explains approximately 57% of the variance. The explained variance can be accepted as sufficient evidence for the validity of the scale. Explanatory Factor Analysis revealed that the items have factor load values varied between 0.49 and 0.72 in a single factor scale structure. Since the factor loads of each item are higher than 0.30, it has been found that the items are suitable for a single factor scale structure (Tabachnick & Fidell, 2013).

For the reliability of the scale, a Cronbach's alpha test was runned to observe internal consistency. The Cronbach's alpha value was seen as 0.72, which indicated that the scale reliable enough to be used in Turkish.

2.4.3. Vocabulary Learning Motivation Scale

The aim of the vocabulary learning motivation scale is to define the motivation level of the learners while acquiring a second language. The vocabulary learning motivation scale (Ersoy & Boyacı, 2018) consists of 24 items in 3-point Likert type. The scale aims to determine the motivation levels of students in learning vocabulary while learning a second language. In the development study of the scale, Cronbach's alpha value was found 0.85. The scale consists of 3 sub-dimensions: intrinsic motivation, extrinsic motivation, and purposeful motivation. Cronbach's alpha internal consistency value was reported as 0.85 in the scale's development study.

2.4.4. Achievement Test

The aim of the achievement test is to identify the vocabulary achievement level of the learners while learning a foreign language. The questions were obtained from the attainment tests published by the experts in the field, working at the a public school as English language teachers. The questions in the achievement test were gathered based on the 9th grade English textbook in public high schools called Teenwise. The achievement test includes 20 multiple-choice questions. The test was evaluated over 100 points, with five points for each question. The KR21 internal consistency value of the achievement test used for this study was found as 0.96.

3. Findings

In order to examine the pre-test and post-test data regarding the motivation, anxiety and academic achievement variables of the research and control group students for the research questions, paired sample t-tests and ANCOVA tests were performed. Findings obtained regarding the tests are listed below.

3.1. Motivation

The students went through two different processes, the Plickers tool in the research group and the paper based method in the control group. The results of ANCOVA performed to find out whether the change in vocabulary learning motivation of students in the research and control groups differ significantly is shown in Table 2.

Table 2: Vocabulary Learning Motivation Pretest - Posttest ANCOVA Results

Source of Variance	Sum of Squares	df	Mean Square	F	P
Between Subjects	8,754	60			
Group	,007	1	,007	,050	,824
Error	8,747	59	,148		

Within Subjects	1,682	61			
Measurement	,165	1	,165	6,646	,012
Group*Measurement	,054	1	,054	2,175	,146
Error	1,463	59	,025		
Total	10,41	121			

Considering Table 2, it is concluded that the vocabulary learning motivation levels of students who went through two different processes did not differ significantly in terms of pretest and posttest. In other words, the common effects of being in different groups and repetitive measures factors on vocabulary learning motivation are not significant, $F(1,59) = 2.175$, $p > .05$. This finding shows that Plickers do not have different effects on increasing students' vocabulary learning motivation compared to traditional methods.

In this study, the researcher's focus is on testing the effects of only two different applications on increasing students' vocabulary learning motivation, so the common effect of group and measurement factors are emphasized. Analysis also includes basic impact tests of group and measurement. The two main impact tests mentioned in this study can be interpreted in this way: There is no significant difference between the total mean scores obtained from the pre-test and post-test scores of the individuals in the experimental and control groups, $F(1,59) = .050$, $p > .05$. As can be seen, this test does not take into account the changes of the groups from pre-test to post-test. Regarding the main effect of measurement, it can be said that there is a significant difference between the pre-experiment and post-experiment motivation scores of the individuals involved in the study without making a group distinction, $F(1,59) = 6.646$, $p < .05$.

Since there is no significant difference in the motivation of the control group ($t(29) = -.59$, $p > .05$) as a result of the paired sample t test performed for the vocabulary learning motivation variable of the experimental and control groups of the study, only the experimental group data are presented. Experimental group data are given in Table 3.

Table 3: The Paired Sample t Test Results Regarding the Vocabulary Learning Motivation Variable

Group	Scale and sub-dimensions		N	\bar{x}	SD	T	df	P
Experimental	Motivation (total)	Pre-test	31	2,43	,37	-4,90	30	,00
		Post-test	31	2,54	,27		30	,00
	Internal	Pre-test	31	2,40	,41	-3,94	30	,00
		Post-test	31	2,48	,31		30	,00
	External	Pre-test	31	2,37	,39	-5,04	30	,00
		Post-test	31	2,52	,34		30	,00
	Purposeful	Pre-test	31	2,58	,41	-2,79	30	,00
		Post-test	31	2,71	,30		30	,00

When Table 3 is examined, the experimental group students' total motivation pre-test mean score is found to be 2.43 (SD = ,37) and the post-test mean score is found to be 2.54 (SD = ,27). As a result of the paired sample t test, this increase in the motivation variable is found to be significant ($t(30) = -3,24$, $p < .05$).

3.2. Anxiety

The students went through two different processes, the Plickers tool in the experimental group and the traditional method in the control group. The results of ANCOVA performed to find out whether the change in vocabulary learning anxiety of students in the experimental and control groups differ significantly is shown in Table 4.

Table 4: Vocabulary Learning Anxiety Pretest - Posttest ANCOVA Results

Source of Variance	Sum of Squares	Df	Mean Squares	F	P
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Between Subjects	1227,081	60			
Group	1187,129	1	1,115	1,647	,204
Error	39,952	59	,677		
Within Subjects	1,877	61			
Measurement	,196	1	,196	10,346	,002
Group*Measurement	,564	1	,564	29,780	,000
Error	1,117	59	,019		
Total	1228,958	121			

Considering Table 4, it is concluded that the vocabulary learning anxiety levels of students who went through two different processes differed significantly in terms of pretest and posttest. In other words, the common effects of being in different groups and repetitive measures factors on vocabulary learning anxiety are significant, $F(1,59) = 29.780$, $p < .05$. This finding shows that Plickers has different effects on students' vocabulary learning anxiety compared to traditional methods.

The focus of this research is on testing the effects of only two different applications on students' vocabulary learning anxiety, so the common effect of group and measurement factors are emphasized. Analysis also includes basic impact tests of group and measurement. The two main impact tests mentioned in this study can be interpreted in this way: There is no significant difference between the total mean scores obtained from the pre-test and post-test scores of the individuals in the experimental and control groups, $F(1,59) = 1.647$, $p > .05$. As can be seen, this test does not take into account the changes of the groups from pre-test to post-test. Regarding the main effect of measurement, it can be inferred that there is a significant difference between the pre-experiment and post-experiment anxiety scores of the individuals involved in the study without making a group distinction, $F(1,59) = 10.346$, $p < .05$.

The paired sample t test data for the variable of vocabulary learning anxiety related to the experimental and control groups of the study are given in Table 5.

Table 5: Paired Sample t Test Results Regarding the Vocabulary Learning Anxiety Variable

Group		N	\bar{x}	SD	T	df	P
Experimental	Pre-test	31	3,13	,73	5,02	30	,00
	Post-test	31	2,91	,63			
Control	Pre-test	30	3,18	,45	-2,30	29	,02
	Post-test	30	3,24	,47			

When Table 5 is examined, it is found that the anxiety level pre-test mean score of the experimental group students is $\bar{X} = 3.13$ ($SD = .73$) and the post-test mean score is $\bar{X} = 2.91$ ($SD = .63$). The change in anxiety level is found to be significant in favor of the experimental group as a result of the paired sample t test ($t(30) = 5.02$, $p < .05$). The anxiety level pre-test mean score of the control group students is $\bar{X} = 3.18$ ($SD = .45$) and the post-test mean score is $\bar{X} = 3.24$ ($SD = .47$). The change in anxiety level is found to be significant against the control group as a result of the paired sample t test ($t(29) = -2.30$, $p < .05$).

3.3. Achievement

The students went through two different processes, the Plickers tool in the experimental group and the traditional method in the control group. The results of ANCOVA performed to find out whether the change in academic achievement of students in the experimental and control groups differ significantly is shown in Table 6.

Table 6: Academic Achievement Pretest - Posttest ANCOVA Results

Source of Variance	Sum of Squares	df	Mean Squares	F	p
Between Subjects	11404,098	60			

Group	218,144	1	218,144	1,151	,288
Error	11185,954	59	189,592		
Within Subjects	72,302	61			
Measurement	51,403	1	51,403	7,084	,010
Group*Measurement	19,436	1	19,436	2,679	,107
Error	1,463	59	7,256		
Total	11476,400	121			

According to Table 6, it is concluded that the academic achievement levels of students who went through two different processes did not differ significantly in terms of pretest and post test. In other words, the common effects of being in different groups and repetitive measures factors on academic achievement are not significant, $F(1,59) = 2.679$, $p > .05$. This finding shows that Plickers do not have different effects on increasing students' vocabulary learning motivation compared to traditional methods.

In this study, the researcher's focus is on testing the effects of only two different applications on increasing students' academic achievement, so the common effect of group and measurement factors are emphasized. Analysis also includes basic impact tests of group and measurement. The two main impact tests mentioned in this study can be interpreted in this way: There is no significant difference between the total mean scores obtained from the pretest and post-test scores of the individuals in the experimental and control groups, $F(1,59) = 1.151$, $p > .05$. As can be seen, this test does not take into account the changes of the groups from pretest to post-test. Regarding the main effect of measurement, it can be said that there is a significant difference between the pre-experiment and post-experiment achievement scores of the individuals involved in the study without making a group distinction, $F(1,59) = 7.084$, $p < .05$.

The paired sample t test data for the academic achievement variable related to the experimental and control groups of the research are given in Table 7.

Table 7: Paired Sample t Test Results Regarding Academic Achievement Variable

Group		N	\bar{x}	SD	T	df	P
Experimental	Pre-test	31	38,70	7,84	-3,24	30	,00
	Post-test	31	40,85	8,85			
Control	Pre-test	30	36,83	11,63	-,68	29	,50
	Post-test	30	37,33	10,96			

When Table 7 is examined, it is seen that the experimental group students' academic achievement pre-test mean score is 38.70 (SD = 7.84) and the post-test mean score is 40.85 (SD = 8.85). As a result of the paired sample t test, it is seen that this increase in the academic achievement variable is significant in favor of the experimental group ($t(30) = -3.24$, $p < .05$).

When Table 7 is examined, it was found that the experimental group students' academic achievement pre-test mean score is 36.83 (SD = 11.63) and the post-test mean score is 37.33 (SD = 10.96). It is observed that the increase in the academic achievement variable is not significant as a result of the paired sample t test ($t(29) = -.68$, $p > .05$).

4. Results and Discussion

In this research, it was seen that the use of Plickers had significant effects in favour of the experimental group in increasing students' vocabulary learning motivation compared to traditional methods. Supporting this result, Sasmiko et al. (2019), in a research they conducted with secondary school learners concluded that when the Plickers tool is integrated into English classes, students' motivation to understand what they read in English is higher than traditional methods. Sasmiko et al. (2019) made the comment that the Plickers tool positively affects students' motivation in reading foreign languages. In another study conducted with primary school learners, it was found that the use of the Plickers as an assessment tool significantly increased students' motivation towards lessons compared to traditional methods (Daradkah, 2020). In the study conducted by Daradkah (2020), unlike this study,

Plickers was studied on general lessons rather than being limited to English lessons. Likewise, in another study carried out with high school learners, it was observed that students' motivation towards biology lesson increased significantly with the use of Plickers (Fortney & Wells, 2017). In this study by Fortney & Wells (2017), Biology lessons were discussed, but as in this study, Plickers was selected among web 2.0 technologies. Fortney & Wells (2017) commented that the Plickers tool increased students' motivation towards biology lessons. These results support the results found in this study. In the literature review conducted within the scope of this study, in studies conducted with the Plickers tool on motivation, no study was found indicating that the Plickers tool did not cause a significant change in motivation. On the other hand, Demir & Eren (2020) conducted another web 2.0 tool, KAHOOT! application and found out that there was no significant change in the motivation of the learners. The study conducted by Demir & Eren (2020) differs from this study in terms of the demographic characteristics of the study group and web 2.0 tool used. Demir & Eren (2020) attributed the reason for this result which contradicts the literature, that the motivation of the teacher may have affected the motivation of the students. Considering these studies obtained from the literature, it can be concluded that the motivation of the students generally increased in the lessons conducted with the Plickers application. On the other hand, it can be said that in studies in which an application similar to Plickers was discussed and a significant difference was not observed, the result could be explained by other variables rather than the tool used. The results reached in this research are generally similar to the results obtained from the studies carried out with the Plickers tool. In other words, it can be said that Plickers usage in English lessons increases learners' motivation.

In this study, it was observed that the use of Plickers had significant effects in reducing students' vocabulary learning anxiety compared to paper based methods, and there was a decrease in the level of anxiety in the research group, unlike the control group. Supporting the findings of this research, Park et al. (2020) found out in a study assisted with university students studying in a foreign language-teaching programme that the Plickers application reduced students' anxiety. Although the study group of Park et al. (2020) differentiates in terms of having different demographic features, it is similar to this research at the point of Plickers usage. However, in a research conducted in English lessons with 8th-grade students at a school located in a rural area in Samsun (a city in northern Turkey), it was observed that the Plickers tool did not contribute to reducing test anxiety compared to traditional methods (Korkmaz, Vergili, Çakır, & Erdoğan, 2019). In the study of Korkmaz et al. (2019), the participants are secondary school students living in a rural area and it can be said that this result may be due to their limited opportunities in terms of technology due to the rural location. Likewise, Tuncer & Şimşek (2019) concluded in their study with 5th-grade students from three different secondary schools in Diyarbakır (city centre in the south-east of Turkey) that the use of Plickers did not cause a significant difference in students' anxiety levels towards mathematics lessons. The study conducted by Tuncer & Şimşek (2019) differs from this study in that it is carried out for primary school students and in mathematics lessons. Tuncer & Şimşek (2019) stated in their study that the lack of significant difference in students' anxiety levels might be affected by the course teacher's good communication with the students which allows the students feel a comfortable classroom environment. Considering these studies obtained from the literature, it can be concluded that students' anxiety generally decreased in the lessons conducted with the Plickers application. However, it can be said that in studies with no significant difference, the result can be explained by other variables rather than the tool used. Taking the literature review and the findings of this research into account, it can be said that the use of Plickers positively affects the anxiety levels of students in foreign language vocabulary.

In this research, it was seen that the use of Plickers has different effects in favour of the experimental group compared to traditional methods in increasing students' vocabulary achievement. Supporting this result, in another study conducted with secondary school learners using Plickers, it was seen that the academic achievements of students for understanding English reading texts significantly differentiated in favour of the group studied with Plickers (Sasmiko et al., 2019). The research carried out by Sasmiko et al. (2019) is similar to this study in that it is implemented with Plickers, one of the web 2.0 tools, in English classes. Sasmiko et al. (2019) made the comment that the Plickers tool positively affects students' academic achievement in foreign language reading. Daradkah (2020) concluded in a study conducted with elementary school 3rd-grade students that using Plickers as an assessment tool significantly increases the academic achievement of learners in lessons unlike paper based methods. In the study conducted by Daradkah (2020), unlike this study, although it was studied on general lessons with primary school students, it was handled by using Plickers, as in this study. In another study conducted with high school students, it was observed that the academic achievement of learners in biology class increased

significantly with the use of Plickers (Fortney & Wells, 2017). Rather than foreign languages, biology was the subject in the study of Fortney & Wells (2017), but as in this study, Plickers was selected as web 2.0 tool. Based on their findings, Fortney & Wells (2017) commented that the Plickers tool increased students' academic achievement in biology lesson. Likewise, Tuncer & Şimşek (2019) concluded that the academic achievement increased significantly at the end of the three-week Plickers study they conducted for mathematics lessons. Rather than a foreign language, mathematics lessons were discussed in the study of Tuncer & Şimşek (2019), but as in this study, among web 2.0 technologies, the Plickers was selected. These results support the results obtained in this study. However, Korkmaz et al. (2019), in a research conducted with 8th-grade students studying in a rural area in Samsun, concluded that the use of Plickers did not statistically significantly affect the academic achievement of students in English lessons. Korkmaz et al. (2019) stated that although there was no significant difference, academic achievement increased a little and interpreted this increase by attributing it to the decrease in anxiety. Considering these studies obtained from the literature, it can be concluded that the academic achievement generally increased in the lessons conducted with the Plickers application. However, it can be said that in studies where no significant difference is observed, the result can be explained by other variables rather than the tool used. Based on the literature review carried out and the findings of this research, it can be concluded that the use of Plickers has a positive effect on learner's academic achievement in terms of foreign language vocabulary.

5. Suggestions

According to the findings of this study, it was found that Plickers implementations can be associated with motivation anxiety and academic achievement, as in similar studies. However, there are studies implying that these variables are not affected by using such tools. Therefore, studies that are more comprehensive can be carried out by including different variables in the research with similar web 2.0 tools.

This research was conducted in a rural area with the participation of socioeconomically disadvantaged students. Due to the students' inability to use such tools and their socioeconomic level, they may encounter a novelty effect when they have such opportunities, and a difference may have arisen in their motivation, anxiety and academic achievement. For this reason, results that are more meaningful can be obtained in determining the effects of the Plickers application by conducting such a study with students from different socioeconomic levels.

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The Analysis of the Views of Turkish Pre-service Teachers on Classroom Management Based on Three Movies: *The Chaos Class (Hababam Sinifi)*, *Dangerous Mind* and *Dead Poets Society 1990*

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Abstract

Classroom management is a recurrent topic in the context of teacher education in online, face-to-face and hybrid educational context. The skills of classroom management are one of the most considerable issues of the pre-service teachers. Thus, the teacher educators should make them equip with the classroom management skills. This study focuses on the pre-service teachers' views on analyzing three movies as *The Chaos Class (Hababam Sinifi)*, *Dangerous Mind* and *Dead Poets Society* according to the freshmen and sophomore students' view at Faculty of Education in a compulsory course of 'Classroom Management'. The findings showed that 'lesson planning' is mostly identified ones. Moreover, it is clear that Mahmut, Luoanna and John all are role models for the pre-service teachers in terms of their attitudes towards the students and their profession. This study implies that the pre-service teachers need comprehensible and practical knowledge to model for themselves.

Keywords: Classroom Management, Teacher Education, Pre-Service Teachers

1. Introduction

Due to COVID-19, the teacher education has to be transferred into the online processes. The teacher educators have started to integrate more videos and online materials into their instructional process and the pre-service teachers have engaged with more in the online classes. This has brought the importance of the movies on education as the tools for training them. They are beneficial to comprehend the aspects and processes in the classroom environment such as the interaction types, the routines of the classroom and disruptive behaviors. There are numerous movies to be analyzed with the students. However, the teacher educators should decide which movie is proper for the purpose in the context of the needs and expectations of their teacher candidates.

The classroom environment is a social learning environment for the teacher candidates to understand the relationships, manners and behavior. Therefore, the pre-service teachers should be equipped with the necessary skills and techniques to facilitate this social environment. Also, it is a crucial component of pedagogical knowledge in teacher education (OECD, 2018). Classroom management is a proactive process and is defined as “*a well-planned set of procedures and routines for avoiding problems, and having a plan in place for when misbehavior does occur*” (Lester et. al., 2017:399).

In addition, classroom management is a construct for the effectiveness of learning process (Atiles et. al, 2017). According to OECD (2018), teachers spend 13% of lesson time to organize their own classrooms and they would like to have more professional support for managing the classroom. It is considered as one of the requirements for academic achievement and students’ engagement in addition to few behavioral problems (Marquez et.al, 2016). Lester and his colleagues (2017:410) stated “effective teachers *manage* their classrooms whereas ineffective teachers *discipline* their classrooms.” Therefore, teacher candidates should be acknowledged about the necessary skills for classroom management so as to be effective teachers (Egeberg, 2016).

Classroom management can be considered as one of the issues to challenge the pre-service teachers since they could not be aware of the ecology of the classrooms as well as other problems. The class is the minute social system including all the shareholders. In other words, the students, their parents, the school environment, the region and the educational policies either directly or indirectly manipulate the classroom social conditions and cause various challenges in the classroom. Unfortunately, the pre-service teachers have almost little about these factors and they have to cope with the disruptive problems though they are unprepared, as this is called as “reality shock” (Siwatu et.al, 2017; OECD, 2018). This makes them feel trapped, isolated or even alienated sometimes (Dayıoğlu-Öcal, 2018). As a result, this signifies the importance of training pre-service teachers on classroom management. Furthermore, teacher’s self-efficacy is related to their classroom management skills (Atiles et. al., 2017; Kurt et. al., 2014, Bay, 2020). The higher self-efficacy level of the teachers is identified, the better classroom management skills are observed (Bay 2020, Siwatu et.al, 2017, Akkuş 2013). The self-efficacy of the pre-service teachers needs to be supported and empowered with different tools. (Aslan & Dayıoğlu-Öcal, 2012, Dayıoğlu-Öcal, 2018). McDonald & Hudder (2014) in their research, expressed a mentoring process in which Dan, as a novice teacher, and Joe, as a professor and mentor for him, collaborated together and solved the management problems Dan had come across. This experience sharing process obviously signifies that classroom can be a really dangerous environment for a teacher candidate if they have no skills to guide them appropriately (OECD, 2018).

Researches show that pre-service teachers face with more classroom management problems than experienced teachers (Siwatu et. al., 2017, McDonald & Hudder, 2014, Bayraktar & Doğan, 2017). This disrupts the instructional process and decreases the quality of the instructional time. Also, student engagement and student achievement in the classroom has strong relationship with the teacher’s classroom management skills (Flower et.al.,2016; Korkut, 2017). It is suggested that the teacher education programs should involve samples of misbehavior that the teachers could face with in the classroom. Brouwers and Tomic (2000) stated that teachers struggling with the classroom management problems could not conduct the instruction process properly so they are called as ineffective teachers. Selçuk and his colleagues (2018) found out that the competency of the teacher candidates differed according to the factors as gender, grade, time of the class hours and the field of the study.

In Turkish teacher education programs, all the teacher candidates are required to complete the pedagogical courses involved in their programs according to Council of Higher Education in Turkey. One of these courses specifically designed is ‘Classroom Management’. This two-hour course is conducted in the second or third semester according to the field of teacher education programs. It is theoretical and unfortunately the students have little chance to engage in the practice. This is one of the main criticisms emerged from this course. When the pre-service teachers face with the real ‘students’ and ‘classrooms’ at schools, they are more likely to feel insecure and worried (Korkut, 2017). Thus, the pre-service teachers should be more exposed to real-life situations rather than the demo lessons, simulations and role-plays. The only opportunity for the teacher candidates is ‘Practicum for Teaching’ in their fourth year and they are expected to demonstrate their management skills there. Of course, this cannot be considered enough. As a result of COVID-19, the course ‘Practicum for Teaching’ has to be done in the online classrooms in addition to face-to-face. Therefore, the students need to have more awareness of managing the online classrooms.

This study focuses on the movies on education the course and the students' analysis in the content of the course "Classroom Management", a compulsory course in teacher education program. The scope of this analysis is to find out the issues and aspects of 'classroom management' observed in three movies as *The Chaos Class (Hababam Sinifi)* 1975, *Dangerous Mind* and *Dead Poets Society*. The students were freshmen and sophomores at Faculty of Education enrolled in 'Classroom Management'.

2. Method

2.1 Research Questions

In this study, the main research questions are as below:

1. What are the problem field identified by the pre-service teachers in these movies?
2. How are the related constructs described by the pre-service teachers based on the movies?
3. What are the similarities and differences stated by the pre-service teachers related to classroom management in these movies?

2.2 Data Collection Procedure

In this study, the data collected from the pre-service teacher's term papers submitted for the course of 'Classroom Management'. Considering the challenges of employing the course 'Classroom Management' in the pandemic times, the researchers decided to analyze the project papers of the students on three movies as *The Chaos Class (Hababam Sinifi)* 1975, *Dangerous Mind* and *Dead Poets Society* to identify the classroom management constructs in the paper. These pre-service teachers are either freshmen or sophomore students at Faculty of Education in a state university in Turkey. The departments of the students were Foreign Language Education (English, German and French), Early Childhood Education, Elementary Education, Computer Education and Instructional Technology, Mathematics Education. In the requirement of the course, all the students were supposed to prepare an assignment to analyze three movies as *The Chaos Class (Hababam Sinifi)* 1975, *Dangerous Mind* and *Dead Poets Society* in pairs or in a group of 3-4. The total number of the term paper analyzed was 72 and the number of the students was 155.

The term paper assigned as one of the assessment component of "Classroom Management" course. The task involved analyzing three movies as movies as *The Chaos Class (Hababam Sinifi)* 1975, *Dangerous Mind* 1995 and *Dead Poets Society* 1990. The students were expected to identify *three main constructs as physical, humanistic, and instructional and lesson implementation and classroom interaction* in the classroom management. The assignment was required to consist of three parts as introduction, evaluation and conclusion. The first part focused on scrutinizing the topic and setting the context. The second part involved in the evaluation and the sample scenes and the transcription of that specific scenes and statements. The last part dealt with the general evaluation about the movies related to classroom management. These papers of the students on the task were collected from 2016 to 2020. The submission of was both online and the print-outs. The students prepared their papers in pairs and the group of 3-4. The students were informed about their assignments were to be used for the sake of the scientific researches by a consent form attached to their assignments.

2.3 Data Analysis

The content analysis was used in this study. In the first step, all the students' papers were analyzed by two researchers. The researchers identified the pre-determined key words such as "crowded classroom" and "time management". Then, they had a meeting to compare the key words identified and agreed upon them. The total of the codes identified by the researchers (N) was 741 and the codes they agreed upon were (n) 478. Thus, the interrater reliability was 0,64, which was considered as the moderate reliability level (Miles & Huberman, 1994). The distribution of all the codes identified according to the movies are shown in Table A1.

3. Results

The findings are constructed the concepts based on the research questions and in the literature. The concepts

emerged combined and listed under the titles of the themes as physical constructs, instructional constructs, human-based constructs, lesson planning, and misbehavior as in Table A2.

3.1 Physical Constructs

Physical constructs are basically considered as the setting of the classes regarding the content and course tools of the course. The readiness of the pre-service teachers is necessary before they get into the real classroom. In terms of this study, the sub-themes identified are ‘overloaded classrooms’ and ‘the large size of the classrooms’. The total student papers focused on this construct is 37 and the number of the construct referred most is 17.

The participants defined *The Chaos Class* with the adjectives of “overloaded, cold and noisy”. According to the findings, it is found out that “the number of the students in the classroom is 30 so the classrooms are crowded so the students’ personal area to be limited and to sit too close.” According to Başar (2014), the crowded classrooms are not efficient for the students to have a proper educational environment. One of the participants criticized the order of the classroom and stated that this leads to the problems of the classroom management as below:

In *The Chaos Class*, the traditional seating plan is a problem. This plan leads to a threat in classroom management. In *The Chaos Class*, one of the students, Necmi made a joke to Şaban, another student sitting in front of him by throwing a paper plane into his back. Also, in *Dead Poet Society*, the traditional seating plan is designed though the students sit individually. This can only be helpful only by arranging a space among the students so that there cannot be a problem.

Akın and his colleagues (2016) found out the similar case and highlighted the importance of the seating plan and how this impacts on the students’ misbehavior. In *Dangerous Minds*, the adjectives emerged are ‘spacious with big windows’, ‘dark’ and ‘noisy. This refers to the lightening and its effects on the students’. One of the participants expressed that ‘the darkness of the classroom environment caused the students behave ignorant and indifferent towards the content’. Also, *Dead Poet Society* is described as “traditional but appropriate for the teacher-student interaction” and “adequate lightening in the classroom”. It can be concluded that the awareness of the pre-service teachers impacts their skills in classroom management.

3.2 Instructional Constructs

In this study, instructional construct involves the themes as motivation (n=35), planning (n=23), evaluation (n=10), time management (n=7) and feedback (n=5). These are stated in two movies as *Dangerous Mind* and *Dead Poet Society*. Among these themes, motivation is mostly stated one among the all of them. In terms of motivation, a group of the participants commented on the manner of the teacher in *Dangerous Mind* by grading the students with the highest mark A and by expecting them to keep it as it is,

She (the teacher) expressed that she graded all of them the highest mark of “A” but the point was to keep the point as it was. This helps the students to get rid of the anxiety if grading. Also, she rewarded the students who can complete the assignments on time and are successful in the classroom.

Considering *Dead Poets Society* another group stated “the students started to learn the emotions and feelings behind the literary works instead of memorizing them and they had a view of art as a result of Keating’s literature course”. This statement indicates the power of the teacher on the students’ learning.

Compared to these two movies, the participants considered more problems in *The Chaos Class* than others due to lack of motivational aspect in the classroom. One group of the participants expressed that the students participated into the lessons just for making fun of the teachers and even teachers are not aware of them and they could not give understandable feedback to them. The group explained this as “lack of the repertoire of the teachers to motivate the students.” All the students in the class are repeats and have no care about the traditional ways of teaching. According to Akın et.al (2016), motivation is a necessity for the students to increase the engagement and the learned centeredness so this lacks in the students in *The Chaos Class*.

The planning is the secondary instructional construct stated by the participants. In *Dead Poet Society*, Mr. Keating had totally different planning and implementation of the lesson, which even caused a problem with the administrators and he lost his job. A group of the participants indicated Mr. Keating's extraordinary planning by exemplifying one of his statement from the movie: "Gentlemen, tell you what. Don't just tear off that page. Tear out entire introduction". This action makes the students amazed because Mr. Keating empathize their attitude towards the poem and act as they wish to do. This is an example of "instructional capacity of Mr. Keating" which directly impact on the attitude of the students; as a result, they start to build trust towards him in the learning process (Egeberg, 2016 & Lester et.al, 2017).

The participants identified *The Chaos Class* as the most challenging one in planning. One of the groups indicated that the teachers were usually reading the coursebooks, asking a student to present the content or writing the board the content and there was nothing to be considered as planning. Also, it is an indication that in the class the dominant teaching technique is lecturing rather than active involvement of the students.

The assessment part of the instructional process (n=10) is the other challenge identified by the participants. it is expressed that both teachers in both *Dangerous Minds* and *Dead Poets Society* have process-based evaluation; however, teachers in *The Chaos Class* have a product-based evaluation. One group of the participants stated:

We explored the case in *Dangerous Minds* where Mrs. Johnson asked some questions related to poems and evaluated their scores accordingly. Also, Mr. Keating asked the students to write their own poems for the evaluation. However, in *The Chaos Class*, evaluation is mostly associated with exams and they are used to threaten the students. The students are aware of this and they try to mock the teachers.

Therefore, *The Chaos Class* can be considered as the worst case compared to others.

Time management is another construct stated by the participants. Instructional process should be planned according to time allocation for each activity. The participants considered Mrs. Johnson's time management as the best in three movies. A group of the participants stated

Mrs. Johnson came to the classroom before the students to establish the environment. Also, as she realized that the students' attention had been low, she planned her lesson in advance. She never spends so long time for presentation and instructional part of the lesson but she focused on students' practice and reflection more.

In *Dead Poets Society*, one of the participants indicated that "the teacher could decide the time is enough when he could complete the tasks he formed in that specific learning objective." Thus, these movies confirm that ineffective classroom management inevitably causes to decrease time devoted to teaching and learning (Flower et al., 2016). Lester et al. (2017) focused on the effective time management by the teachers in the classroom to achieve their goals properly.

The last construct is feedback giving. In *The Chaos Class*, feedback giving was stated with "That's a great job!" and "Excellent" for the successful students. However, after these positive comments, the teachers went on the criticism on the others. In *Dead Poets Society*, Mr. Keating tried to encourage the participation of the students even if they answered the questions in a wrong way. In the scene which a student was reading a poem for his lover, other students started to laugh but Mr. Keating commented on "Your poem is a model one for the Romanticism; this is a great effort." In *Dangerous Minds*, Mrs. Johnson asked the students to identify the differences between the singer and the poet. She wanted them to find a poem by Dylan Thomas which was similar to Bob Dylan and she said this was a competition and she offered to have a dinner together as a reinforcement for their participation. In both *Dead Poets Society* and *Dangerous Minds*, feedback giving focuses on more encouragement and constructiveness whereas *The Chaos Class* deals with the teacher's criticism and despicable manner towards the students.

3.3 Human-based Constructs

In this study, it is found out that human-based construct involves the themes as parental pressure (n=19), student personality (n=17), administrative pressure (n=16), parental ignorance (n=13), and teacher quality (n= 9). In line

with these, as it is seen, parental pressure is mostly stated construct among all of them.

In *Dangerous Minds*, parental pressure is mostly stated sub-theme and it is considered the most painful one. The participants of the study emphasized the scene in which one of the most intelligent students, Neil, is attending a medical school under his father pressure though he is interested in theatre. However, at the end, he committed a suicide. This showed that the parental pressure was a significant construct in this movie.

The student personality is the secondary human-based construct stated by the participants. One group of the participants compared three movies and they commented “Unlike to *The Chaos Class* and *Dangerous Minds*, the students in *Dead Poets Society* are successful students and draw good profiles as they are the children of authoritative and prestigious parents.” Moreover, some other participants classified the students as social and alienated both in *The Chaos Class* and *Dangerous Minds*, but successful, shadow and social in *Dead Poets Society*. According to most of the participants, the students in *The Chaos Class* draw the most spoiled profiles. A group of the participants stated “The students in *The Chaos Class* does not take the courses into consideration seriously. They have to be there so they focus on spending time. Ironic and shabby attitudes of students are main focus in the film.” This is highly related to their parental ignorant attitudes and manner towards these students as the director of the school in the movie stated in parents’ meeting at school (Akin et al., 2016).

The administrative pressure is the third human-based construct. In all three movies, a group of the participants stated as follows:

Being a teacher as a profession is emphasized in three movies. However, school administrators are authoritative, oppressive and focus on training one type of student. Furthermore, especially in *Dead Poets Society*, the school administrators and parents put some leverage on students for the same goals, but they do not deal with the abilities, needs and wishes of them, namely, disregard them.

This clearly indicates that authoritative, oppressive manner of the school administrators bring about aggressive and violent behavior among students.

In terms of parental ignorance, the participants commented on the manner of the parents in *The Chaos Class* by giving a dialogue sample:

Mahmut Teacher: What does your father do?

Necmi (Student): I do not know exactly, but he is probably a trafficker.

Principal: Most of the boarding students come from Anatolia, Mahmut teacher, and their parents get rid of them. They just pay the school tuition, then, they do not even call.

The participants explained that “education does not merely include the learning system, but also the integration of parents and school collaboration.” They also defined that the wall of the classroom is ‘transparent’, not physically but figuratively the classroom is open to the impacts from outside; especially from the students’ parents and the local circumstances.

Considering teacher quality, the participants explicitly defined *Mahmut*, *Louanne* and *John* as qualified teachers in their social and cultural context. The participant expressed:

Mahmut Teacher is a representative of the idealistic Turkish teachers. Louanne Johnson is a good negotiator who is rational, responsible, and acts by considering even the worst possibilities. John Keating is a literary and free spirited teacher. He has an innovative teaching style.

All these teachers are good at dealing with the misbehavior in the classrooms because they focused on not the student as the agent of the behavior but not the source of the problem. According to Atilas et.al (2016), misbehavior can be a result of the culture how the teachers react to them. They all react to the misbehaviors by focusing the reasons behind that rather than accusing them off the actions themselves. This also emphasizes the social skills of the teachers to deal with the misbehavior in the classroom (Korkut 2017).

However, some participants criticized the teacher quality in *The Chaos Class* as below:

The teachers in *The Chaos Class* use a traditional teaching approach, namely, their only goal is to teach something. They are incompetent for motivating and engaging the students. There are some teachers who go on teaching although they are older than their retirement age. They are not only old, but also nearly deaf or blind due to their ages. They insult the students with some nicknames as “donkey man, animal man”. In this film, all of these attitudes and their cultural implications should not be disregarded.

In terms of Turkish context in 1970s, the teacher authority is the main source of the classroom order and the students are passive and expected to obey the rules. This critic indicated the source of the teachers’ authority has changed into the source of the interaction with the students in current times. The belief that the senior teachers have better classroom management strategies is not valid according to the manners of the senior teachers in the movies (Karakaya and Tufan, 2018).

As a result, it can be obviously stated that three model teachers are deployed in these movies in the characterization of *Mahmut*, *Louanne* and *John*. They are represented as model teachers in their own contexts and communities. Though there are some administrative and parental challenges they have faced with, they always focused on how to solve the problems proactively rather than waiting for the solutions from the others and authorities (Akın et. al. 2016 & Girardet 2018).

3.4 Lesson Planning

In this study, lesson planning involves the themes as warming up (n=44), motivation (n=39), assessment and evaluation (n=16), presentation (n=3) and revision (n=3). Warming up is mostly stated one among all of them. One of the participants commented on the manner of the teacher in *Dangerous Minds* and expressed that she performed all stages of teaching in one lesson:

Ms. Johnson started the lesson by asking students whether they know how to do karate? By asking this question, she achieved the first step of lesson planning: warming up. She also stimulated wish to learn and interest on students, namely, motivation. Then, she started to teach verbs by using fill in the blanks technique and she mentioned that the most powerful verb is ‘to choose’ and people always have a ‘choice’. In this way, she completed presentation step. For the assessment and evaluation step, she gave homework in groups on finding similarities between legendary singer Bob Dylan and Poet Dylan.

Also, some participants gave John Keating’s manner as an example for the warm-up: “He was whistling when he entered into the classroom. Then, he attracted students’ attention on the issue by asking which poem include “O Captain, My Captain” verse.”

The participants commented that in *The Chaos Class*, there is little lesson planning. One participant expressed “it is seen that teachers have no worries such as warming up and motivation while teaching. Moreover, the students distract the focus of the teacher so the teacher cannot reach presentation step”. Thus, the lessons always end in chaos and they cannot achieve any objectives in the courses. Furthermore, in the same movie, the participants commented on assessment and evaluation step:

When it comes to assessment and evaluation stage, by claiming: “I cannot make an examination for three months. Whenever I attempt, I find myself over the shoulders”, the teacher declares that he cannot perform correction and feedback process of assessment and evaluation step.

In *Dangerous Minds* and *Death Poets Society*, it can be concluded that *Louanne* and *John* are better at lesson planning compared to the teachers in *The Chaos Class*. This planning is the main reason behind their achievement in these challenging classrooms. This finding supports the importance of lesson planning for the novice teachers to conduct the classroom management in the studies of Akın et.al (2016) and Lester et.al. (2017).

3.5 Interaction in Class

In terms of the study, the total student papers focused on this construct is 86 and the terms stated frequently under the heading of interaction in class are teacher-student (n=35) and student-student relationships (n=29). In terms of

teacher behaviors to create communication in class, meeting (n=14) and knowing students' name (n=8) is considered most by the participants. One participant commented on the theme by comparing three movies in terms of teacher-student and student-student relationships:

In *The Chaos Class*, the relationship between teacher-student on communication in class is weak although the relationship between student-student is high. *The Chaos Class* has a brotherhood connection, but they spread terror towards other students inside the school. They bully them and exclude them from their cliques. In the movie *Dangerous Minds*, in terms of classroom communication, both teacher-student and student-student relationship is poor. One group that cannot tolerate each other, and in even their own groups has lack of communication. Together with the fight and conflict stemmed from the lack of communication, the atmosphere is becoming tense and this causes the breaking the rules. During the process of becoming a class that listen each other and feel respect, great effort is observed to empower teacher-student communication. In *Dead Poets Society*, teacher-student relationship in class is at hierarchical level. The students do not reflect their problems to their teachers. The classroom rules and levels are clear and strict. However, together with Mr. Keating, this level softened and turned into a positive and extraordinary one. In terms of student-student relationships, it is seen that students' guards take care of them and they protect each other.

Some participants categorized student-student interaction level by comparing three movies. One of the participants stated "*The Chaos Class*, the interaction among students is nearly primary group interaction. They do not have any formality level and always make fun of each other" and exemplified the conversation as below:

One student: A cat does not enter into the classroom.

Another student: (Referring another student in class) A donkey can, why not a cat?

In *Dangerous Minds*, though students did not care about the teacher at first, the teacher achieved to attract their attention and interacted with them. In this interaction between two students, Emilio and Raul and Louanne transformed from secondary group into primary one. In *Dead Poets Society*, the communication among students is primary group interaction from the beginning. As they live in boarding school, they feel close to their friends rather than their parents; therefore, they support each other as it is seen in the scene where Neil shared his dream of being an actor and his friends supported him as stated by one of the participants.

In conclusion, in these three movies, what Mahmut, Louanne and John as teachers have achieved is their success to interact the students and able to get into their cliques, of course by getting their trust.

3.6 Misbehavior

The participants identified 172 actions which can be categorized in this group. When the sub-themes are regarded, the most identified one (n=70) is breaking the classroom and/or school rules. This includes making the noise (n=14) and breaking the flow of the lesson (n=14). The other three actions are disrespectful manners (n=10), cheating (n=6) and attending the class late (n=5). In all these three movies, the classes were depicted as noisy and chaotic by the participants. Regarding *The Chaos Class*, the participants identified this class as the most challenging one. One group of the participants mentioned: "The age level of the students is above 15. The developmental changes in students' learning are not considered. This caused some problems in the classroom management and the implementation of the course."

The participants identified some scenes as the critical ones with regard to breaking the classroom and/or school rules. They criticized the students' meeting in a secret place by leaving the school in *Dead Poets Society* as this would be risky. In *The Chaos Class*, the participants mentioned the students were smoking in various parts of the school and the dormitory. Additionally, some participants commented: "The students came to class late and they said "Sorry" but in a sarcastic way. This manner is to break the rule of attending on time."

The participants scrutinized that the students manipulated their teachers in the movies by making fun of their physical weaknesses and degrading the behavior. (n=29). In *The Chaos Class*, the pre-service teachers exemplified this by the scene as below:

Teacher: Hey, you, wearing glasses at the back! What are you talking about?
Student: (By chewing gum) Nothing, teacher.
Teacher: Then, tell me what I was talking about.
Student: You were talking about something.
Teacher: (Touching his ears) Pardon?
Student: The weather was getting hotter and hotter, teacher.
Teacher: Well done, sit down.

As it is seen in the dialogue, the students are making fun of the teacher's deafness and they are ignorant towards the lesson content. Moreover, in the analysis of *Dangerous Minds*, a group of the participants stated that when Louanne, the teacher, went into the class, the students called her as "white delight" to make fun of her existence and to show they were not caring her authority, all of which led the teacher to leave the classroom. One of the participants expressed the scene about the teacher's first entrance into the class as below:

When the teacher first entered the classroom, everybody in class was singing a song, dancing, and nobody was care about the teacher. Although the teacher kindly asked them to be quiet, the students behaved as if she did not say anything. When the teacher asked them about their previous teacher, they exclaimed such negative sentences as "She is asking the big butt, I started to love that slut, Emilio ate her".

In addition, mobbing (n=19) and physical violence towards the peers (n=7) are considered as the most frequent themes. The actions included are calling the peers with the nicknames, swearing, threatening and calling down. Regarding *The Chaos Class*, one of the participants indicated "students are kidding and calling each other with nicknames which despise them"; e.g. Grind Şaban, a name of the student in the class. In *Dangerous Minds*, the participants stated:

Two students were fighting and Louanne, the teacher, tried to separate them by interfering the stronger student and told him to stop fighting due to his overpower. This caused more problems because in order to survive in that community, they had to fight better. Therefore, the intervention of Louanne was not a solution for this case but caused more problem between the students as she was not sensitive enough towards the cultural settings behind their fight.

The participants focused on that the teachers should act in a culturally sensitive way (Siwatu 2017). The teacher should know the values, i.e. the physical power, regarded in the context. In other cases, the teachers' interference cannot be accepted and taken into granted and even this can cause another fight outside the school.

The participants also explained all these misbehaviors started to decrease in *Dead Poets Society* and *Dangerous Minds* since John and Louanne drew the attention of the students to the content through their lesson planning. These movies supported the findings of the study conducted by Sanetti et. al (2018) that "the implementation of evidence-based classroom management strategies decreases the disruptive behavior of the students" (p. 57).

4. Conclusion and Discussion

The findings of this study are crucial for teacher educators as the online materials were considered more important during COVID-19. These materials should be designed to raise the awareness of the pre-service teachers towards the real-life classroom environments. The movies on education has become one of the main resources for the evidence-based classroom management training (Marquez et.al. 2016, Flower et. al. 2016 & Sanetti et. al. 2018). The analysis of three movies indicated that the participants of this study elaborately criticized *Dangerous Minds* more compared to two others. This is because it may be the most recent one among them.

In addition, it is fully agreed by the participants that Mahmut, Luoanna and John all are model teachers, who care about their students' needs, expectation, experience and future. The self-efficacy levels of these teachers are so high that they could manage these difficult classes and the students by focusing on the real problems related to the family, school and the student. Thus, it can be said that these teachers focus on the preventive strategies of classroom management, which provides the background behind the misbehavior (Bayraktar & Doğan, 2017). Okutan (2015) stated that the untrustworthy and over- authoritative classes are the main barriers in learning. They

all have empathy with the students, are achievable by them and affectionate towards them.

This study contributes into the field of teacher education on proposing movie on education as a tool for improving the classroom management skills of the pre-service teachers (Marquez et.al. 2016). The movies will raise their awareness on these skills and give them an opportunity of applying into the context (Girardet 2018, OECD 2018). Improving classroom management is essential for the pre-service teachers before they start professional life. The more secure they feel in terms of classroom management, the more confidence they can have and the better learning environment they can provide. Therefore, integrating the movies on education into the content of teacher education programs will be helpful during post-COVID-19.

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Appendix A

Table A1: Distribution of the Frequency of the Constructs According to the Movies

Constructs	Hababam Class	Dangerous Minds	Death Poets Society	TOTAL
Physical Constructs	86	35	30	151
Instructional Constructs	15	137	122	274
Human-based Constructs	107	120	76	303
Lesson Planning	10	125	92	227
Communication in Class	46	107	45	198
Undesired Behaviour	122	60	31	213
TOTAL	386	584	396	

Table A2: Movies and Constructs

Constructs	Sub themes	Frequencies	Total
Physical Constructs	Overloaded Classroom	17	37
	Large Classroom	10	
	Normal Size Classroom	7	
Instructional Constructs	Motivation	35	80
	Planning	23	
	Evaluation	10	
	Time management	7	
	Feedback	5	
Human-based Constructs	Parental pressure	19	74
	Student personality	17	
	Administrative pressure	16	
	Parental ignorance	13	
	Teacher quality	9	
Lesson Planning	Warming up	44	105
	Motivation	39	
	Assessment and Evaluation	16	
	Presentation	3	
	Revision	3	
Communication in Class	Teacher-student	35	86
	Student-student	29	
	Meeting	14	
	Knowing students' names	8	
Undesired Behaviour	Breaking the classroom rules	70	96
	Mobbing	19	
	Physical violence	7	

Conceptual Analysis of Twice Exceptionality*

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Abstract

The concept of twice-exceptional is used to define individuals who are gifted or talented in one or more domains while having disability, disorder or difficulty in certain areas. This situation has made the definition and acceptance of the concept difficult since giftedness and disability are mentioned together. In order to clarify current understanding of the concept, a conceptual analysis of the term "twice-exceptional" was conducted in this study using Rodgers' evolutionary concept analysis method. Firstly, the epistemological and ontological structure of the concept was discussed. It was seen that the concept was used in different terms in literature such as "twice exceptional", "dual exceptionality", "gifted with learning difficulties", "gifted handicapped". Instead of looking for an alternative term for the concept, existing studies were reviewed and the characteristics of the concept were tried to be revealed. Although the concept has been used for almost four decades, its implications date back to gifted studies addressing learning difficulties a century ago. It was later associated with Asperger's Syndrome, Attention Deficit and Hyperactivity Disorder, Autism Spectrum Disorder and other deficits. It was concluded that definition and characteristics of relevant concepts of twice exceptionality such as giftedness and disability have changed over time, which has also affected the evolution of twice exceptionality. Therefore, a clear definition or sharp boundary of the concept cannot be claimed, but its importance has been revealed by the field studies which also contributes to the further development of the concept.

Keywords: Twice Exceptionality, Gifted and Talented, Specific Learning Disability, Asperger's Syndrome, Attention Deficit and Hyperactivity Disorder

1. Introduction

1.1 Introduce the Problem

The first implications on the concept of twice-exceptional (2e) began in the 1900s with Hollingworth's coming up with a relation between giftedness and learning disabilities. Later, Asperger's syndrome (AS), described as a variant of Autism by Asperger, was included in the concept of 2e claiming that AS was likely to be seen in gifted children. This situation has led to discussions on whether an individual can have academically superiority together with deficiency, disorder or disability.

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While the discussion has continued over coexistence of giftedness and disability, its understanding, identification and characteristics; "The National Twice Exceptional Community of Practice" (2eCoP) developed a common definition of the concept of 2e in 2014. However, it is still not clear whether the concepts of intelligence and giftedness, which are constantly redefining, and deficiency or disorder in certain areas can be together with their own characteristics, so the conceptual confusion has not been resolved. The underlying reason is that the question of "What is the concept of 2e?" has not been explained, yet. A definition is formed by keeping the common qualities in many examples to be observed and discarding the non-common qualities. Therefore, every definition is an abstraction and the definition of each concept expresses its core. The core of the concept has an epistemological and ontological background. In order to reach the meaning of the concept, it is necessary to learn the historical background and concept phrases because the change in the phrases relating the concept effects the development process of the concept in its context. This situation paradoxically prevents a final definition of the concept, while revealing the richness of it in terms of content. The concept of 2e is a good example as the change in the concepts of intelligence and giftedness, the basic phrases of the concept, in the historical background has brought with the change in the concept of 2e. Therefore, in order to understand the concept of 2e, firstly it is necessary to clarify the concepts of intelligence and giftedness and then other relevant concepts such as autism spectrum disorder (ASD), specific learning disability (SLD) and attention deficit hyperactivity disorder (ADHD). In this study, associating concepts, various definitions and characteristics of the concept of 2e are reviewed and conceptual analysis is tried to be developed.

2. Method

The study was conducted using conceptual analysis within the qualitative research method. Conceptual analysis is the analysis of the data obtained from theoretical books, scientific articles, research papers and field studies considering the historical process of the concept, including the context of the concept, surrogate and related terms, the antecedents of the concept, its characteristics, examples and consequences related. Rodgers' evolutionary concept analysis method was used to analyze the data obtained from the documents in the study as it contributed to the clarification, definition and understanding of the concept within the discipline in which it was used by proceeding in a systematic and clear/simple manner in the analysis process, following a detailed process of explanation and carrying the inquiry process to a higher level (as cited in Chamberlain, 2015). In this inductive model, Rodgers argues that in the analysis of a concept, the concept may develop and change over time, but it can be handled without breaking away from the context in which it is originally used, and that the resulting analyses are not definitive results, but can only be guiding. In Rodgers' evolutionary concept analysis, it is first necessary to identify the concept that serves a human purpose, solves a problem or adequately explains the characteristics of a phenomenon. Then, by examining the surrogates terms, the distinctive features of the concept are tried to be revealed. For this purpose, an appropriate sample is determined by taking into account theoretical studies, interviews, researches, and various disciplines relating concept. Based on the sample, the characteristics of the concept are revealed. In this process, past events and phenomena related to the concept should be analyzed and the antecedents and consequences of the concept should be revealed. Although the last step of the model, in which other relevant concepts are also explained, is to define a model case of the concept, the main purpose is to provide a suggestion for future studies by asking questions and presenting hypotheses instead of reaching a final conclusion (Toftagen & Fagerström, 2010). Accordingly, in this study, the concepts related to 2e were discussed and clarified, the characteristics of the concept, its developmental process, antecedents were determined based on the knowledge obtained from the data sources, and an overall conclusion was presented that would develop knowledge in the field of 2e.

3. Results

The concept of 2e includes coexisting of giftedness and disability, paradoxically, having superior intellectual capability or talent along with at least one disability as mental, physical, psychosocial or other disorders such as AS/ASD, SLD and ADHD that lead to learning difficulties. In order to clarify this definition, it is essential to clarify the developments in the epistemological and differentiated ontological substructure of the concept of 2e so first and foremost the concepts of intelligence and giftedness are to be revealed.

It is seen that the first research on intelligence began in the second half of the 19th century with Galton's studies on intelligence. Galton, who almost ignores the effect of environment while emphasizing the hereditary characteristic of intelligence, argues that intelligence has an inherited structure and related to sharpness or sensitivity in the senses. Intelligence has gained a primitive identity with Galton's researches (Büyükcinal Göyçek, 2019). In the first quarter of the 20th century, Binet and Simon's intelligence theory and Terman's longitudinal studies on gifted students brought a different dimension to the concept of intelligence. Binet argues that intelligence has a so complex and multicomponent structure that Galton's definition of intelligence based on heredity and physical characteristics is inadequate to explain that complicated concept (Sak, 2010). According to Binet, intelligence has three basic characteristics: the ability to understand and keep an instruction in mind, the ability of easily adapting to a situation or performing the expected behavior, and the ability to judge through self-evaluation (Erdem, 2013). Binet claiming that the most reliable way of assessing the intelligence of individuals is psychological, emphasized that in order to measure intelligence, individuals should be classified in terms of their mental ability, rather than measuring simple characteristics such as weight and height. According to Binet, while one physician may diagnose a child as an idiot, another may identify as an imbecile or a moron; while one teacher evaluates intelligence according to school achievement, some others can notice a child who is unsuccessful but very intelligent. At that, Binet, in need of an objective measurement tool, develops the Binet-Simon scale ranked according to the degree of difficulty as a result of intensive research and experiments (Bolat, 2015). Binet and Simon define intelligence in terms of three different components: management, adaptation and judgement. Management is considered as deciding what needs to be done and how to do it skillfully; adaptation is the monitoring of the strategy chosen and used during the task; and judgment is the ability to criticize one's own thoughts and behaviors (Köksal, 2007). Terman, influenced by Binet, develops the first intelligence test in a way to distinguish gifted individuals and introduces the first standardized intelligence test called "Stanford-Binet Intelligence Scale" in 1916. In addition to intelligence test studies, Terman supports the literature through the long-term researches on students with high IQ (Alamer, 2017; Assouline et al., 2009). In a longitudinal study conducted by Terman, it is found that there is a relation between social adaptation, emotional sensitivity and cognition levels of gifted children (Gündüz, 2010; Terman, 1925). Attempts to measure intelligence objectively, which started with Binet, were developed with Terman by adding criteria to measure giftedness. Intelligence as a concept can be evaluated from different perspectives depending on the discipline, cultural context and scientific developments. Although it was first defined by emphasizing its hereditary characteristics based on its biological structure, today its complicated, multi-dimensional and developmental structure have been emphasized. This situation makes it difficult to make an ultimate definition of intelligence. As the concept of intelligence develops, the concept of giftedness also changes and redefines accordingly. This constant change in related concepts of 2e prevents a clear definition of it as well.

In a study conducted by McAlpine (2004) on the definition of giftedness, which is one of the main components of the concept of 2e, it is stated that there are two hundred and thirteen different definitions of giftedness. It is emphasized that this difference in definitions is based on the epistemological and cultural context of the time. In 1972 Marland Report was released in the United States, which is considered as a milestone in the field of giftedness. With its wide scope, the Marland Report is seen crucial for many areas concerning definition, diagnostic process, characteristics, psychosocial needs and education of gifted students (Jolly & Robins, 2016; Lindquist, 2006; Tagtmayer, 2017). According to the Report, the concept of giftedness and talent are used to describe individuals having superior performance and achievement or the potential in at least one of the six different areas of general intellectual ability, specific academic ability, creative or productive thinking, leadership ability, ability in visual and performing arts and psychomotor ability (Marland, 1972). In addition, the report emphasizes that there is a great risk for the states if gifted and talented individuals are not identified and supported with the appropriate educational services. The Marland Report's multidimensional approach to the concepts of giftedness and talent and the theorists' inclusion of factors such as environment and luck, which affect intelligence and talent, began to lay a foundation for the concept of 2e. Renzulli's three-ring conception of giftedness can be considered as one of these theoretical bases. Renzulli (1986) considers giftedness as a combination of above average ability, creativity and task commitment. According to Renzulli, a gifted individual has three sets of characteristics interacting with each other. While general ability includes word fluency, verbal and numerical reasoning, abstract thinking, selective recall of information and etc.; specific ability is the capacity of acquiring knowledge and performing in a specific area such as painting, dancing, play writing, statistics, chemistry, etc. Creativity as the second involves forming new ideas and using them to solve new problems. Task commitment is

the ability of undertaking and carrying out works through high level of dedication, enthusiasm, interest, perseverance, endurance and self-confidence. Traits in the creativity and task commitment rings are changeable and can be developed with appropriate education, whereas having above-average ability is permanent (Şentürk & Kefeli, 2019). Renzulli's (1986) giftedness and talented theory asserts that individuals cannot be identified as gifted or talented just because of academic achievement and IQ, but also having superior performance in task commitment and creativity. Having all the traits of any ring is not enough to be gifted but there must be interaction between and among the rings so that gifted behavior can emerge. Renzulli emphasizes that giftedness includes different variables other than IQ and also one can be deficient in some performance areas whereas very good at others. That can be seen as an important point that addresses the co-existence of giftedness and difficulty in the concept of 2e. After Renzulli, Gagne (1992) proposes a model that differentiates giftedness and talent. In his "Differentiated Model of Giftedness and Talent", Gagne does not see the concepts of giftedness and talent as equivalent and does not use them interchangeably. This model focuses on the development of talent rather than gifts (Smith, 2004). According to the model, gifts refers to innate and natural abilities that have developed without any intervention whereas talent refers to the systematic development of skills in a particular area. Gagne explains giftedness in four categories: intellectual, creative, social-affective and sensory-motor; and five categories of talent: academic, technical, interpersonal, athletic and artistic. The components of giftedness and talent were updated and a more detailed model emerged (Gagne, 2004). Furthermore, Gagne examines the success of gifted students who are in the top 10% of their class and attributes the stability of their success to the potential for continuous learning. From another perspective, Gagne claims that when academically gifted students are removed from their group, their achievement gradually decreases, regardless of the reason (Alamer, 2017; Büyükünäl-Göyçek, 2019). Gagne claims that a gifted child, who has a natural ability, is exposed to many factors that can affect him during his developmental process, and that he can develop his giftedness and transform it into talent through intrinsic motivation and environmental influences. Since Gagne sees giftedness as a natural ability or potential, he argues that children can maximize their potential through various interventions and experiences. Gagne's model also recognizes that chance is an important factor in the development of giftedness and other influences. He states that not all students have natural abilities, nor do they have the opportunity to access the proper interventions. Gagne's attitude emphasizes the importance of transforming intelligence into talent by recognizing the concept of 2e and preparing an appropriate educational environment for individuals. Finally, Tannebaum developed the "Sea Star Model" in the early 1980s, which, as expected, is based on the psychological and educational characteristics of gifted individuals. The Sea Star Model is explained in Tannenbaum's "Enriched Matrix Model". Tannenbaum argues that giftedness and talent should be identified within the educational process instead of first identifying and then educating gifted and talented individuals. This understanding is very important for the identification of 2e individuals. Because, as it is known, learning difficulties such as SLD and ADHD can mask giftedness and talent. Therefore, observations during learning process and cooperation between teachers and parents can be offered as a solution to the problems in the identification steps. In Tannenbaum's Sea Star Model of Giftedness, five factors must be present to be gifted: general ability, special aptitude, non-intellective requisites, environmental supports and chance factor. Each of these factors is necessary but not sufficient on its own to reveal giftedness. Therefore, the combination of four factors does not mean anything without the fifth one (Demirel & Sak, 2011). These five factors interact in different ways for different giftedness areas, but they all manifest themselves in a certain way in each giftedness area (Duman, 2013). According to Tannenbaum, environmental supports are important for the emergence of giftedness and talent. It should not be overlooked that the environment has a two-way effect; it has the potential to enhance giftedness and talent as well as to hinder or blunt it (Ercan, 2013). The concept of giftedness is not very precise and clear for Tannenbaum. This view stems from the lack of certainty in the tools and methods that identify giftedness. Tannenbaum also mentions other factors that contribute to this ambiguity such as the age of child, different special abilities, subcultural identity, and the future of individuals about whom there is no definite interpretation. Given all these uncertainties, the only thing that can be done is to evaluate the gifted child with his peers. Tannenbaum states that identifying the gifted and talented child is a process of getting to know him and for this reason he prefers to use the term "promising" instead of "gifted". However, he adds that promising individuals also arouse suspicion due to the previously mentioned uncertainties. According to Tannenbaum, one can hope for the future but never be sure (Leana, 2005). Having superior intelligence and talent, which is one of the prerequisites of the concept of 2e, has become a characteristic determined in the process with Tannebaum. In addition, the emphasis on the chance factor while identifying giftedness and talent along with some difficulties or disorders supports the comprehensibility of the concept of 2e.

As can be seen, each model has a multidimensional approach to the concept of giftedness and talent, which contributes to the enrichment of the concept of giftedness and talent discussed in the Marland Report. These models move away from one-dimensional definition based on intelligence scores and indicate that intelligence can emerge in cognitive, social, artistic or physical domains and should be considered multidimensional. In the meantime, the models emphasize the importance of studies relating environment, personality traits, and special abilities and interests of gifted and talented individuals, and also emphasize the possibility of difficulties and disorders in certain areas which points out the concept of 2e. It is known that the implication of the concept of 2e dates back to second half of the 19th century and theoretical studies in the field of giftedness and talent contribute to the understanding of it as well as revealing new dimensions.

In literature, "dual exceptionality", "gifted with learning difficulties", "gifted handicapped" have been used as surrogate terms of 2e although there is a conceptual difference among them. In this study, it is seen more meaningful to clarify the concept of twice-exceptional instead of looking for an alternative term as a concept is an ontic expression of the meaning.

The first implication of the concept of 2e dates back to 19th century and develop during 20th century. For the first time in 1923, the concepts of giftedness and learning difficulties were mentioned together by Hollingworth. Therefore, the first implication of 2e was limited to learning disabilities. Then, in 1944, with Asperger's syndrome, a different form of autism, it was claimed by Asperger that gifted children could also have AS along with their giftedness.

Thus, in the 1950s, the concept of giftedness began to be considered together with learning difficulties and Asperger's syndrome. These developments were detailed in the book "Providing Programs for the Gifted Handicapped" published in 1977 (Assouline & Whiteman, 2011). In the 1970s, legal regulations relating the concept of 2e began in the United States, for example, in 1975, the "Education for All Handicapped Children Act" was enacted and learning disabilities were explained, which can be seen as a step to understand 2e individuals in terms of disability, disorder or difficulty. The studies emphasizing not only intelligence scores but also environmental and chance factors in giftedness and talent theories paved the way for research on the concept of 2e during these years. Especially, between 1980-95, many researches on SLD and giftedness and talent were included in the literature. The first experimental studies on 2e individuals were officially initiated by John Hopkins University in 1981 (Buică-Belciu & Popovici, 2014). Owing to theoretical framework and field researches, the concept of learning disability was included in the "Individuals with Disabilities Education Act" (IDEA) in 2004, as well as it was indirectly mentioned the needs of 2e individuals. In 2014, the National Twice Exceptional Community of Practice was formed and a common definition of the concept of 2e was developed (Baldwin et al., 2015). The concept of 2e has been developed through the studies in the both special education and giftedness and talent areas so that collaboration of them is crucial in clarifying the concept of 2e, identifying students' needs and providing appropriate psycho-social and educational services. The historical development of the concept of 2e is summarized in Table 1.

Table 1: Historical development process of the concept of 2e

Year	Development	Impact on 2e
1923	Hollingworth published the book called "Special Talents and Defects: Their Significance for Education"	He coined the term "gifted". He stated that some gifted students could have learning difficulties
1944	In his article Autistic Psychopathy in Childhood, Asperger described a new personality disorder, later named Asperger's Syndrome.	He claimed that this syndrome was more likely to occur in gifted/talented children. Characteristics listed: overly elaborate speech content, disruption of two-way interactions, high-level logical abstract thinking, isolated interests, repetitive monotypic play, disregard for environmental demands.
1793	Elkind published "The Gifted Child With Learning Disabilities"	Introduced the term of "gifted children with learning disabilities".

1975	Education for All Handicapped Children Act was passed	Free and appropriate education became compulsory for all children with disabilities. The definition of "learning disabled" was included.
1978	The Gifted and Talented Education Act was passed	A department for the gifted and talented was established at the National Institute of Education. "Giftedness" was defined. Gifted behavior occurs in specific people, at specific times and under specific conditions. He noted that bright children with academic, attention and social difficulties often show this behavior when they are engaged in an area of interest or talent.
1978	Renzulli defined giftedness as above-average ability, creativity and commitment to task.	
1980-2000	Educational programs for gifted students with learning disabilities have been developed in USA.	Programs were developed to meet the educational needs of gifted and talented students with learning disabilities in different fields.
1984	Initiated federal projects and state grants	Jacob Javits Grants: 2e Children Project, Great Expectations Project, etc. It was recognized that students with learning disabilities may also be gifted and talented. To identify these students a problem-solving approach with comprehensive teamwork and the use of multiple data sources were encouraged.
2004	The Individuals with Disabilities Education Act (IDEA) is reinstated.	
2014	National Twice Exceptional Community of Practice was established	A common definition of the concept of 2e was developed with the cooperation of academics and educators working in the field of 2e.

Source: Baldwin et al., 2015.

In the first definitions of 2e, a gifted child who has a learning disability is defined as 2e (Klingner, 2022). According to the common definition developed in 2014 by 2eCoP, the concept of 2e is explained as individuals showing giftedness or talent in one or more areas, while showing deficits or having difficulties in one or more areas (Neihart, 2008; Ömür, 2019). The concept of 2e includes having one of the disabilities such as AS, SLD, ADHD, emotional/behavioral disorder, speech and language disorder, physical disabilities along with giftedness and talent (Yenioğlu & Melekoğlu, 2020).

2e individuals are commonly known as having giftedness and at least one disability, deficit or disorder that makes gifted students also have learning difficulties and prevents fulfilling their high potential (Buică-Belciu & Popovici, 2014; Neihart, 2008; Nielsen, 2002). The development of the concept of 2e has been highly influenced by the researches revealing gifted students cannot always show superior academic performance and also have difficulty in learning because of coexisting disability. SLD is one of the most common difficulties among gifted students. It is defined as difficulties in listening, thinking, speaking, reading, writing, and performing mathematical calculations, which are caused by the influence of one or more psychological processes that are fundamental in understanding and using written and spoken language (IDEA, 2004). It is very difficult to make a full list of common characteristics of students having SLD because each individual differs in terms of personal traits and can have a unique set of patterns (Yenioğlu & Melekoğlu, 2020). However the most basic characteristic of this group is that they have normal or superior intelligence capacity but significant difficulties in academic areas, specifically in reading and writing (Alamer, 2017). Gifted individuals with SLD are defined as having difficulties in one or more of certain areas such as reading, writing, and mathematics, while they are identified as gifted or talented owing to high performance in at least one specific domain (Boothe, 2010). In recent years it has become widely accepted and understood that gifted individuals may also have SLD (Brody & Mill, 1997).

In the historical development of the concept of 2e, after Hollingworth's findings on gifted children's asynchronous development which could be appeared as having learning difficulty despite high intelligence capacity, first 2e discussions got started. Shortly after, as a new disorder Asperger's syndrome was defined and it was claimed that

it was also possible for gifted students to have that syndrome. This has led to the expansion of the definition of the concept of 2e. AS can be a clinically complex, chronic neurodevelopmental condition when it is associated with 2e. AS is mainly considered within ASD but the main distinguished feature is that there is no delay or regression in language and cognitive development in AS as in ASD (Girli, 2007). Gifted individuals with AS may exhibit emotional maladjustment, pedantry, excessive focus on special interests, attention deficits or certain sensory characteristics due to AS (Reis et al., 2021).

Another concept that has recently been associated with 2e is ADHD, which is one of the most common neurobehavioral disorders in childhood and can profoundly affect children's academic achievement, development and social interaction (American Academy of Pediatrics, 2019). In the DSM-IV-TR, the American Psychological Association lists common characteristics of children with ADHD as: problems with sustaining attention, daydreaming, difficulty listening attentively, difficulty with task adherence and following tasks, lack of attention to detail, difficulty with organization and time management, difficulty sitting still, talking too much, and often interrupting others. Gifted individuals with ADHD may exhibit characteristics such as difficulty in switching to another subject when they pay attention to one subject, untimely movement and speech, boredom and rejection of routines, inability of social adaptation, stubbornness, working memory deficits and less systematic thinking (Kargı & Akman, 2003; Sayı, 2018; Webb & Latimer, 1993). Correspondingly, the situation of 2e individuals' having giftedness together with a difficulty/disorder or disability such as SLD, AS or ADHD make the concept of 2e incomprehensible and cause ongoing ontological and epistemological discussions. While some studies in the literature claim that giftedness, talent and disability in certain areas are incompatible, on the other hand, many studies emphasize that these two conditions can coexist paradoxically in a 2e learner (Alamer, 2017).

After the first empirical researches at John Hopkins University, Foley-Nicpon et al. (2011) conducted a comprehensive study on 2E individuals and found that gifted and talented students could have a disability, difficulty or disorder at the same time. Similarly to these findings, the recent studies have also contributed to the understanding of the differences and complexity experienced by 2e students in their academic, social and emotional life (Baum & Owen, 2004; Foley-Nicpon et al., 2011; Trail, 2010). Furthermore, Jarosewich and Stocking (2002) made a research with 1762 gifted children and concluded that 3.1% of them had also ADHD. According to Chae, Kim, and Noh's (2003) study 9.4% of gifted children had ADHD. Minahim and Rohde (2015) found that this rate increased to 3.8% in gifted adults and 15.38% in gifted children. Based on previous studies, Antshel (2008) statistically inferred that 10% of individuals with ADHD are also gifted (Sayı, 2018). On the other hand, there are also studies in the literature that accept that giftedness, talent and disability in any field cannot be together. In addition to these discussions, studies in the literature emphasize that there are major problems in the identification of 2e children (Klingner, 2022; Lindquist, 2006). Until 2000, many researchers expressed their concerns that giftedness was often misdiagnosed as ADHD and at the same time the diagnosis of ADHD was almost non-existent in gifted individuals (as cited in Kaufman et al., 2000; Tucker & Hafenstein, 1997; Webb & Latimer, 1993). These concerns are based on the understanding that when giftedness is dominant, difficulties or disabilities may be masked and when difficulties are dominant, giftedness may not emerge because of the masking effect. In the third case, giftedness and difficulties may mask each other at the same time and so neither giftedness nor disabilities and difficulties may not be diagnosed (Lindquist, 2006). Most of the symptoms shown by gifted children and children having only ADHD are similar. For example, a student identified as 2e because of giftedness and ADHD tends to get bored quickly with simple academic tasks, move on to another without completing his task, and not focus carefully on the instructions or details. Functional impairments resulting from ADHD can overshadow the high potential and success of gifted students. Even if the failure of them are understood, they are often labelled as "being spoiled" or "not working hard enough". However, in some cases, the lack of focusing at learning process can be tolerated through rapid learning as a characteristic of giftedness. This is also the case for students who have giftedness with SLD and AS, as well. It is stated in the literature that many gifted students with SLD cannot be identified at the appropriate time (Brody & Mills, 1997; Foley-Nicpon et al., 2011). Even though these 2e students may not be unsuccessful, mostly, they do not feel successful enough because they cannot reveal their potential sufficiently and reach their expectations (Madjar & Manor 2020). As there are problems in the identification of 2e students, the tendency to make diagnoses based on performance or IQ scores causes this problem to grow, which make it more difficult to provide an overall framework about the concept of 2e.

The common characteristics of gifted students without any disability and gifted students with SLD, ADHD and ASD/AS, which are mostly seen in 2e, are listed in Table 2 in terms of a academic ability, attention, organizational skills and their social, behavioral and emotional issues. To notice these characteristics can contribute to recognize and identify 2e students and also reduce the confusion to some extent.

Table 2: Characteristics of 2e Students

	SLD and Giftedness	ADHD Giftedness	and	ASD/AS Giftedness	and	Giftedness
A c a d e m i c Q u a l i f i c a t i o n s A t t e n t i o n P r o b l e m s	Difficulty in reading despite early verbal development Disgraphics Dyslectic Dyscalculia Problems with short-term memory Strong in critical and creative thinking in-depth knowledge in the Specific interests Preference for spatial tasks	Difficulty starting, following or completing a task Strong in critical and creative thinking Preference for spatial tasks		Appropriate cognitive development without language delay Difficulty in understanding abstract concepts and tasks that require critical and creative thinking Preference for spatial tasks Preoccupation with one or more uniform and restricted types of task		Rich vocabulary, Fast reading skills Early reading tendency Powerful memory Higher level thinking and problem solving skills Power of conceptualisation, synthesis and abstraction
	Short attention span and rapid distraction Excessive movement, inactivity or apathy	Inability to stay still, fidgeting, constant movement Difficulty staying still Rapid distraction		Specific or repetitive movements Persistent preoccupation with parts of objects		Long attention span in areas of interest Distraction in early boredom due to fast learning

Organisations	Difficulty understanding and following instructions				
	Difficulty in expressing thoughts verbally and in writing	Difficulty in following and completing instructions		Rigid adherence to dysfunctional routines or rituals	Following and finishing instructions quickly and easily
	Difficulty doing work when there is no structure or predictability (non-verbal learning disability)	Difficulty in time management			Detailed and creative thinking
Social Issues				Social in interaction quantitative deterioration in (at least two ways)	
				Lack of non-verbal behaviour	Developed sense of humour
	Problems reading in a social context (non-verbal learning disability)	Difficulty in making sense of subjects in their social context		Peer relationship failure to develop	Ability to communicate well with parents, teachers and other adults
				Lack of sharing spontaneous interest or happiness or achievements	High sense of responsibility
Social Issues				Lack of social or emotional interdependence	

The table was adapted from “An operational definition of twice-exceptional learners: Implications and applications” by Reis, Baum and Burke (2014) and characteristics of gifted students were added.

Table 2 lists the typical characteristics of gifted students with SLD, ADHD, ASD/ASD under certain headings. This situation reveals the conceptual complexity of the concept of 2e in the identification process. In addition, the fact that a student shows superior intelligence/giftedness in one or more areas while at the same time showing inadequacy and having difficulties in one or more areas makes it difficult to identify the situation, define the concept and intervention methods. However, as can be seen in the table, some features are intertwined with each other or too difficult to comprehend. While a gifted student can complete a task faster than his peers and have the ability of detailed and creative thinking, a gifted student with ADHD or SLD may have difficulty in understanding and completing instructions or may not be able to express his thoughts verbally or in writing. Therefore, the general assumption that a gifted student is competent and successful in all areas ignores the possibility that students with deficiencies or difficulties in some aspects may also be gifted. From another view, the failure of a student identified as gifted is attributed to not paying enough attention or being spoiled. Gifted students are usually aware of this failure and may feel social and emotional inadequacies in addition to academic problems. Therefore, first of all it is necessary to understand the concept of 2e and the common characteristics of 2e students, and then develop comprehensive and multifaceted identification procedures and tools.

4. Discussion

The concept of 2e was analyzed in the context of ontological and epistemological developments. An in-depth national and international literature review on the concept of 2e was conducted. It has been determined that there are discussions about the concept in line with the recent developments in the literature. In this study, an ontological description has also been made along with epistemological review of the concept. The discussions in the epistemological process starts with the question "What is 2e?" and this is followed by the ontological questions such as "Is it possible to be 2e? If so, how can it be defined?". In this process, each question about the concept is divided into sub-questions. First of all, a common definition of the concept of 2e in the literature has been used as the answer of first question. In order to review the discussions in the literature, the nature of the concept of 2e is emphasized based on its definition. It is determined that the most important discussions about 2e is whether there can be any difficulty, disorder or disability together with giftedness. It has been stated in many experimental researches that paradoxically, despite their high cognitive capacity, gifted students can experience deficiencies and difficulties in some areas such as academic, social, behavioral or emotional due to their asynchronous development. For all that, it is not clear enough that the same questions, "Is it possible to be 2e? If so, how can it be identified", remain to be answered. Actually, because of the masking effect the students are identified according to their main domain and the other side is usually overshadowed but when both the giftedness and disability areas are similarly dominant, both can mask each other and neither the giftedness nor any disability can be revealed all their life. Thus, it has been concluded that the concept of 2e is not comprehensible and clear enough in spite of a common definition and many research findings. Another reason that makes the concept of 2e complex and confusing is the theories and definitions of giftedness and talent. While every single development of gifted theories enriches and supports and the understanding of the concept of 2e, paradoxically, it also causes the same questions to be asked over again and made a new definition, which leads to a new confusion. Regarding the concept of giftedness and talent, the multidimensional definition in the Marland report and the theories of intelligence contributed to develop that main definition are discussed. It is seen that the theoretical studies of Renzulli, Gagne and Tannenbaum about giftedness and talent have diversified and enriched the studies on the concept of 2e.

The fact that the concepts of giftedness and talent, correlating with the concept of 2e, and the areas of disability, disorder or difficulty such as SLD, ADHD and AS are in constant development, in other words, the dynamic structure of each concept that constitutes 2e, which is open to new developments, enables the enrichment and development of the concept of 2e; on the other hand, paradoxically, it leads to confusion and constant redefinition of the concept. If the concept had a simple content in itself, it would be expected a clear and final definition would be made and the definition would be comprehensible but the concept of 2e has to be defined over again depending on the developments in its background. As long as the concept of giftedness and talent are not clarified, the definition of 2e cannot be sufficiently understood, but it needs to be accepted and recognized.

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Examination of the Opinions of the Parents Attending the Safe Internet and Computer Using Course on Applied Education^{*}

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Abstract

Individuals may encounter many negativities due to the misuse of computers and the Internet. Children suffer the most from these negativities. This situation necessitates parents who always protect and stand by their children, to become knowledgeable about the safe use of computers and the Internet. In this study, we examined the opinions of the parents who participated in the safe Internet and computer use training for the parents. The participants of the study were 14 parents of students studying in the 5th and 6th grades in a state secondary school in Bartın. The data of the research were obtained using a semi-structured interview form and a personal information form including demographic characteristics. Qualitative method was used in the research and content analysis was used to analyze the data. In the research findings, the views of parents on safe computer and safe Internet use were examined. It is seen that the general purpose of the parents participating in the training organized on safe Internet and computer use is to improve themselves. When the aims of parents' participation in education are examined; there are reasons such as obtaining information about safe Internet use and completing their deficiencies, learning to use a computer, helping their children and adapting to technology. At the end of the training, the parents stated that they learned about password security, mobile security, the points to be considered in sharing information (such as sharing personal information), harmful software, the use of anti-viruses and the benefits of safe Internet use at the end of the training.

Keywords: Safe Internet and Computer Use, Information Security, Education of Parents, Lifelong Learning

1. Introduction

Today, both the scope of information and the developments in information and communication technologies (ICT) are changing rapidly and spreading in a short time. This change has had many positive contributions (Kara, 2011). However, besides the benefits that ICT has added to our lives, there are also disadvantages (Baaij, 2012; Chusavitina & Zerkina, 2016). Some human-induced problems may be encountered due to the inability of individuals to use ICT correctly (Arachchilage & Love, 2014; Shillair et al., 2015). While it is critical for

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individuals to reach the right information quickly and on time with the effect of the Internet, the elements that may threaten the information security are gradually entering our lives. The weakest link in ensuring information security is the human factor. The human factor plays a key role in ensuring an adequate level of information security (Mart, 2012). In cases where information security is compromised, loss of privacy, cyber threats and attacks are just some problems that may arise. In addition to the fact that attacks can come from malicious people in electronic environments, there are threats called social engineering that can come from our friends and people we know (Canbek & Sağiroğlu, 2006). Because of these problems, individuals suffer material and moral loss (Karaoğlu Yılmaz, Yılmaz, & Sezer, 2014). Additionally, it brings many problems arising from the frequent use of computers and the Internet (Cengizhan, 2005). The widespread use of the Internet and mobile phones among students indicates that students communicate in cyber environments, and the communication established in these environments naturally led to the emergence of a new type of bullying called cyberbullying (Özdemir & Akar, 2011; Walvare & Heirman, 2010). Additionally, since the threats encountered increase in terms of both number and variety, ensuring the security of the information carried in mobile electronic environments comes to the fore (Bulut & Sağiroğlu, 2009). The use and protection of passwords in personal computers, social networks, e-mails or in all electronic media is also of vital importance in preventing information security risks.

According to Bilen, Ercan and Gülmez (2014), personal information, picture, video, content and profile sharing, etc. With the easy use of social networks that emerged for these purposes, users have attracted considerable attention, and both the number of these applications and the number of their users have increased, and their spread has accelerated. Social networks have now become one of the basic communication tools of individuals of all ages. All children, including primary school students, use social networks for various purposes such as communicating with their friends, playing games, and communicating with their teachers (Yorgancı, 2018). However, social networks can also have some disadvantages. Identity imitations can be made on social networks, as well as fake accounts can be opened on behalf of users. Additionally, added photos or videos can be used in other accounts for different purposes without permission (Yıldırım & Varol, 2013). Additionally, the reasons for security vulnerabilities in social networks can be expressed as non-compliance with privacy principles, the fact that users do not know how to control it, and users make themselves targets in this environment by sharing their personal information (Yavanoğlu, Sağiroğlu, & Çolak, 2012). For this reason, it is necessary to take some security measures to be protected from the negativities that may occur in social networks.

The Internet, which is an important technological development today, enables individuals to obtain the information they want in a short time, to communicate and to do many things in a short time. Additionally, the number of sites that can cause children to be adversely affected is increasing day by day. It is the duty of families to protect their children from the effects of these negative websites on the Internet.

Families must inform children about the safe use of ICT, democratically, for children to use the Internet correctly, to raise awareness of the dangers waiting for them in the Internet environment (Ayas & Horzum, 2013). Because when children face any problem, they cannot find a solution on their own and may need help. Here, they should first be able to apply to their closest parents and get information. However, when parents see themselves as technologically disadvantaged compared with their children, they cannot help their children (Smith, 2007). When the use of the Internet started to become widespread in our country, parents initially welcomed the Internet connection at home, as they thought the Internet was an interesting tool that offered new educational opportunities for their children. However, afterward, most parents realize that their children do not use the Internet for homework or research; in contrast, they realized that they spent time playing digital games, instant messaging, chatting with strangers (Yalçın, 2006). Today, childhood and adolescence spent completely away from technology cannot be imagined, and childhood spent with technology at any time may have developmental drawbacks (Akbulut, 2013). Considering this situation, it is not the right approach to ban the Internet, which is an important part of our lives, for our children due to the dangers in its structure, like any technology, and to deprive them of the possibilities of this technology. According to Kaya and Tuna (2010), the children of families who do not spend enough time with their children regardless of their education level, cannot guide their children in the safe use of ICT and do not have sufficient knowledge about these issues, are likely to spend more time with these technologies and perform undesirable behavior. Therefore, it is critical to educate parents on this issue. As a family, the first step to protect our children from the dangers of the Internet is to learn to use this technology at a basic level (Tercan, Sakarya, & Çoklar, 2012). In this respect, it is critical for parents to have sufficient information to provide correct information

to their children and to protect their children from risks (Karaoğlu Yılmaz & Çavuş Ezin, 2017). The attitudes of the parents toward technology and the attitudes taken by the parents toward the technological developments directly affect the children (Odabaşı, 2005). Because the attitudes and behavior of parents have an important place in the formation of children's attitudes. The family environment in which the child is born and the characteristics it has played an important role in determining the development of the child (Kenar, 2012). Within the scope of the European On-Line Children Research Project (EU Kids Online II, 2010) realized with the participation of 25 European countries and supported by the European Commission, interviews were conducted with children aged 9–16 across Turkey and their parents, and children's Internet use and Internet risks were examined. Because of the EU Kids study is among the suggested that parents should be educated about Internet safety so that parents can use the Internet as a solution proposal, although they think that they have enough knowledge about Internet safety, but they do not have enough knowledge and skills. From this viewpoint, to use ICT, which we come across at every stage of our lives and make our work easier, the parents, who are right next to our children and are a model for them, should receive the necessary training and help their children.

It may not be possible to handle every situation encountered on the Internet. For this purpose, internet literacy skills should be at a certain level (Çelen, Çelik, & Seferoğlu, 2011). According to Canbek and Sağiroğlu (2007), if a parent must know where their child is outside the house alone and with whom, they should also be controlled at the computer and on the Internet, and families should have enough knowledge about the subject to guide their children.

Akkoyunlu and Tuğrul (2002) in their study aimed to determine the effect of preschool children's interactions with various technological devices at home on their computer literacy stated that children are with technological tools from an early age, and that parents' approaches affect children. Additionally, he states that the strong models presented by the parents and the conscious guidance affect all stages of the child's development positively, and that the conscious guidance of the parents is critical to expand the impact of technology positively and to eliminate the possible problems that may be caused by its uncontrolled use. Here, since it is impossible for all individuals to adapt to development and change only with the knowledge learned during school periods, it is possible for the person to constantly renew and develop himself only through lifelong learning. In modern society and education system, the skills to use ICT have become a basic requirement for lifelong learning (Yılmaz & Karaoğlu Yılmaz, 2018). Besides lifelong learning, schools and universities; it can be done at work, at home, or anywhere, without any restrictions in terms of age, gender, socio-economic status and education level (Ministry of National Education [MEB], 2009). According to Miser (2002), in today's world where information and skills are constantly changing, everyone should renew and develop themselves by using adult education services. In particular, he stated that what is expected from adult education is to adapt individuals to the developing technology. From this perspective, the proximity of adults to technology is even more important. In this direction, considering the studies in the literature, it is seen that parents do not have enough information to guide their children about safe ICT use and information security and to raise awareness. The education of parents becomes necessary. This study is important in terms of providing the parents with education to be conscious individuals and thus having the knowledge to inform their children against the threats that may arise in front of the Internet and computer.

1.1. Purpose of the research

In the research, parents were given safe computer and Internet usage training and their opinions were examined because of this training. With this study, it is aimed that parents become life-long learners by ensuring that they have the knowledge to inform their children about the threats that may arise in front of the Internet and computers. When the studies in the literature are examined, it is seen that children face various negativities, but families cannot help their children because they do not have enough information on this issue, and it is thought to raise awareness for parents as suggestions. For this reason, this study is important in terms of both contributing to adult education and helping to eliminate the negativities that our children may encounter by providing safe computer and Internet usage training to parents in the lifelong learning process.

2. Method

2.1. Model of the Research

This research is a qualitative study to determine the opinions of the parents after the safe Internet and computer use training given to the parents. Qualitative research is research that uses qualitative data collection methods such as observation, interviews, and document analysis and reveals perceptions and events in a natural environment in a realistic and holistic way. (Yıldırım & Simsek, 2016). In this study, a case study, one of the qualitative research designs, was used. The purpose of most case studies is not to observe the research group and find generalized conclusions; to understand the distinctive features of the research group is to reveal the attitudes and behavior against an event by systematically explaining them (Özden & Durdu, 2016).

2.2. Working Group

The participants of the research; consisted of the parents of the students studying in the 5th and 6th grades in a public secondary school in the province of Bartın in Turkey in the fall semester of the 2017–2018 academic year. Since the compulsory information technologies and software courses are included in the curriculum in the 5th and 6th grades, the parents of these students were included in the study group. 14 volunteer parents participated in the study.

2.3. Data Collection Tool

The data of this research; personal information form and semi-structured interview form, which was finalized by obtaining expert opinion. In the personal information form, questions are prepared to determine the demographic characteristics of the parents, such as gender, age, occupation, marital status, educational status. However, in the semi-structured interview form, there are questions in which the parents will express their personal opinions about education organized.

2.4. Data Collection and Analysis

Personal information form and semi-structured interview form, which are data collection tools, are available in printed form. After the training was given, the parents' views on the training on "Safe Internet and computer use" were applied to 12 parents via audio recording and to 2 parents who did not accept the audio recording on paper. In the analysis of the data obtained through open-ended questions, the content analysis technique was used as the researcher would reveal the codes. Content analysis increases the intelligibility of the research phenomena by coding the data and bringing them together under certain themes (Yıldırım & Şimşek, 2016). The research findings were based as the theme based on the semi-structured interview form questions and presented by creating sub-themes from the answers given by the participants to the interview questions. Sentences that were thought to be used as one-to-one quotations were determined and included as one-to-one quotations in the findings section when deemed necessary. Additionally, the frequency of the sub-themes was calculated and tabulated in frequency. The frequency values given in the study show the frequency of repetition of sub-themes, not the number of people. The data obtained in the study were recorded by the researcher, and then by a second encoder for the reliability of the study.

Miles and Huberman's (1994) reliability formula: Concordance rate = Number of coding codes that were adapted/Number of codes that were or could not be matched. A 70% agreement was considered acceptable. This gives coding reliability. Inter-coder reliability was found to be 93.03%.

2.5. Organization and Content of the Training Given

The training given to parents on safe Internet and computer use is given below under the main headings:

1. Information Security

- Malware
- Password Security
- Security in Social Networks
- Social Engineering
- Network Security
- Mobile Security

2. Why Is Safe Computer Use Important?
3. Let's Recognize the Risks Children May Encounter on the Internet.
4. Cyberbullying
5. Precautions and Solutions to be Taken for Safe Use as Parents

3. Findings

The findings and comments obtained from the research are presented below, respectively.

3.1. Findings on Demographic Characteristics

Coding was done to present the data obtained from the parents without revealing their identities and not to cause confusion. For this purpose, codes were given as P1 in the order in which the data were entered, and as “P2,” “P3,” “P4” ... “P14” respectively.

Table 3.1: Demographic characteristics of the parents participating in the study

Gender	f	%
Female	12	85.7
Male	2	14.3
Level of Education	f	%
Primary School	5	35.7
Secondary School	4	28.6
High School	5	35.7
Bachelor	-	-
Graduate School	-	-
Age	f	%
30–34	7	50
35–39	3	14.3
40–44	2	7.1
45 ve üstü	2	7.1
Professions	f	%
Homemaker	10	71.4
Self-Employment	2	14.3
Operator	1	7.1
Retired	1	7.1
Total	14	%100

As shown in Table 3.1, female parents participating in the research constitute 85.7% (f=12) of the participants, and male parents constitute 14.3% (f=2). The educational status of the parents was 5 primary school, 4 secondary school and the remaining 5 high school graduates; it is seen that the number of parents who graduated from primary, secondary and high school is close to each other.

Looking at the age distribution, it is seen that 50% of the parents are between the ages of 30–34. It is seen that the number of parents participating decreases as the age increases. When the table is examined, parents who grow up in the age of technology and who are younger are more interested in education for the use of ICT. It could be seen that most of the participants were homemakers. It can be seen that the other parents were (f=2) self-employed, (f=1) retired and (f=1) operators.

Table 3.2: Distribution of the parents participating in the study according to their possession of ICT tools

Availability of ICT Tools	f	%
Smartphone	14	100
Desktop	7	50.0
Tablet PC	5	35.7
Laptop	2	14.3
Do not own any ICT tools	-	-
Availability of Regular Internet Access	f	%
Yes	14	100
No	0	0
Average Daily Internet Usage Times	f	%
0-1 hours	8	57.1
1-4 hours	5	35.7
4-7 hours	0	-
7 h or more	1	7.1
Do you use social network? (For example, Facebook ...)	f	%
Yes	11	78.6
No	3	21.4
Do you use any anti-virus programs?	f	%
Yes	9	64.3
No	5	35.7
What is the meaning of lifelong learning? Explain it	f	%
Learning will continue from birth to death	12	85.71
Improve yourself throughout the life	1	7.14
Get information continually	1	7.14
Total	14	100

When the parents participating in the study had ICT tools, it was seen that everyone has a smartphone. The presence of smartphones for every parent can show that individuals have kept up with the digital age. It seems that everyone has regular Internet access. It was determined that 78.6% (f=11) of the parents used social networks and

21.4% (f=3) did not use social networks. Considering the use of antivirus, it is seen that 64.3% (f=9) of the parents use antivirus program and 35.7% (f= 5) do not.

It can be seen that most of the parents participating in the study could explain the concept of lifelong learning. Some of the parents' opinions are given below.

P3: "There are many things to learn as long as our lives go on. I continue to learn. I will continue."

P6: "It is never too late to learn. We need information at every age, and it is more efficient when it is done knowingly."

P9: "I think a mother should learn everything she can learn in life and should be a model for her children."

3.2. Findings Related to Research Questions

The findings and comments obtained for the research are presented as follows.

The answers to the question of the factors or factors that enable the parents who participated in the training organized on safe Internet and computer use to participate in this training (Self-development, contributing to professional development, socializing, closeness of the course, to adapt to technological developments, etc.) are shown in Table 3.3.

Table 3.3: Elements that enable you to participate in the training organized on safe Internet and computer use

Sub-themes	f	%
For improving myself	11	28.20
For helping my child	7	17.94
For adapting new technologic improvements	6	15.38
To socialize	6	15.38
For getting information and fixing the shortcomings	3	7.69
Contribute to professional development	2	5.12
To help the environment and friends	2	5.12
As it is useful	1	2.56
As it is close to the course	1	2.56
Total	39	100%

When Table 3.3 is examined, it is seen that 28.20% (f=11) of the answers given by the parents who participated in the training organized in safe internet and computer use for the factors that enable them to participate in the training is self-improvement. Here, it can be said that most parents are lifelong learners. It is seen that 17.94% (f=7) of the answers were to help our children, 15.38% (f=6) to keep up with technological developments and 15.38% (f=6) to socialize.

Some of the parents' opinions are given below:

P8: "I think I will say many elements. I especially wanted to be useful to my child, I developed myself, I socialized, I wanted to adapt to other technologies."

P14: "It was self-development, keeping up with technological developments, helping our children."

P3: "for my child to socialize and improve myself"

The answers given to the question stating what kind of benefits the education received by the parents are in terms of ensuring information security are shown in Table 3.4.

Table 3.4: Benefits of the training given to ensure information security

Benefits of the training given to ensure information security	f	%
Password security (Password usage etc.)	9	19.56
Mobile security	7	15.21
Things to consider when sharing information (Personal information should not be shared etc.)	6	13.04
Backing up information	5	10.86
Usage of social networks and security	5	10.86
Usage of safe internet	3	6.52
Malware and usage of antivirus	3	6.52
Correct use of flash memories	2	4.34
Every downloaded file should not be used	2	4.34
Usage of public wi-fi	2	4.34
Protection against risks on the Internet, such as cyberbullying	2	4.34
Total	46	100%

When Table 3.4 is examined, 19.56% (f=9) of the parents' answers to the benefits of the training in ensuring information security are password security, 15.21% (f=7) mobile security, 13.04% (f=6) information sharing things to be considered (such as sharing personal information). Additionally, (f=3) malicious software, use of antivirus and (f=3) safe Internet use were mentioned as the benefits of education. Parents stated that they benefited from this training in terms of password security, mobile security and information sharing.

Some of the parents' opinions are given below.

P5: "I think it is useful in providing information security, in mobile security, in smartphones, in password security, when passwords are used everywhere."

P8: "Thanks to the training I received, I learned that information security is beneficial for many things. Most importantly, I was not using a password. I learned to use a password. I learned how to ensure mobile security. I learned how to use passwords. I was using a very simple password in some places. And I learned that it was bad and in a safer way."

P10: "we should not share our information with anyone, that we should back up the information. I also realized that mobile security issues are even more important in social networks."

Table 3.5: Benefits of safe Internet and computer use training

Benefits of safe Internet and computer use training	f	%
This enabled us to help our children with lessons	5	13.88
To be able to recognize the risks that our children and we will encounter on the Internet and precautions to be taken.	5	13.88
Ensuring information security	4	11.11
Safe computer usage	3	8.33
Ability to follow new technological developments	3	8.33
Learning malware	2	5.55
Safe Internet usage	2	5.55

Improve yourself	2	5.55
Ability to protect our personal computer	2	5.55
Recognizing cyberbullying	1	2.77
Socializing	1	2.77
Checking whether sites are trustworthy or not	1	2.77
Enabling us to obtain information	1	2.77
Rely on yourself	1	2.77
Enabling us to control our children's internet usage	1	2.77
Ensuring safe social media usage	1	2.77
Saving time using the internet (placing an order, finding recipe etc.)	1	2.77
Total	36	100%

When Table 3.5 is examined, it is seen that 13.88% (f=5) of the answers given by the parents about the benefits of education provided enable us to help our children in the lessons, and 13.88% (f=5) provided them to realize the risks that our children and we will encounter in the Internet and the precautions to be taken. 11.11% (f=4) of the answers stated that they provide information security, 8.3% (f=3) stated that they can follow technological developments closely and 8.3% (f=3) stated that they use secure computers.

Some of the parents' opinions are given below.

P2: "I think it is beneficial for both myself and my child. For my child's lessons, for Facebook, for social media."

P8: "I was casually accessing the Internet, at least now I learned how and in what way, it was very useful for not harming myself and my computer."

P12: "Information security, keeping up with technology, what should be considered when using a computer, how do we protect our children."

Table 3.6: Parents' ability to contribute to their children's safe Internet and computer use because of this training

Because of this training, how will you contribute to your children's safe Internet and computer use?	f	%
Enabling and observing our children's internet usage under control	5	17.24
Providing our children with the opportunity to help with what we have learned in case of need	5	17.24
Ensuring them that they prefer age-appropriate and reliable sites	4	13.79
Protecting our children against the risks they face on the internet	3	10.34
Usage of social media	3	10.34
Using a secure password	2	5.17
Providing information on malware	2	5.17
Helping to cope with cyberbullying	2	5.17
Understanding the importance of using a computer	1	2.58
To have knowledge with reliable education	1	2.58

Being able to teach password creation criteria	1	2.58
Total	29	100%

When Table 3.6 is examined, it is seen that 17.24% (f=5) of the answers given by the parents on how they can contribute to safe Internet and computer use for their children because of this training is that they can provide the opportunity to control and monitor their children's Internet use, and (f=5) to help their children with what they learn when needed. Additionally, 13.79% (f=4) of the answers expressed their contribution to their children as making them prefer age-appropriate and reliable sites.

Some of the parents' opinions are given below.

P3: *"Children were playing games, I didn't know which games were what, which sites they were on. Now I've learned a little about social media. I'll do my best."*

P8: *"I can teach or learn to use the Internet well with my child, I can follow him and at least with my child I can discuss which sites are safe, how much and how."*

P13: *"I learned how to protect the computer from viruses, what to pay attention to when setting a password, how to deal with cyberbullying."*

Table 3.7: Suggestions for negative behavior solutions on the Internet observed by parents after education

Explain how to follow the path toward negative behaviors.	f	%
Controlling where my child goes	4	23.52
Time restrictions on tablet and phone use	3	17.64
Enabling access to trusted sites (starting with http)	2	11.76
Telling to be careful	2	11.76
Trying to talk when closed in, telling	1	5.88
Ensuring the safe use of the internet	1	5.88
Limiting the shares to the familiar ones from the settings on social media	1	5.88
Warning about adware	1	5.88
Ensuring that he/she must tell me about the bad situations to be encountered.	1	5.88
Saying not to share personal information	1	5.88
Total	17	100%

When Table 3.7 is examined, 23.52% (f=4) of the answers given by the parents for the solution suggestions for the negative behavior observed in their children on the Internet after education, were to act in a controlled manner about where their child enters, and 17.64% (f=3) to limit the time in the use of tablets and phones. 11.76% (f=2) stated that they should access reliable sites, and 11.76% (f=2) stated that they should be careful.

Some of the parents' opinions are given below.

P1: *"We do both the game and homework together anyway. We will do it together in a more controlled way."*

P8: *"I can at least follow these ways for my child to play games or enter sites that start with http at the beginning and use the Internet more properly. Now I realize that we must go in together."*

P10: “I would say that he should prefer reliable sites, that he may face bad situations, and that he should not be friends with everyone on social networks.”

The areas where parents need information security training in terms of adults are shown in Table 4. 40.

Table 3.8: After receiving this training, the areas of information security where education is needed for adults

After receiving this training, the areas of information security where education is needed for adults	f	%
Social network security	13	27.08
Safe Internet use	11	22.91
Using anti-virus	8	16.66
Smartphone use	8	16.66
Mobile security	3	6.24
In all areas of information security	2	4.16
E-mail security	2	4.16
Password security	1	2.08
Total	48	100%

When Table 3.8 is examined, 27.08% (f=13) of the answers given by the parents to the areas where information security needs training in terms of adults after receiving this training are social network security, 22.91% (f=11) safe Internet use, 16.66% (f=8) smartphone usage, 16.66% (f=8) anti-virus usage.

Some of the parents' opinions are given below.

P5: “After this training, it can be social network security, safe Internet use, anti-virus.”

P11: “Social network security and smartphone use after training.

P9: “After receiving this training, you can send your own information about using social networks, it can be damaged, of course, anti-virus is also important, if you learn to use safe Internet, risks are actually avoided, and a smartphone is also a necessity.”

Table 3.9: Solution suggestions for parents when they encounter social engineering after education

If you encountered such a situation after this training, what solutions would you suggest?	f	%
I will report to the police	9	33.33
I don't share my personal information, password, account number, etc.	6	22.22
I immediately close the site or the phone	3	22.22
I will report to the web notification address	3	11.11
I will be careful and never trust such people.	3	11.11
I block the malicious person	1	3.70
If my password is compromised, I will change it	1	3.70
If I come across a social network, I report it with a complaint.	1	3.70

Total	27	100%
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When Table 3.9 is examined, 33.33% (f=9) of the answers given by the parents for the solution suggestions they will bring when they encounter social engineering after the training, 22.22% (f=6) report my personal information, password, account number, etc. not sharing, 11.11% (f=3) shutting down the site and phone immediately, 11.11% (f=3) I will change my password if it is captured, and other 11.11% (f=3) is to be careful and not to trust such people.

Some of the parents' opinions are given below.

P8: "I never give my personal information to people who ask me for my personal information, and if I can't deal with it, I can definitely reach the web notification address."

P10: "Do not share my personal information, password, account number, etc. about myself if I come across it. I will report it to the police immediately."

P12: "Definitely do not provide personal information, I complain about social networks. I'll either call the police or call the hotline if its online."

Table 3.10: The benefits of the training to the parents in creating and using passwords on their personal computers.

How did this training raise awareness about creating and using passwords on your personal computer?	f	%
I understand that it is important to set my own personal password and not to share it.	8	25
I used to prefer easy passwords (such as date of birth), now I prefer hard passwords	7	21.87
Setting a hard password according to security criteria prevents us from being harmed by bad people.	7	25%
By opening a guest account for anyone who uses the computer other than us, I will not share my own password.	5	15.62
In the past, my computer used to open directly, now it opens with a password.	5	15.62
Total	32	100%

When Table 3.10 is examined, it is seen that 25% (f=8) of the answers given to the parents about creating and using passwords on their personal computers understand that it is important to set my own personal password and not to share it, and 21.87% (f=7) prefer an easy password beforehand. (for example, date of birth), that they now prefer difficult passwords, 21.87% (f=7) stated that determining a difficult password according to security criteria prevents harm from bad people.

Some of the parents' opinions are given below.

P5: "Awareness has been created on the computer, an account is created for everyone to use, a separate user account for the guest, for the family, for the child, so that he does not learn the incoming password, he enters from the guest account."

P7: "We didn't know how to set a password, now we set a password, it was useful for us, it was beneficial for our children, we know it, we don't share it with anyone."

P13: "What is private to me should be strong because only I can access it, it should not be told to anyone, it should not be an easy password."

Table 3.11: The effects of this training on the safe use of social networks

Can you explain in detail what effect this training has had on the safe use of social networks?	f	%
I act safer by sharing my social networks with my friends only.	10	29.41

I am setting up a security privacy setting.	9	26.4
I do not edit and share my Personal Password that I use on social networks.	5	14.7
I use social networks more carefully because using social networks unconsciously can cause negative situations.	4	11.76
I can block those who have bad behaviors, such as threats, cyberbullying	2	5.8
I have restrictions on my profile	2	5.8
We can take control of our children with what we learn on social networks	2	5.8
Total	34	100%

When Table 3.11 is examined, 29.41% (f=10) of the answers given by the parents to the effects of this training on the safe use of social networks, they acted more safely by sharing on social networks only with their friends, 26.47% (f=9) made security-privacy settings, % 14.7 (f=5) stated that they did not organize and share their personal passwords that they used in social networks. Additionally, (f=4), there are also answers stating that using social networks without knowing can cause negative situations, so they will use it more carefully.

Some of the parents' opinions are given below.

P2: "Need to set the security privacy settings. I shouldn't give my password to anyone."

P6: "I create my own secure password on social networks. Then, I can set a limit on my profile. I take such measures to prevent anyone from accessing my information."

P8: "I learned what I can do for my child, how important the password is, and since I learned security settings on the computer in this training, I should not share my important information with other people, make privacy settings, and not share many things with other people."

When Table 4.49, 100% of the parents stated that the education they received created awareness about protecting their computers or other electronic devices from harmful software.

Table 4.51 shows what the parents will do after the training to protect their computers or other electronic devices from harmful software.

Table 3.12: Situations by parents will adopt after training on protecting their computers or other electronic devices from harmful software

Situations by parents will adopt after training on protecting their computers or other electronic devices from harmful software	f	%
It is necessary to use an antivirus program on PCs or mobile devices.	12	39.99
When installing a new program on the computer, I must scan it with an antivirus program.	4	13.33
Flash etc. devices should not be opened without scanning them with an antivirus program.	4	13.33
I learned that I should clean my computer periodically by scanning it with an antivirus program.	4	13.33
If we save our information and make a backup, we will protect our information.	3	9.99
I determined that one of the software systems that harms the computer is viruses	2	6.66
I learned that the firewall also protects against malware.	1	3.33

Total	30	100%
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When Table 3.12 is examined, 40% (f=12) of the answers given by the parents about what they can do after the training to protect their computers or other electronic devices from malicious software is that it is necessary to use an antivirus program on PCs or mobile devices, 13.33% (f=4) when installing a new program on the computer, it is necessary to scan with an anti-virus program, 13.33% (f=4) say flash etc. on the computer. 13.33% (f=4) stated that devices should not be opened without scanning them with an anti-virus program, and that it is necessary to clean their computers by scanning them periodically with an anti-virus program.

Some of the parents' opinions are given below.

P2: "Must scan when installing a program on the computer."

P8: "I learned that there are many kinds of viruses on the computer, I knew them by hearsay before the training. Now, with this training, I have learned what to do, use an antivirus program, and clean my computer properly."

P10: "I didn't know we had to scan the files we downloaded. We should pay attention to the use of anti-viruses and firewalls to be protected from malicious software."

Table 4.53 shows the awareness that education brought to the parents about paying attention to modem password security.

Table 3.13: Awareness gained by the training about giving importance to the password security of your modem

After this training, how did you raise awareness about giving importance to the password security of your modem that you use at home?	f	%
I learned that the modem password should not be shared outside family members.	10	30.30
The first password provided after the modem is purchased must be changed.	6	18.18
It is necessary to determine the password is hard to find according to security criteria.	6	18.18
We should not allow the shared use of the modem.	6	18.18
The password should be changed periodically for security.	2	6.6
It is more appropriate to give names to the modem that cannot be identified as ours.	2	6.6
Now, I know not to use known passwords.	1	3.3
Total	33	100%

When Table 3.13 is examined, 30.30% (f=10) of the answers given by the parents to the importance of paying attention to the password security of the modems they use at home after this training, stated that the modem password should not be shared outside the family members, and 18.18% (f=6) stated that after the modem is purchased. the first password given must be changed, 18.18% (f=6) stated that it is necessary to determine the password as difficult according to security criteria, and 18.8% (f=6) stated that we should not allow shared use of the modem.

Some of the parents' opinions are given below.

P2: "Do not put my date of birth because others know, things to be known should not be used, I do not share them, Sir."

P4: "Do not give or share my modem password with anyone. It would be difficult."

P10: "Modem password is critical. We must edit the password according to certain security criteria. We must change it periodically. And we need to be mindful of shared use."

Table 3.14: Awareness raised by this training to protect parents from the risks that their children may encounter on the Internet

Are there any situations that you did not do before the training, but would do after the training, about protecting your children from the risks that they may encounter on the Internet?	f	%
When using the Internet, I take care to use it under control with my child or in the same room.	6	20
I inform my child about the risks he will face.	6	20
We should be very careful about cyberbullying.	3	10
After the training, I paid attention to my child's posts on social networks and to his friends.	3	10
Children should be told that personal information should not be shared.	2	6.66
I can prevent the risks by reducing the usage time of our children by putting a password on my personal computer.	2	6.66
Now my child will not be able to act according to his own mind because he knows that I also gain knowledge.	2	6.66
If my child is uneasy or distressed when he/she spends time on the internet, I talk to him/her.	1	3.33
I'm thinking of using a filtering program to protect it from harmful content by filtering it to safe sites.	1	3.33
After the training, I pay attention to whether the games my child plays are appropriate for his/her age.	1	3.33
We can reduce these risks by protecting our computers from malicious software.	1	3.33
Total	30	100

When Table 3.14 is examined, 20% (f=6) of the answers given by the parents to the awareness that the education they receive about protecting their children from the risks they may encounter on the Internet is that they take care to use the Internet with their child or in the same room under control, 20% (f=6).) stated that they will inform their child about the risks he/she will face. Additionally, 10% (f=3) state that they should be careful about cyberbullying, and 10% (f=3) state that they pay attention to their children's posts on social networks and friends.

Some of the parents' opinions are given below.

P11: "According to age groups, I can use the computer in a common area, so I can keep it under control, I can tell what to use and where."

P10: "Internet is both beneficial and harmful. After education, for example, there is a change in the behavior of the child who is exposed to cyberbullying. I pay attention to this. Who do you make friends on social networks? Who sees what you share? These are important. I will check if the games he will play are suitable for his age group."

P12: "We should be more careful. Especially when creating passwords and surfing social networks. We should only share our personal information and the photos on social networks with familiar people. Passwords that are difficult to find and mixed should be determined. This is the first time I've heard of cyberbullying. Great attention must be given. Also, you must scan the computer and back it up.

4. Discussion

There are various conveniences that information and communication technologies provide to our lives. Computers and the Internet open the doors of the world to learn, have fun and communicate. However, if the necessary knowledge is not obtained, the harms are also encountered. For this purpose, considering that education begins in the family, safe computer and Internet use by parents, who are role models for their children, becomes even more important. Thus, it is expected that their children will be lifelong learners by protecting them from the harms they may encounter. Considering the situation of explaining the concept of lifelong learning, all parents were aware of the concept of lifelong learning, and most of them stated that learning would continue from the cradle to the grave. The most important reason why parents turn to this education is that they want to improve themselves. According to this result, thanks to the parents who are aware of the necessity of lifelong learning, it is expected that their children will be individuals who are self-confident and open to learning. Ayaz (2016), in his study examining teachers' lifelong learning tendencies, states that those with a high level of lifelong learning are more willing to participate in courses, seminars, and symposiums related to personal and professional development, and that these studies are an important factor in the lifelong learning process. The findings of this study are similar to the research of Ayaz (2016). It is seen that the most important factor enabling parents to participate in the training organized on safe internet and computer use is self-improvement. Thus, they support the purpose of lifelong learning. All the parents who participated in the study stated that they achieved their purpose of participation. They stated that they achieved their goals by gaining knowledge through this education, not completing their deficiencies, helping their children, learning to use computers and following technological developments. In the study of Oskay and Yurttaş (2013), when the evaluation of the benefit of the parents participating in the research on the use of the Internet by their children, most parents were of the opinion that it is beneficial in terms of research and information, in terms of homework and lessons. Accordingly, the aims of parents in using the Internet for themselves and their children are similar.

They stated that they benefited especially in password security (using passwords, determining passwords according to security criteria) and mobile security at the point of providing information security in education. They also stated that they benefited from the things to be considered in sharing information. Cagiltay et al. (2011), it is stated that 46% of the children participating in the study did not know the rules for protecting their personal information and shared their personal information such as the date of birth with everyone. It is thought that this study will contribute to information security by transferring parents who have incomplete information about the things to be considered in sharing information with this education.

According to the findings, because of this training, providing the parents with the opportunity to control their children's Internet use, to observe them, and to help their children with what they have learned if they need it is the contributions of this education for their children. Additionally, it is one of the other contributions expressed that it enables them to prefer reliable sites suitable for their age. In the study of Oskay and Yurttaş (2013), the most important reason for the families participating in the study was to provide an Internet connection to their homes; most of the respondents stated that it is for the benefit of their children. Here, it can be said that the primary purpose of parents is always to help their children.

Akbulut (2013) study supports the recommendations of the parents to follow the course of their children's undesirable behavior on the Internet after receiving the training, to be controlled by the parents about where my child enters, to limit the time in the use of tablets and phones, to access reliable sites (starting with http). Demirel, Yörük, and Özkan (2012) found in their study that when the rules that parents impose on their children's use of the Internet are examined, they prohibit access to certain websites and limit the time spent on the Internet. Additionally, Holloway, Green, and Brady (2013) stated that parents should limit their children's screen time, which supports the statement given by parents as a solution to negative behavior. In the Tercan, Sakarya, and Çoklar (2012) study, it is similar to the measures taken by their families regarding the use of the Internet as expressed by the students.

According to the results of the research, the parents stated that after receiving this training, the greatest need for information security is social network security, safe Internet use, antivirus and smartphone use. According to Avinç (2017), the fact that children cannot properly evaluate the situations they encounter in social networks due to their inability to distinguish between real information and interpretation on the Internet also causes families to worry. When the answers given by the teachers about information security are analyzed in the study of

Canogulları (2021), in which the teachers' information security awareness levels are analyzed, it is seen that the teachers have moderate knowledge about information security. This shows the necessity for adults to receive training on information security.

According to the results of the research, it was stated that if the parents encountered an incident related to social engineering, they would first notify the police as a solution proposal. Additionally, personal information, passwords, account number, etc. with suspects. They said they would not share.

According to the results of the research, all the parents stated that the training provided raises awareness about creating passwords, they understand that it is important to set their own personal password and not to share it, they used to prefer easy passwords (such as date of birth), but now they prefer difficult passwords, according to security criteria. They stated that setting a password prevents harm from bad people.

In the study of Karaoğlu Yılmaz and Çavuş Ezin (2017), the parents' efforts to create complex passwords that cannot be guessed easily and to create passwords consisting of letters, numbers and special characters to ensure password security support the answers given by the parents after the training. In the study of Yılmaz et al. (2017), which examined high school students' awareness of secure computer and Internet use, the fact that most of the students could not create reliable and difficult to obtain passwords for password security is similar to the result encountered by the parents before the education. According to the results of the research, when the effects of the majority of the parents on the safe use of social networks were examined, the majority of them stated that they acted more securely by sharing with only my friends on social networks, and they made security-privacy settings. Akgün and Topal (2015), in their study with university students, show similarities with the opinions of parents after the education in that students make arrangements for privacy and security settings in social networks regarding social network security and attach importance to the protection of personal information. In Yorgancı's (2018) study examining parental attitudes towards children's use of social media, it was found that some parents did not know the concept of social media fully and because of this situation, they could not act consciously enough about their children's use of social media. Parents, who stated that social networks have benefits, showed contradictory attitudes about the harms and precautions to be taken in the answers given in the continuation.

This situation supports the views of the parents before education. For this reason, it is thought that the education that will be given to the parents will contribute greatly to their children.

They stated that education provided the situations that parents would adopt to protect their computers or other electronic devices from harmful software. In Tekerek and Tekerek's (2013) research, it is similar to the low awareness of students on issues such as checking for malware, protecting documents, personal computer security, using firewalls and filtering software. After the training, most of the parents stated that it is necessary to use an antivirus program on computers or mobile devices and stated that they increased their awareness on this issue. Additionally, in the study of Karaoğlu Yılmaz, Yılmaz, and Sezer (2014), the statements of using an antivirus program and updating the antivirus program also support the statements of the parents, when looking at the precautions taken by university students to protect themselves from harmful programs.

After this training, all the parents raised awareness about giving importance to the password security of the modems they use at home. Most parents stated that the modem password should not be shared with family members, to the awareness gained by education (Karaoğlu Yılmaz, Yılmaz, & Sezer, 2014). Additionally, it is among the other awareness that the parents stated that the first password of the modem should be changed, that the passwords to be determined should be difficult to determine according to the security criteria and that the modem should not be used jointly. In the study of Karaoğlu Yılmaz and Çavuş Ezin (2017), the parents stated that they created strong passwords that are difficult to guess and did not share them with anyone, to ensure the security of the Internet connection.

The education provided is about protecting their children from the risks they may encounter on the internet. They stated that they will inform their children about the risks and that they take care to use the Internet with their children or in the same room under control. In Oğur (2016)'s study, when parents' reactions to students' activities on the Internet are examined, it is similar to the post-education behavior of parents that they allow activities such as playing games, watching videos and listening to music on the Internet, with the knowledge of or under the supervision of their parents. Additionally, most of the students stated that their mothers did not know how to use

the Internet. This shows that no matter how conscious parents are about the Internet, they need to be educated about it. Training organized for this purpose is a critical issue.

5. Suggestions

Considering that development continues throughout life, everyone should have sufficient knowledge and skills. The fact that technology is indispensable at every aspect of our lives has made information security and the safe use of computers and the Internet even more important. Children born in the age of technology are the ones who are most exposed to the risks in the internet environment. For this reason, safe Internet use training was given to parents to create conscious families.

Suggestions are listed below:

- When we look at the studies in the literature, it is seen that even the educated adults cannot make up for the deficiencies in information security. For this reason, it may be recommended to provide training on safe Internet and computer use to adults working in different institutions.
- In the literature, studies have been conducted to determine the views of parents on the conscious use of the Internet. However, within the scope of lifelong learning adult education to address their deficiencies, parents can be socialized and self-development by organizing regular training with school-family cooperation.
- The children of the parents participating in the study are studying in the 5th and 6th grades. Students take the information technologies and software course, which is a compulsory course, at school. By asking children's opinions on safe Internet and computer use, both data diversity and curricular evaluations can be made.
- In this study, the research was examined in depth using the qualitative method, it can be supported with quantitative findings.
- In the study, the parents of the students expressed the areas they need in terms of information security as social network security and safe Internet use. For this purpose, social network security can be preferred as a separate study subject in education.
- Since the parents participating in the study had transportation problems, a time limit was applied, but since the parents also found education useful and wanted to participate in similar training, new studies could be conducted by increasing the number of parents, and by choosing the parents of the children studying in the 7th and 8th grades, a difference could be made.
- The content of the training to be organized can be decided by conducting a survey on safe Internet and computer use to the students by looking at their deficiencies. Thus, adult education can be supported in the lifelong learning process.
- The subject of risks in the Internet environment can be preferred as a new study topic since parents are anxious about the risks their children may face in the Internet environment, and because they participate in the training for this purpose.

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Ostracism and Life Satisfaction among Turkish Adolescents: The Role of Self-Efficacy as Mediator*

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Abstract

Purpose of the study is to examine the predictive role of ostracism on life satisfaction of Turkish adolescents. Secondly, it is aimed to examine the mediator role of self-efficacy on this relationship. Participants of the study are 659 adolescents between the ages of 15-18 ($\bar{x} = 16.45$; $SD = 1.08$). Mediation model was established to explain relationships between ostracism, self-efficacy, and life satisfaction. A mediation model was designed for ignorance and the other one is designed for exclusion as independent variables. First hypothesis is, ostracism negatively predicts life satisfaction. Additionally, another hypothesis of the study is self-efficacy will act as a mediator in the relationship between ostracism and life satisfaction. Data collection was realized via self-report scales to measure ostracism experience, self-efficacy levels, and life satisfaction levels of Turkish adolescents. Results exhibit correlation between life satisfaction and self-efficacy. And also, life satisfaction and self-efficacy exhibit negative correlation with ignorance and exclusion. Self-efficacy significantly predicted life satisfaction. Self-efficacy partially mediated the relationship between ignorance-exclusion and life satisfaction.

Keywords: Life Satisfaction, Ostracism, Ignorance, Exclusion, Self-Efficacy, Keywords, Introduction

1. Introduction

Life satisfaction (LS) is an essential construct in positive psychology (Gilman and Huebner, 2003), and is the most frequently studied aspect of subjective well-being (Diener, 2009). LS refers to cognitive evaluation of subjective well-being. LS is defined as “a global judgment that people make when they consider their life as a whole” (Diener, 1994:107, which refers to a conscious global judgment of one’s life (Diener, 1994). Huebner (1991) realized a study on correlations of life satisfaction with pre-adolescents. Subjects who reported high LS had also get higher points on measures of self-esteem, internal locus of control, and extraversion. Findings of Huebner (1991) reveal that, LS was influenced by personality characteristics. Subjects who feels higher LS had positive views of themselves, and are more extraverted, and show higher internal locus of control; as well as subjects who reported lower degrees of LS had negative views of themselves, and had external locus of control. These results give rise to the thought that perceptions of life predict global LS more than, the objective circumstances. Huebner (1991) stresses the importance of to study the relationship between positive involvement with others and LS with children and adolescents.

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Having satisfying social relationships determines LS. Veenhoven (1996) stresses the importance of, existence and quality of close ties, and social participation for life satisfaction. Individuals affiliated with volunteer organizations are more satisfied than non-affiliated individuals (Veenhoven, 1996). Higher levels of LS are correlated with social assertiveness and good empathy attributes (Veenhoven, 1996). Therefore, having good relationships and being in close social ties are important to experience a satisfied life. Diener and Larsen (1993) emphasizes that positive and negative affect are correlated respectively, with social versus alone situations. Researches underline that positive relationships with peers is associated with LS (Man, 1991; Suldo and Huebner, 2006). Regarding to developmental theories, social trajectories are crucial for adolescents' self-esteem, self-worth, academic achievement and healthy identity development.

Present study is realized on adolescent population. Adolescents need to develop satisfying relationships with peers and need to have more autonomy from parents (Hartup, 1996). Experiencing satisfaction in social relationships is crucial for mental, physical health, and well-being of adolescents. Satisfying peer relations are essential for normal social development in adolescence. On the contrary, negative experiences such as under satisfied social relations, poor peer interactions, feeling of not belonging to a group or being ostracized by peers may cause negative outcomes on mental health. Ostracism is defined as being ignored or excluded by others (Williams, 1997). Sense of belonging, self-esteem, control and meaningful existence deteriorate in the presence of social ostracism (Williams, 2007).

Research findings reveal that being ostracized is correlated with depression (Rudert, Janke & Greifeneder 2021; Niu, Sun, Tian, Fan, & Zhou, 2016; Jiang & Chen 2020; Gilman, Carter-Sowell, DeWall, Adams, & Carboni, 2013), loneliness (Witvliet, Brendgen, Van Lier, Koot, & Vitaro, 2010), distress (Masten, Eisenberger, Borofsky, Pfeifer, McNealy, Mazziotta, & Dapretto, 2009), unhappiness (Leary, Springer, Negel, Ansell, & Evans, 1998), and physical health problems (McGraw, 2016; Smart Richman, & Leary, 2009). Being ostracized is correlated negatively with high self-esteem (Nesdale, 2008) and well-being (Chernyak and Zayas, 2010). Ostracism can be experienced either as being excluded or being ignored by others (Williams & Zadro, 2007). When a person is ostracized he /she can't receive any response from others. Ostracized person loses his/ her sense of belonging, experiences decrease in self-esteem, self-worth and existential needs are threatened (Case & Williams, 2004).

Lazarus and Folkman (1984) emphasizes that consequences of a stressful experience is mediated by the individual's judgement and coping skills. Subsequently, adolescents' reactions to social ostracism are manifested quite differently from each other. Ostracized targets' judgements and coping with ostracism exhibit individual differences. Some of them are influenced less, while others show severe symptoms of ostracism. The present study is intended to examine role of self-efficacy (SE) in relationship between exposure to social ostracism and LS. Generalized SE may act such intervening variable. This is the focus of this study. SE has been broadly studied by social cognitive researchers (Bandura, 1997; Bandura, 2001; Lent, Singley, Sheu, Gainor, Brenner, Treistman, & Ades, 2005). Bandura (1994) defines self-efficacy as "one's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (p. 71). Subjective well-being research revealed that one's feeling good about his/her life and circumstances, is correlated with belief in his/her capabilities (McGregor & Little, 1998; Carver & Scheier, 1999; Ryan & Deci, 2001; Caprara & Steca, 2005; Lent, Singley, Sheu, Gainor, Brenner, Treistman, & Ades, 2005). Feeling higher levels of SE persuade to significantly greater perseverance when faced with challenges. Thus, individuals with strong SE beliefs achieve much more than individuals with lower SE beliefs. People who are confident in their problem-solving abilities use their cognitive skills more effectively than people who doubt their abilities (Bandura & Wood, 1989; Shunk and Zimmerman, 2006). Such a potency often leads to better solutions, people with high SE are more likely to continue to seek solutions to problems in the presence of difficulties.

The research purpose is to examine the relationship between ostracism and LS and role of SE as mediator in this relationship. Research has some hypothesis to test the mediation relationship. First it is hypothesized that ostracism (both subscales ignorance and exclusion) will predict LS. Second hypothesis is ostracism (both subscales) will predict SE. Third hypothesis is SE will predict LS. Fourth SE is a mediator in the relationship between ignorance and LS, and finally SE is a mediator in the relationship between exclusion and LS.

2. Method

The research design is relational survey model, which is realized to investigate the predictive role of ostracism on LS of adolescents and the role of SE as a mediator variable in this relationship.

2.1 Participants

The sample of the study consisted 659 high school students. Participants are 314 males (47,6%) and 345 females (52,4%). Study is conducted in 6 high schools from 3 different zones of Istanbul. 25,3% of the sample ($n = 167$) are 9th grade students, 26,3% are ($n = 173$) 10th grade students, 33,7% of the sample ($n=222$) are 11th grade students and, 14,7% ($n = 97$) of them are from 12th grade. Participants average age was 16.45 ($SD = 1.08$), the ages ranged between 15 and 18.

Data forms were applied under the permission of National Education Istanbul Directorate. After on, parents' signed consent was requested, subsequently all participants are given informed consent. Participants did not write down identity information on the data forms. Data forms were completed in the course hours, it took 15-20 minutes to complete.

2.3.2 Measures

Data was collected via scales of ostracism experience, self-efficacy, satisfaction with life, and a few demographic questions. All the tools are introduced briefly below.

Ostracism Experience Scale for Adolescents (Gilman, et al. 2013). Ostracism experience scale for adolescents (OES-A) is an 11 item, 5-point Likert type measure that assesses ostracism subtypes: Excluded and Ignored. Exclusion subscale keeps 6 items, and Ignorance subscale keeps 5 items. The alpha coefficients of the two scales in OES-A are reported as .94 for ignorance, .93 for exclusion in the original study. Turkish adaptation of the scale and validity, reliability studies were realized by Sertelin-Mercan (2016) with 462 adolescents. For the present study Cronbach α is calculated .83 for ignorance and .82 for exclusion.

Self-Efficacy Scale was used to assess the SE levels of participants. Scale was developed by Aysan (2002). There are 7 items for assessing the degree of perceived SE. This is a self-report 3-point Likert type scale. Higher scores indicate high perception of SE. Siyez and Aysan (2007) used the scale in a study with late adolescents and demonstrated adequate reliability. For the sample of the present study Cronbach α is calculated as.56.

Satisfaction with life scale was developed by Diener, Emmons, Lorse ve Giffin (1985). Turkish adaptaton was realized by Aysan (2001). There are 5 items. This is a self-report 7-point Likert type scale. Higher scores indicate perceiving higher LS. Cronbach's α coefficient for the original study was 0.84 (Aysan, 2001). For the present study Cronbach α is calculated .88.

Demographic Information Form: An information form used for demographic variables as age, sex and socioeconomic status.

2.3.3 Analyses

Initially the normality and variances of the data was examined. Kurtosis ve Skewness values were ranged between -1.5 and +1.5 as suggested by Tabachnick and Fidell (2013). The homogeneity of variances assumption was controlled via Levene's test. Means, standard deviations and bivariate correlations among the measures and subscales are calculated. T-test analyses for gender differences are calculated. Then separate linear regression analyses are realized with ostracism subscales (ignored and excluded) as predictor variables, and LS as criterion variable. SE is examined as mediator variable using criteria offered by Baron and Kenny (1986). Baron and Kenny (1986) highlight the need for existence of significant relationships between variables, furthermore, for partial mediation to be established, the beta coefficients have to be reduced, and for full mediation the beta coefficients have to be zero. Additionally, a Sobel test, is conducted when results indicated partial mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

3. Results

3.1 Analyses of demographic variables

T-test was calculated to explore if there is any difference according to gender and socio-economic status. There is no significant difference in ostracism and SE points among boys and girls. Significant gender differences emerged for only LS. Boys LS points found to be higher than girls [$t(657) = -1.58, p < .05$]. The scores obtained from the three scales did not differ according to the socio-economic level.

3.2 Correlation Analyses

To address the first hypothesis, correlations are calculated for the ostracism subscales (ignorance and exclusion) and LS. Pearson product-moment correlations are calculated. Means, standard deviations and bivariate correlations among the measures can be seen in table 1.

Table 1: Intercorrelations and Descriptive Statistics for Measures

	1	2	3	4	<i>M</i>	<i>SD</i>
1.Ign	-	.353**	-.228**	-.291**	6.91	2.59
2.Exc	.353**	-	-.107**	-.189**	20.12	4.84
3.SE	-.228**	-.107**	-	.241**	16.60	2.43
4.LS	-.291**	-.189**	.241**	-	22.24	6.99

Ign: Ignorance, Exc: Exclusion, SE: Self Efficacy, LS: Life Satisfaction

N=659

**

$p < .01$

Results of the correlation analyses, show that ignorance ($r = -.228; p < .01$) and exclusion ($r = -.107; p < .01$) were negatively associated with SE and ignorance ($r = -.291, p < .01$) and exclusion ($r = -.189; p < .01$) were significantly related to low LS. Finally, SE was correlated with LS, ($r = .241, p < .01$) indicating that adolescents who have obtained higher points in SE also get higher points in LS. All results put significant but weak correlations. As predicted the results revealed that ignorance and exclusion, correlated significantly and negatively with adolescent LS, and there are negative significant correlations between ostracism subscales and SE. The results reveal significant correlation between SE and LS.

3.3 Regression Analyses

Table 2: Simple Linear Regression Analysis Coefficients for Life Satisfaction

Measure	B	SE(B)	β	t	Sig. (p)
LS (constant)					
Ign	-.785	.101	-.291	-7.801	.000
Exc	-.273	.055	-.189	-4.942	.000
SE	.693	.109	.241	6.363	.000

Ign: Ignorance, Exc: Exclusion, SE: Self Efficacy, LS: Life Satisfaction

Constant: LS (IGN independent v.)

$R = -.291$ $R^2 = 0.85$ $F(1, 657) = 60.852$ $p = .000$

Constant: LS (EXC independent v.)

$R = -.189$ $R^2 = 0.36$ $F(1, 657) = 24.42$ $p = .000$

Constant: LS (SE independent v.)

$R = .241$ $R^2 = .058$ $F(1, 657) = 40.48$ $p = .000$

Results of the linear regression analysis indicated that ignorance [$F(1, 657) = -.60, 852, p < .000, R^2 = .085, \beta = -.291$] and exclusion [$F(1, 657) = -.24, 42, p < .000, R^2 = .036, \beta = -.189$] were significant negative predictors and SE [$F(1, 657) = 40.48, p < .000, R^2 = .058, \beta = .241$] was a significant and positive predictor of LS (Table.2).

Table 3: Simple Linear Regression Analysis Results For Self-efficacy

Measure	B	SE(B)	β	t	Sig. (p)
SE (constant)					
IGN	-.214	.036	-.228	-6.013	.000
EXC	-.054	.019	-.107	-2.769	.006

Ign: Ignorance, Exc: Exclusion, SE: Self Efficacy

Constant: SE (IGN independent v.)
 R=.228 R²= 0.52 F (1,657) = 36.155 p=000

Constant: SE (EXC independent v.)
 R=.107 R²= 0.12 F (1,657) = 7.667 p=006

Results of the linear regression analysis indicated that ignorance [F (1, 657) = -.36,155 p< .000, R2 =-.052, β =-.228] and exclusion [F (1, 657) = -.2,769, p< .006, R2 =.012, β =-.054] were significant negative predictors of SE (Table.3).

3.4 Multiple Regression Analysis

Table 4a: Multiple Regression Analysis for Life Satisfaction (IGN/SE)

Measure	B	SE(B)	β	t	Sig. (p)
LS (constant)					
SE	.529	.108	-.184	4.883	.000
IGN	-.672	.102	-.249	-6.610	.000

IGN: Ignored, SE: Self Efficacy, LS: Life Satisfaction

Constant: LS IGN, SE (independent v.)
 R=.342 R²_{adj}= .114 F (2,656) = 43.405 p=000

Table 4b: Multiple Regression Analysis Results For Life Satisfaction (ECL/SE)

Measure	B	SE(B)	β	t	Sig. (p)
LS (constant)					
EXC	-.238	.054	-.223	-6.013	.000
SE	-.642	.108	-.165	-4.942	.006

EXC: Excluded, SE: Self Efficacy, LS: Life Satisfaction

Constant: LS EXC, SE (independent v.)
 R=.292 R²_{adj}= .082 F (2,656) = 30.495 p=000

Results of the linear regression analysis indicated that ignorance [F (2, 656) =.43,405 p< .000, R2 =-.114, β =-.184] (Table.4a) and exclusion [F (2, 656) = -.30,495, p< .000, R2 =.082, β =.165] were significant negative predictors of SE (Table.4b).

Later on, ignorance and SE have been put together in a multiple regression analysis (Table 4a & Table 4b). For the mediation model to be approved, the beta coefficient for ignorance, in the presence of SE, have to be reduced. The results of the regression analysis show that ignorance remains as a significant predictor of LS in the existence of SE F (2, 656) = 43.405, p<.000, R2=.114, β =.184. However, the beta for LS was reduced from β = -.249 to β =.184. The analysis continued with, exclusion and SE have been put together in another multiple regression analysis. For the mediation model to be approved, the beta coefficient for exclusion, in the presence of SE, have to be reduced. Results of the regression analysis reveal that exclusion is still a significant predictor of LS in the existence of SE F (2, 656) = 30.495, p<.000, R2=.082, β =.165. Accordingly, the beta for LS was reduced from β = .223 to β =.165.

3.5 Mediation Analysis

The two-mediation hypothesis are examined by the procedures recommended by Baron and Kenny (1986). To investigate if, SE mediates the relationship between ignorance-exclusion and LS, a set of regression analyses are realized. First requirement of a mediation is the existence of a significant relationship between ignorance and SE and, a significant relationship between exclusion and SE. Results point out that ignorance is a significant negative predictor of SE, $F(1, 658) = 36.15$, $p < .000$, $R^2 = .05$, $\beta = -.22$. Subsequently multiple regression analysis is realized. Results reveal that SE significantly predicted LS, $F(1, 657) = 40.48$, $p < .000$, $R^2 = .058$, $\beta = -.24$. After all, a multiple regression analysis is realized to examine whether ignorance and SE together predict LS. It is required the beta coefficients for ignorance (in the existence of SE) to be reduced for a mediational relationship. Results of the regression analyses demonstrate, ignorance remained a significant predictor of LS in the existence of SE $F(2, 656) = 43.40$, $p < .000$, $R^2 = .11$, $\beta = .18$. The beta for LS was reduced from $-.24$ to $.18$. Then, a Sobel test was also conducted (MacKinnon et al., 2002). The Sobel test $z = -3.78$, $p < .001$, demonstrated the reduction in the beta coefficient of ignorance. These findings suggest existence of partial mediation. An illustration of this relationship can be seen in Fig.1.

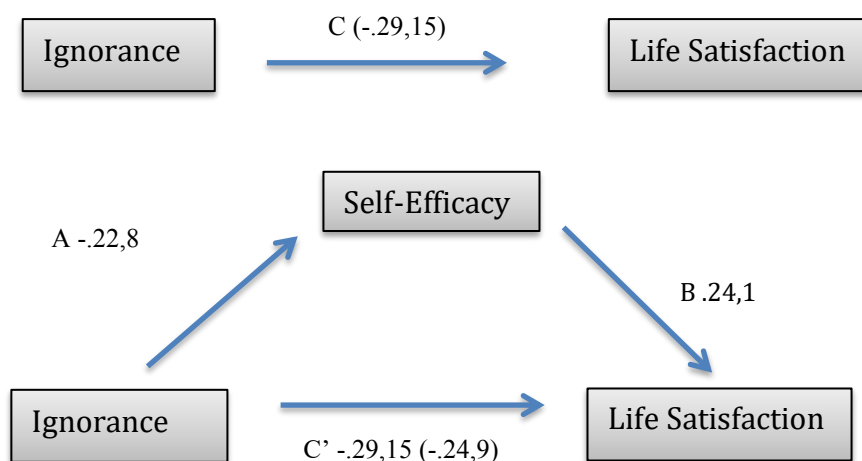


Figure 1: Path model for the mediator role of SE in the relation between being ignorance and LS. (* $p < 0.01$.)

This time, to examine if SE mediate the relationship between exclusion and LS, a set of multiple regression analyses were realized as suggested by Baron and Kenny (1986). First requirement of a mediation is the existence of a significant relationship between exclusion and SE. Results reveal that exclusion is a significant negative predictor of SE, $F(1, 658) = 7.66$, $p < .000$, $R^2 = .01$, $\beta = -.11$. Later on, multiple regression analysis is realized for analyzing if SE is predicting LS. Outcome of the analysis, point out that SE significantly predicted LS, $F(1, 657) = 40.48$, $p < .000$, $R^2 = .058$, $\beta = -.241$. After all, a multiple regression analysis is realized to examine whether exclusion and SE together predicting LS. It is required the beta coefficients for exclusion (in the existence of SE) to be reduced for a mediational relationship. Results of the regression analyses demonstrate, exclusion remained a significant predictor of LS in the existence of SE $F(2, 656) = 30.49$, $p < .000$, $R^2 = .08$, $\beta = .22$. The beta for LS was reduced from $-.24$ to $.18$. Then, a Sobel test was also conducted (MacKinnon et al., 2002). The Sobel test $z = 2.56$, $p < .05$, demonstrated the reduction in the beta coefficient of exclusion reveal existence of partial mediation. An illustration of this relationship can be seen in Fig.2.

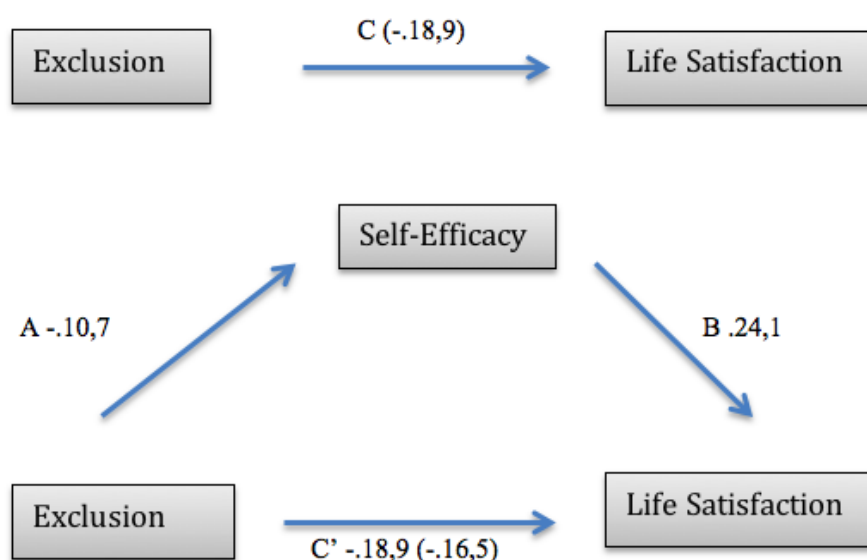


Figure 2: Path model for the mediator role of SE in the relation between being exclusion and LS. (* $p < 0.01$.)

4. Discussion

Purpose of the study was to examine the predictive role of ostracism on LS and the mediator role of SE on the relationship between ostracism and LS. Participants of the study are 659 adolescents between the ages of 15-18, living in Istanbul. Two models were established to explain relationships between ostracism, SE and LS, one model was designed for ignorance and the other one is designed for exclusion as independent variables.

Results of the intercorrelations revealed that social ostracism in both forms, exclusion and ignorance, was negatively and SE was positively correlated with LS. Beeri and Lev-Wiesel (2012) emphasizes that peer rejection is a traumatic experience, however, some resources on personal or social bases may diminish the stress level of rejected individual. These personal and social resources are self-confidence, self-control and societal hope which are together defined as potency Beeri and Lev-Wiesel (2012). Research (Sandstrom, 2004; Kupersmidt & DeRosier 2004) reveal that to have potency helps to overcome the distress of traumatic experiences. In the present study SE can be considered as a potency to diminish the negative effect of social ostracism on LS. Results demonstrated that, SE plays predictive role in adolescents' LS. Higher levels of SE were associated with higher levels of LS. These results are coherent with a body of research that has linked SE with other well-being outcomes (Tagay, Karatas, Bayar, & Savi-Cakar, 2016; Marcionetti & Rossier, 2016; Masaud Ansari, & Khan, 2015; Wright, & Perrone, 2010). Regression analyzes showed that, both ignorance and exclusion by peers, predicted LS negatively. Ostracized adolescents feel lower levels of LS, than adolescents who experience lower levels of ostracism. SE was hypnotized to be a mediator variable in the predictive relationship between ostracism and LS. Results of the mediation analyzes supported this hypothesis. SE has a mediator role on the predictive relationship between ostracism subscales and LS. Individuals, who do not have a strong sense of SE perceive problems or obstacles more difficult than they seem, individuals with a higher level of SE are more comfortable in difficult tasks, difficult goals or difficult events (Bandura, 1994). Individuals who believe in his/her competencies can stand calm, confident and strong. It can be thought that perceiving higher levels of SE may reduce negative consequences of being ignored or being excluded by peers, on LS of adolescents. Research reveal that low SE is related to depression (ZimmerGembeck, Hunter, & Pronk, 2007; Maddux & Meier (1995), anxiety problems (Williams, 1995), and suicide intention (ZimmerGembeck, Hunter, & Pronk, 2007). The SE approach, highlights that for

psychological adjustment it is essential to have, a sense of self-competence or self-control (Maddux, 1995). Our evidence confirms that to support LS of adolescents, it's prior to enhancement of social skills, peer relationships and SE.

Limitations and Suggestions for Researchers: There are some limitations of the study. An important limitation involves the homogeneity of the sample, the study is conducted in Istanbul although three different districts are included the study, it would be much better to extend the findings geographically diverse samples and different adolescence stages to explore developmental considerations in the associations between ostracism, SE and LS. Another limitation is the correlational nature of the research, the variables should be examined deeply by using experimental studies aiming to develop sense of SE in adolescents, also via experimental studies research should address the factors leading to ostracism. Additionally, longitudinal studies examining consequences of ostracism on LS in different stages of childhood and adolescence. In addition, all the measures used in the study were self-report scales. Multiple methods of assessment of variables (e.g., parent, friend, teacher reports) would enhance the worthiness of the findings.

Suggestions for School Counselors: In accordance with the results of the study, several suggestions can be made for school counselors. This study, along with previous studies, suggests that low SE and weak social relationships are risk factors for adolescent dissatisfaction. Moreover, experiencing ostracism appears to predict lower LS. SE mediates ostracism and LS association. Such findings help to put forth probable pathways to the enhancement of LS of adolescents. The presence and quality of social relationships are important for development of LS. Lack of social skills and poor communication abilities are the main obstacles to the establishment of satisfying social skills. These are the topics that can be easily targeted in school settings. As the evidence confirms that SE has a significant role in establishing LS. Psycho-educational programs can be provided in schools for students which show lower levels of SE. Since social inclusion and SE are important variables in establishing LS, an appropriate environment, supporting to develop SE and social acceptance of students will contribute to their SE.

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Turkish Primary School Students' Knowledge, Behavior, and Awareness of "Healthy Living": Reflections on the COVID-19 Epidemic Process in the Context of Life Science Course

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Abstract

This research aims to assess the impacts of the COVID-19 epidemic process on the knowledge, thoughts, actions, and awareness of primary school pupils regarding "healthy life," in accordance with the attainments of the Turkish Life Science curriculum. The research was conducted using phenomenology. Maximum variation sampling was utilized to determine the study participants. Accordingly, primary schools located in three distinct settlements (middle-upper and lower-middle socio-economic levels located in the district centre and the town connected to the district) were chosen for the 2020–2021 academic year in the Tavşanlı district of the Kütahya province of Turkey. The information was collected from 18 pupils in the primary schools' 1st, 2nd, and 3rd classes. A semi-structured interview form was utilized to collect data for the study. The dataset was analysed using the approach of descriptive analysis. According to the findings of the study, the students were aware of healthy life. In addition, it was revealed that a large percentage of student responses overlapped with the associated subjects and attainments of the Life Science courses. During the COVID-19 outbreak, students reported that their lives were affected in the areas of "academic, health, personal, and social". Concurrently, it has been determined that their lifestyles have changed in a variety of ways, as well as their attitudes and actions regarding healthy living. In this context, it may be stated that diverse subjects should be incorporated into students' in-school and extracurricular activities in order to increase their knowledge, abilities, and awareness of healthy living.

Keywords: Healthy Living, Health Literacy, Life Science Course, COVID-19

1. Introduction

Throughout history, numerous events in the world have brought up a variety of health issues. Recent outbreaks of the COVID-19 pandemic disease have occurred simultaneously and instantaneously throughout the world. In this regard, the need for education, understanding, and awareness of healthy living becomes apparent at the same rate that such difficulties that have been encountered in the course of history and that inhibit healthy existence tend to reappear. An educational process on healthy living; in the pre-school years, it is dealt with randomly in the family and near environment, and in primary school, it is dealt with in a more planned manner within the boundaries of

the curriculum and in various courses under the direction of certain courses. Because the objective of health education in schools is to reinforce the child's beneficial pre-school health knowledge, attitudes, and behaviours and to replace the bad and insufficient ones (Bahar, 2010).

Although there is similar information in many primary school topics, the Life Science course appears to be the first and most essential building block in the context of health and healthy life education. In the primary school years, children's personalities and futures are shaped; this is a crucial time when the acquired knowledge, abilities, values, and concepts prepare them for life and the subsequent learning phases. The Life Science course includes basic concepts, knowledge, and skills that are directly related to daily life and can affect the entire life in the primary school period; It is a course that aims to gain knowledge, skills, behaviours, and attitudes about life, to adapt to the environment, and to adapt life-related issues to the developmental characteristics of the student (Binbaşioğlu, 2003; Gültekin & Özenç İra, 2010).

It is observed that the topic of a healthy lifestyle, which was implemented in Turkey in 2018, is covered in depth in the Life Studies course curriculum for grades 1-2-3 (MEB, 2018). Consequently, the program's learning attainments relating to a healthy lifestyle are listed in Appendix-A. The conceptual framework derived from these attainments is depicted in Figure 1. Examining the relevant acquisitions and conceptual structure reveals numerous contents associated with nutrition, cleaning habits, personal care, physical activity, sleep, public health, environmental cleaning, health problems, and health protection. Throughout history, numerous events in the world have brought up a variety of health issues. Recent outbreaks of the COVID-19 pandemic disease have occurred simultaneously and instantaneously throughout the world. In this regard, the need for education, understanding, and awareness of healthy living becomes apparent at the same rate that such difficulties that have been encountered in the course of history and that inhibit healthy existence tend to reappear. An educational process on healthy living; in the pre-school years, it is dealt with randomly in the family and near environment, and in primary school, it is dealt with in a more planned manner within the boundaries of the curriculum and in various courses under the direction of certain courses. Because the objective of health education in schools is to reinforce the child's beneficial pre-school health knowledge, attitudes, and behaviours and to replace the bad and insufficient ones (Bahar, 2010).

Although there is similar information in many primary school topics, the Life Science course appears to be the first and most essential building block in the context of health and healthy life education. In the primary school years, children's personalities and futures are shaped; this is a crucial time when the acquired knowledge, abilities, values, and concepts prepare them for life and the subsequent learning phases. The Life Science course includes basic concepts, knowledge, and skills that are directly related to daily life and can affect the entire life in the primary school period; It is a course that aims to gain knowledge, skills, behaviours, and attitudes about life, to adapt to the environment, and to adapt life-related issues to the developmental characteristics of the student (Binbaşioğlu, 2003; Gültekin & Özenç İra, 2010).

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Figure 1: The conceptual Framework of “healthy living” in the Life Science course curriculum

The new COVID-19 coronavirus epidemic, which began on December 31, 2019 in Wuhan, China, and spread to nearly all countries within a few months, has brought with it a very different process that affects all aspects of life (Paudel, 2021). While nations struggle with the economic, sociological, and psychological effects of the epidemic, people have encountered a variety of concepts, including an epidemic, virus, mask, social distance, quarantine, disinfectant, and new forms of life. All authorities worldwide have issued warnings regarding concepts such as a healthy lifestyle, cleanliness, hygiene, and a robust immune system. In addition, important regulations were imposed on individuals within the context of social isolation. On the other hand, children have witnessed experiences such as being separated from their friends, not being able to play outside, staying away from family and close friends, and the cancellation of group activities due to the transition to distance education following the complete closure of schools.

In terms of education, children who are in the full-time school period have entered a new life and awareness process associated with healthy living (cleaning, hygiene, mask, gloves, disinfectant, cologne, nutrition, movement, etc.). Because avoiding or combating an invisible, contagious, and unknown-origin virus has resulted in a drastically different experience for children. On this basis, the study focused on students' knowledge, behavior, and awareness of healthy living. In this context, it was attempted to determine the effects of the COVID-19 process on students' knowledge, behavior, and awareness of healthy living. At the same time, it is anticipated that students will learn healthy and unhealthy behaviors, draw various lessons and conclusions from the epidemic process, and support the development of health literacy skills that they can use for the rest of their lives. It is therefore possible to predict the degree to which the content learned about healthy living in Life Studies courses in Turkey overlaps with daily life and the degree to which Life Studies courses and related curriculum prepare students for real life. The purpose of this study is to examine the effects of the COVID-19 epidemic on the knowledge, behavior, and awareness of "healthy life" among primary school students, per the objectives of the Life Science course. In this regard, the following sub-questions were investigated:

- What do primary school students know about healthy living?
- What changes have occurred in the context of “health”, “education”, “personal” and “social” of their lives as a result of the COVID-19 outbreak?
- In the context of healthy living, what changes have occurred in terms of awareness, knowledge, behavior, and awareness before and after the COVID-19 epidemic?

2. Method

The research design, methodology, participant details, data collection instruments, data gathering and analysis steps, as well as investigations of credibility, verifiability, transferability, and reliability are all provided here.

2.1 Research Design

Qualitative research methodologies, such as the phenomenology pattern, were used to conduct this study. The purpose of a phenomenology study is to shed light on how various people who have first-hand contact with an event interpret that experience and what they take away from it (Patton, 2014). The researchers opted for a phenomenological approach because they wanted to compare and contrast the perspectives of students who experienced the COVID-19 pandemic at roughly the same time but in very different ways, setting those comparisons and contrasts against the attainments of the Life Science curriculum. In this way, it was tried to determine how the students were affected by the epidemic process within the framework of "healthy life", and what kind of changes occurred in their awareness and behavior. At the same time, this situation was evaluated according to the achievements of the Life Studies course. In addition, the effect of what the students learned in the context of "healthy life" in the Life Studies lessons was also revealed.

2.2 Participants

The maximum variation sampling approach (a purposive sampling technique) was used to select the study's participants. For the upcoming 2020-2021 school year, three primary schools in the Tavşanlı district of Turkey's Kütahya province were chosen randomly. These schools are located in economically diverse neighbourhoods (the district centre, a nearby town, and a more economically disadvantaged neighbourhood). Data were acquired by conducting semi-structured interviews with a total of 18 pupils, two each from the 1st, 2nd, and 3rd classes at various primary schools (Table 1).

Table 1: Participants of the Study

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School	Grades						Total
	Grade 1		Grade 2		Grade 3		
	G	B	G	B	G	B	
M.E. Primary School (district centre)	x	x	x	x	x	x	6
N.S. Primary School (in the coastal area in the district centre)	x	x	x	x	x	x	6
G.Ü. Primary School (in the city attached to the district)	x	x	x	x	x	x	6
Total							18

2.3 Data Gathering Instrument and Implementation Process

The data for this study were gathered using a semi-structured interview form designed and developed by the researchers. The researchers compiled a pool of totally 15 interview questions prior to conducting interviews. At least one drilling question was added to each question. The questions were then updated based on the comments of academics with expertise in primary teaching and the life sciences. Lastly, pilot interviews were done with three students from 3rd grade excluded from the study. Observing the utility of the questions in this manner, the actual interviews were done after giving final shape following the appropriate preparations. The 8 main questions were used in interviews. By participating the researchers, the interviews were conducted through the Zoom program and were completed in nine days, with two students per day totally 18 students. Video recordings were taken in

accordance with the participants' permission. The interviews were taken between 12 and 17 minutes. The collected data was then transcript into text by the researchers.

2.4 Data Analysis

The content analysis method was utilized to analyze the study's data. It is to bring together the data within the framework of certain concepts and themes and to organize and interpret them in a way that the reader can understand (Yıldırım & Şimşek, 2006). Content analysis is a systematic, iterable technique in which some words of a text are summarized into smaller content categories with coding based on certain rules (Büyüköztürk et al. 2013). Since this study was carried out in a phenomenological pattern and through interviews, in-depth data were tried to be reached by using content analysis. Therefore, the opinions of the participants who experienced the same phenomenon from different angles were determined. In the context of this study, it is the phenomenon of the research that the COVID-19 process is experienced at the same time in terms of "healthy life". In this respect, students who experience this process together are the focus of this research. Various codes and themes were reached by analyzing the data obtained during the analysis process. These codes and themes were given to the academics with expertise in primary teaching and the life sciences. According to their feedbacks, some changes were made in analyze process.

2.5 Trustworthiness, Credibility and Ethical Considerations

The researchers in this study took efforts to assure credibility, transferability, and ethical control. These measures consist of:

Table 2: The trustworthiness and credibility studies of the research

Trustworthiness and Transferability	Obtaining experts' opinion
	Direct quotation
	A description of the instrument and procedure for data collection.
	A description of the data analysis method
	Participants and the implementation process are described.
Credibility and Coherence	Presentation of the study's limitations
	Presentation of the results in their natural form without comment
	Creation of a checklist
	Checking the data by experts
	Verification of the coherence of the data

For the questions to be used in the data collection instrument, the opinions of the experts were sought, and the necessary arrangements were made in accordance with their suggestions. After obtaining the necessary permissions, pilot interviews were conducted to determine the utility of the questions, and they were then prepared for the actual interviews. In addition, direct student perspectives were included in the presentation of the findings in order to present the data as accurately as possible. In addition, the participants' identities were concealed by using the code names assigned to them instead of their actual names. Due to the COVID-19 outbreak, Zoom was utilized to conduct online semi-structured interviews. In order to prevent data loss, video recordings were taken in accordance with the participants' permission. These records were never used for any purpose other than research and were never shared with a second individual or organization. Before the interviews, the participant students and their families were informed about the study and a consent text was presented to the family and the student; interviews were conducted after obtaining their consent. At the beginning of the interview, audio or video confirmation was obtained. In the process of analyzing the data, the researchers created a checklist by individually coding the data and developing themes. The researchers then compared the checklists and reviewed the records from the re-interviews to identify any discrepancies.

The scope of this study is restricted to 1st, 2nd, and 3rd grade students in the Tavşanlı district of Kütahya province, Turkey, during the 2020–2021 school year. Currently, it is based on the inclusion of the Life Studies course in the curriculum of these classes. In addition, these students' schools were selected from various Tavşanlı communities.

As a result of the COVID-19 outbreak, online interviews were conducted during the data collection process, as schools were implementing distance education. Therefore, the possibility of controlling certain variables that may influence students' emotional states, perspectives, and discourses, such as shyness and excitement, is limited. Therefore, the research's limitations should be evaluated within this framework. Lastly, for the present study ethics committee approval was taken from Usak University, Ethics Committee for Researches on Social Sciences and Humanities with the decision numbered "2021-08" in the session dated 07/01/2021.

3. Findings

This section presents the results of the data collected through interviews as part of the research process.

3.1 Students' perceptions of "healthy living"

First sub-question of the research was about determining the views of the students. In order to find out the students' perceptions about "healthy living", they were first asked what comes to their mind when they say "healthy living" and what is harmful to their health. This was done to find out what students had learned in the relevant courses, especially in the life science course.

3.1.1 Useful things for a healthy life

Accordingly, students responded within the concepts of "eating a balanced and regular diet, cleanliness and hygiene (personal and environmental), exercising, getting a balanced and sufficient amount of sleep, and protecting themselves from disease." The related codes and categories are shown in Figure 2.



Figure 2: Students' perceptions of useful things for a healthy life

According to Figure 2, it can be seen that the students relate "healthy life" with nutrition and hygiene in general. The students have general beliefs about "consumption of healthy food and drink" and "healthy and balanced diet" within the context of "nutrition":

Buse: We should consume foods that are good for our health. Meat and meat products, fish, milk and dairy products, fruits and vegetables should all be consumed.

Fadime: We need to eat a balanced and consistent diet... We need to eat more vegetables and fruits.

Gülcan: Drinking plenty of water. Eating regularly and eating a nutritious breakfast. Before going to bed, I drink milk.

However, some students emphasize the variety and naturalness of food and beverages:

Kemal: We should prepare our meals at home.

Yalçın: We should eat eggs, cheese, and olives. We should consume yogurt and milk... We should not make distinctions between meals.

Yavuz: Eating healthy and safe foods, as well as seasonal vegetables and fruits.

In addition, pupils' knowledge of "cleaning and hygiene" issues varies. Students deal with this topic from both a personal and an environmental perspective.

Buse: We should take care of our hygiene. We should wash our hands frequently, take baths, and trim our nails. We should brush our teeth. We should keep our clothes clean and the environment clean.

Murat: Housekeeping. Cleaning our dwellings. We thoroughly wash our hands with soapy water after leaving the outdoors. paying close attention to what we consume.

Similarly, despite the fact that the associated question was not directly related to the COVID-19 outbreak era, the students responded with relevant information. Notable is the fact that the pupils are affected by the current epidemic and that they continuously repeat the warnings they hear at home, in their environment, and in the media. At the time of the study, this was a contemporary procedure, thus it was natural for the students to respond in this manner.

Gülcan: ... Taking care of our personal hygiene by cleaning our teeth, bathing, cutting our nails, and combing our hair... We must focus on our personal hygiene and the cleanliness of our living spaces... In the event of an epidemic, people should not leave their homes unless absolutely essential. Allow them to wear a mask when going outside, maintain a safe distance, avoid crowded or enclosed areas, and carry disinfectants.

Some students emphasize the connection between sports and healthy living. As a result, it offers perspectives on meeting the need for daily movement or play;

Beril: Playing sports and getting some fresh air. We are taking care of ourselves.

Fadime: I enjoy jogging or walking and playing video games.

using sports equipment at home or in other settings,

Yavuz: We should participate in sports every day. I'm attempting to open and do exercises online from home.

Buse: We should participate in sports. It could be either walking or cycling. The park in front of my house has sports equipment.

Hale: Walking and running. Rollerblading, inline skating, and biking. You can also work out at home.

and caring for a sport:

Nida: I enjoy walking, cycling, and karate as a sport.

Hale: Basketball is one of my favourite sports, to say it again. I like to play hopscotch, skip and jump rope.

Some students discuss adequate and balanced sleep in terms of healthy living.

Kemal: We need to get enough sleep so that our bodies can stay strong and resilient...

Fadime: It is so important sleeping and I'm getting enough sleep...

İsmet: We must take care of ourselves... We should schedule enough time for sleep.

Furthermore, protection from diseases and microbes in general appears to be another point raised by the students:

Seda: Eating well, not getting sick, and being germ-free. Taking care of our cleanliness.

3.1.2 Things that disrupt healthy living

When asked what factors hinder a "healthy living," students cited "not eating a healthy and balanced nutrition, consuming various harmful ready-made and packaged products, not paying attention to cleanliness and hygiene, not engaging in sports, getting insufficient and unbalanced sleep, and being addicted to technology." Figure 3 demonstrates the applicable categories and codes.

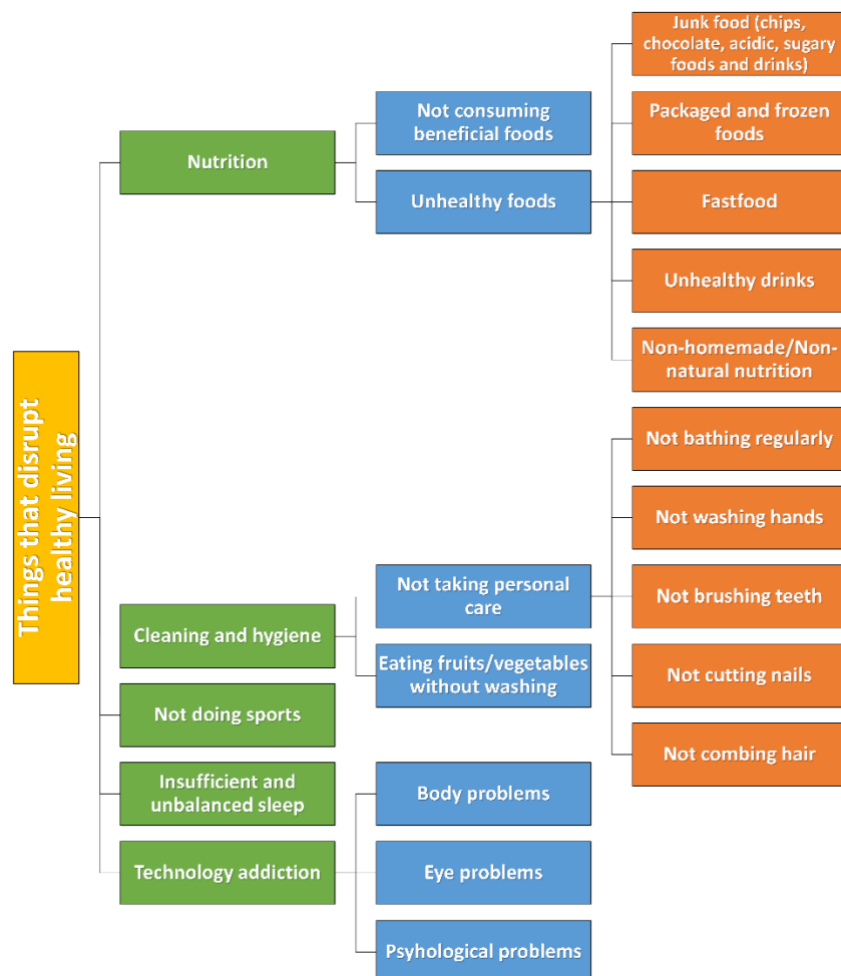


Figure 3: Students' perceptions of things that disrupt healthy living

Figure 3 shows that students are strongly aware of the factors that can compromise a healthy lifestyle. Particularly, concerns related to food and nutrition become more noticeable. Therefore, poor "nutrition" is characterized by a diet low in good foods and high in dangerous ones or a diet low in beneficial foods overall.

Buse: Poor eating habits. Such as, for instance, deciding to eat poorly. Foods like soda, chocolate, chip, and burger chains. Prepared in a kitchen other than one's own.

Gülcan: Not keeping to a regular eating schedule. The practice of eating pre-packaged food bought from stores or restaurants.

Some students voiced concerns that "not consuming beneficial foods and not eating organically, consuming dangerous snack foods labelled pre-packaged, frozen, packed, acidic, sugary, and junk food" impedes healthy living.

Erkan: We should eat naturally instead of eating processed foods like chocolate and chips.

Kenan: Consuming unhealthy foods and fast food. Utilizing boxed food...

At the same time, they indicated that neglecting personal hygiene and personal care such as bathing, dental, nail, and hair care, not exercising, and inadequate/imbalanced sleep also affect health.

Buse: Negligence in maintaining a clean environment. To avoid getting sick, always wash your produce before eating it. Ignoring your own health and well-being.

Kenan: Neglecting our personal hygiene by not cleaning our teeth, trimming our nails, having a bath, or washing our hands. Because we spread the most germs through our hands. Inactivity in sports can also impair a healthy lifestyle.

Gülcan: Neglecting personal hygiene by not washing clothes frequently or taking baths on a regular basis. Irregularly avoiding sports.

In addition, there were students who talked about technology addiction and stated that too much time with technology causes anatomical, eye, and even some psychological problems.

Hale: ... We aren't taking care of ourselves by, for example, sleeping enough. Electronic gadgets are hazardous to our health. Overexposure can lead to headaches, back pain, and problems with your eyes and posture.

Özgür: Being careless about getting enough rest. Devoting an unhealthy amount of time to screen time. Too much time spent with a screen is bad for our health in many ways, including our muscles, eyes, and minds.

It can be said that students have the cognitive awareness of a healthy lifestyle. Accordingly, it can be said that students have a wide range of knowledge about healthy lifestyles based on their family, individual, and school life experiences. Looking at the students' views, it can be said that a healthy lifestyle is predominantly associated with "nutrition" and that there is a nutrition-related knowledge and understanding based on consuming what is beneficial for a healthy lifestyle and avoiding what is harmful. At the same time, it is noticeable that there is a sensitivity to cleanliness and hygiene.

More than a year had passed since the outbreak of the COVID-19 epidemic at the time the study was conducted, and there were constant reminders of precautions in digital, written, and visual media; in addition, families were deeply invested in the topic and taught their children accordingly. The fact that they provided detailed information can also be considered as one of the points to be considered. In addition, the risk of venturing out during the epidemic and the significant measures taken at the local and national levels caused people to remain at home and move very little. In this process, children attempted to satisfy their exercise and play requirements at home or in extremely restricted settings. So it is possible to explain the students' perspectives on sports, exercise, and play in this manner. Nevertheless, they are sometimes exposed to technological devices and spend their time in ways that are beyond their control. However, it can be said that students are aware of the negative consequences of excessive technology use.

In addition, it can be observed that students have interacted with nearly all nodes of the conceptual network in Figure 1, which is comprised of course gains in Life Science. This can be interpreted as a result of the learning content and topics related to healthy living that they encounter in other subjects, particularly life science. In this context, a drilling question related to the first sub-question were asked to students as "In which courses do you think you learned about healthy living?". The responses of the students are shown in Table 3. Table 3 reveals that all students prioritized the Life Science course. Nonetheless, it can be said that students do not learn only in Life Science about "healthy living". In addition, they learn about it in Turkish, Physical Education, and Physical Education and Science. It can be seen that school and course processes are very important in terms of developing "healthy life" awareness. At this point, it should be handled with a wide range of interdisciplinary approach.

Table 3: According to the students, the lessons they learned about "healthy living"

Name	Life Sciences	Turkish Language	Physical Education and Sports	Science
Ahmet	X	X		X
Ayşe	X	X		
Buse	X	X	X	
Beril	X	X		X
Erkan	X	X		
Fadime	X	X	X	
Gülcan	X			

Hale	X	X		
Kemal	X		X	X
Kenan	X		X	X
İsmet	X	X	X	
Murat	X	X	X	
Nida	X	X		X
Özgür	X	X	X	
Rabia	X	X	X	X
Seda	X	X	X	
Yalçın	X	X	X	
Yavuz	X			X
Total	18	14	10	7

3.2 Changes in life during the epidemic

Students were asked what changed in their daily lives and how the progression of the COVID-19 epidemic affected their lives. Accordingly, the responses of students were categorized according to education, health, and social life.

3.2.1 Health

Figure 4 shows how students felt about the effects of the COVID-19 epidemic and how it changed over time on their health experiences, attitudes, and habits. So, categories like "following rules and warnings about cleanliness and hygiene", "nutrition", "avoiding/protecting against disease", "sports/exercise", and "disrupting sleep patterns" were made.



Figure 4: Changes in health during the COVID-19 process

Students are generally affected by the COVID-19 process in a wide range of health. In particular, the warnings issued in society and in the media of all kinds about the need to pay attention to cleanliness and hygiene, which are the main reasons for the spread of coronavirus, were the most emphasized by students. At the same time, individual, local and national measures to prevent the infection and spread of the virus restricted people's movement, required the observance of mask and distance rules outside the house, and brought various habits such as disinfectants. These situations have occupied a wide space in the opinions of students.

Kenan: We've begun to tidy the house more frequently. We were using vinegar water to clean the homes at the start of the pandemic. Again, we were more concerned with taking care of ourselves. I can't go out, I can't go to the park, and I can't play with my friends like I used to.

Kemal: ... When I leave the house, I wear a mask and carry a disinfectant. I notice social estrangement. I maintain my personal cleanliness. I bathe, trim my nails, and maintain tidy hair.

Erkan: ... In order to prevent spreading the viruses to us and our family, we stayed indoors and avoided going outside.

Ayşe: Due to the outbreak, we stopped going out and instead stayed home more often. Also shuttered were the schools. We avoided crowded areas and weddings. We began to focus more on keeping ourselves tidy. For instance, after leaving the house, we washed our hands in lots of soapy water and hung our clothes to dry.

The students emphasize their conscious about nutrition and nutrition styles changed in the COVID-19 process. Also some student state that quality nutrition strengthens the immune system and makes it more resistant to diseases.

İsmet: Our eating habits changed. We took more dairy products, yoghurt, and cheese. We also ate a lot of vegetables and fruit. Our teacher said that if we eat a lot of vegetables and fruits in class, our bodies will be more resistant and we will not get sick easily. He said, we should not eat foods that are harmful to our health. Kenan: At home, we no longer eat the same things. We avoid eating at restaurants and buying packaged foods... Dinner always includes a veggie dish. By doing this, we make sure our immune system is robust. When we are ill, we focus on these in order to recover quickly from the illness.

Ayşe: ... Vitamin supplements were required to boost our bodies' resistance... We don't purchase packaged goods, I consume less junk food, and I avoid eating things like chocolate candy chips.

Gülcan: ... People with poor diets are more likely to contract the coronavirus because they have weakened immune systems, suffer more severe effects from the illness, or recover from it more slowly.

The fact that students do various exercises at home not to be inactive for a long time, and even watch videos on the Internet, can be considered as an important form of behavior and attitude towards a healthy lifestyle.

Fadime: I'm attempting to work out. I ride my bike during the day and occasionally go for walks. Whenever I have the chance, I perform these. I occasionally practice sports using gym equipment at home.

In addition, it can be seen that the current process affected the quality of sleep.

Hale: The way people sleep has changed. We slept in and got up later than usual.

3.2.2 Education

During the COVID-19 epidemic, students reported that their education was significantly impacted and that they had difficulty adjusting to distance learning, which they had never encountered before. Although there is a low proportion of positive opinions regarding this situation, negative opinions predominate. Figure 5 depicts the viewpoints regarding education.

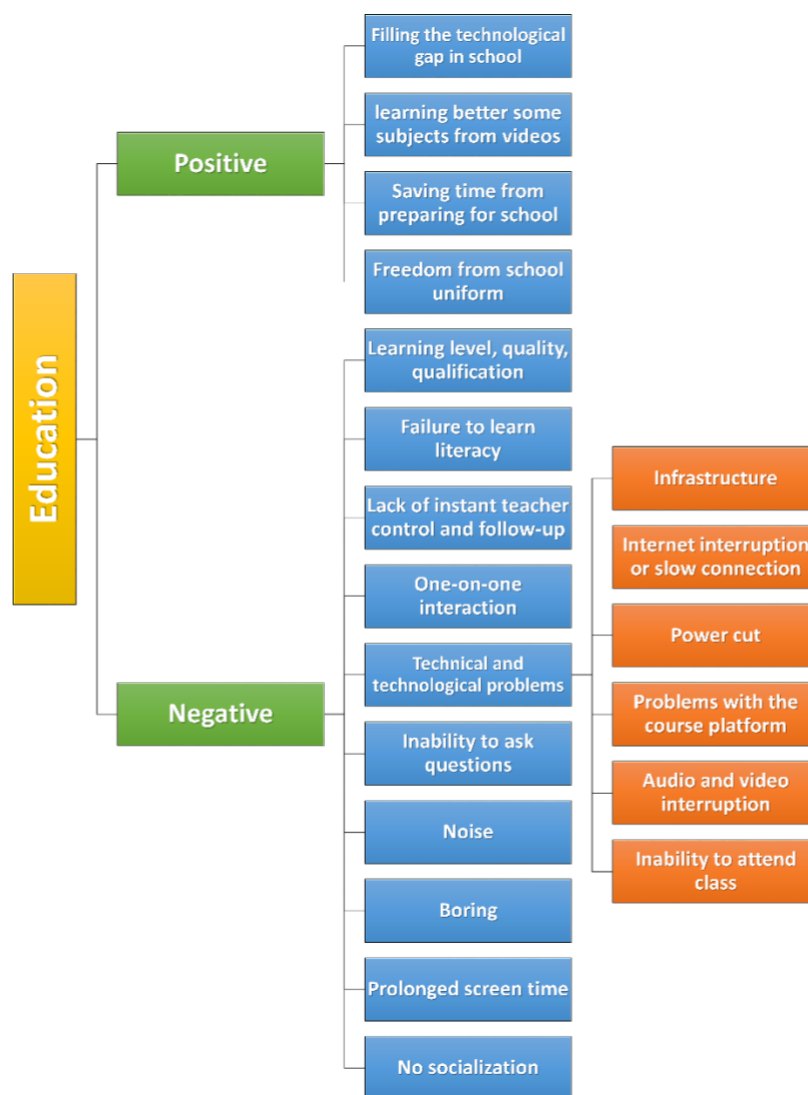


Figure 5: Changes in education under the COVID-19 process.

The students' opinions indicate that the school's technological infrastructure must be improved, that the lessons from the videos should be repeated in relation to the lessons, and that technology is not given enough space in the lessons, which has a positive effect on closing the achievement gap.

Gülcan: It was good in some respects and bad in others. For example, our school lacks a smart board. However, in online education, the instructor uses the computer to play movies, making the course more entertaining. Some knowledge is better learned through the use of videos.

In addition, saving time getting ready for school and being able to choose what to wear are positive aspects for students. Consequently, it can be stated that the epidemic has exposed educational processes to technology and created an environment conducive to incorporating technology into education. In reality, all educational actors had to undergo technological change to adapt as much as possible to the infrastructure requirements of the time.

Kenan: Some good, some bad. The good news is that we attended classes from home and were immediately in class upon rising. We were not wearing school uniforms; we were wearing tracksuits to class.

Regarding education, students hold rather negative opinions. The primary issues are the absence of the desired level of learning, the absence of immediate follow-up by teachers, technical and technological issues, the absence of an effective teaching environment, the disadvantages of long periods of screen time, inactivity, and the inability to interact with others. Healing the wounds caused by the epidemic process in education can take considerable time.

COVID-19 process disrupts almost all of the typical school and classroom dynamics. There are numerous instances of this, including classroom management, face-to-face interaction, socializing with peers, and satisfying the need for play and exercise.

Buse: It was terrible because it was not face-to-face. Because school lessons were more enjoyable. By observing, we were able to absorb more information; consequently, our instructor could care more.

Kenan: The downside is that learning has become more difficult, and we occasionally miss something in the subjects. Our instructor was unable to control us. Someone who has switched off their microphone-equipped camera may not be listening to the lesson. These were detrimental to learning.

Ayşe: The distance education was not very good. We do many things by ourselves at home and our teacher has no control over it. We could not use the internet, it froze and we got disconnected. Sometimes our voice did not work. Since we were in the village, the electricity was cut off. Since we could not go to school, we were idle at home...

Gülcan: Obviously, online education cannot substitute in-person instruction. There could be technological issues. No classroom atmosphere exists... The instructor cannot inspect our work. No longer can I see my buddies. It was preferable to attend school with them.

Özgür: Sometimes we do not comprehend the material, and we do not learn effectively. It differs from the classroom setting.

Hale: ... When we were in school, we were able to ask our teacher about topics we did not understand. It was more comfortable, and our comprehension was enhanced. Occasionally, the sound is cut off, and we cannot hear our teacher. He is unable to hear us. The system removes us from the course or prevents us from connecting. Communicating with our peers in class might lead to a variety of complications.

In addition, during the course of the epidemic, organizations at the state, provincial, district, and provincial levels, as well as schools and classes, discovered that educational stakeholders, such as teachers and students, were not adequately prepared to integrate technology and teach technology literacy. The technical and technological issues raised by the students can be viewed as a manifestation of the existing deficits.

Kenan: There have been significant changes to our school environment. We were unable to attend school; therefore, we were required to participate in distance education. There were numerous issues with the remote education. We weren't able to connect at the same moment, there was noise, there were disconnection issues, sometimes we couldn't hear our teacher or see the screen...

Rabia: It was quite challenging to teach the lessons remotely... Our teacher was unable to supervise our work.

Özgür: When we are constantly seated in front of a computer screen, our muscles ache and our eyes hurt. Our instructor cannot control us all at once.

3.2.3 Personal

Students were asked about changes in their daily lives during the COVID-19 process. The responses received are shown in Figure 6.

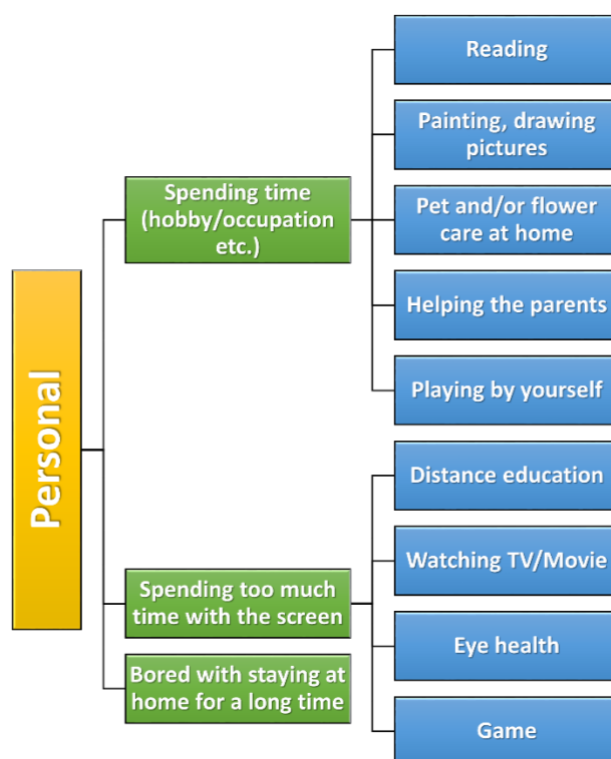


Figure 6: Changes in daily personal lives during the COVID-19 process

As shown in Figure 6, some students indicated that they pass the time with various activities. They mentioned reading books, taking care of animals or flowers at home, helping parents, painting, and playing or spending time alone as daily activities.

Hale: I go to school from home, study at home, read books, and play with my toys. I'm giving my mom a hand. I give the plants water. I only have one fish, which I look at. I watch it sometimes.

Buse: I can't hug the people I care about. I can't play games outside the way I want to. At home, I played games. So I wouldn't get bored, I watched movies and painted. I helped out my mom.

Seda: When I can't go out, I get bored at home... I played with dolls and played house games. I also did my homework and studied for my classes. I was painting, reading, and sometimes turning on the TV. I was able to stop being bored this way.

Some students stated that they spend too much time in front of the screen, which has good and bad effects. On the one hand, it pushed the transition to distance learning, and on the other hand, they spent more time with the screen because they spent time with technology in different ways.

Murat: Since we couldn't go anywhere, we spent more time on computers and tablets. This can hurt our eyes and other parts of our bodies. I play games and play with my toys when I'm not using my tablet or watching TV. I am doing my homework and reading a book.

Some students stated that they were bored at home spending time too much at home by necessity.

İsmet: We don't go out much. Most of the time, we stay at home. So, I get bored at home...

Gülcan: We spend time at home, I'm bored so much. Sometimes when I have time, I help my parents or play games by myself.

3.2.4 Social

Students' social lives can be affected by the COVID-19 epidemic process. Figure 7 shows different points of view that are similar.

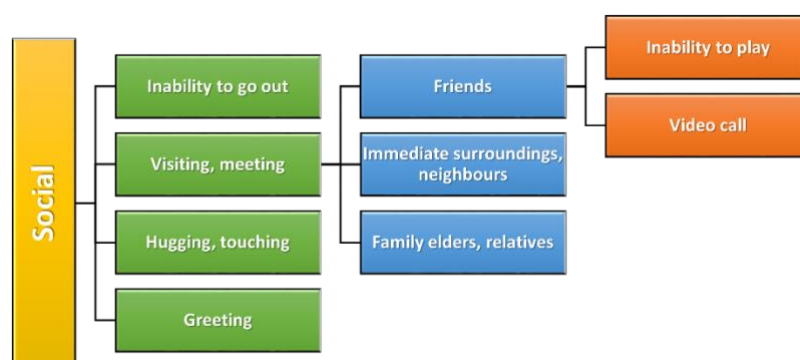


Figure 7: Changes in social life in the COVID-19 process

Students generally indicated that they were unable to meet with their friends, family elders, relatives, immediate surroundings, and neighbors.

İsmet: We can't go see our grandparents or our neighbors. I can't go to the park or play with my friends outside. Because of this disease, I can't travel or go hiking.

Yalçın: I've stopped hugging. How we say hello to each other has changed over time.

Ahmet: I miss playing with my friends, hugging my teachers, and being able to walk and run without pain.

Ayşe: We can't go see our old people because we're sick. We don't have a lot of time to go there. Even if we leave, we can't hug them because we have to keep them safe... My friends and I can't play together. I want to play with them again. A few times, we were able to get together with my friends through the internet.

They also spoke of not being able to go out of the house often enough, visits and meetings being limited, and hugs/contacts being kept to a minimum.

Beril: It wasn't as easy for us as it used to be because of the epidemic. We couldn't play outside whenever we wanted to anymore. We had to stay home. We couldn't see our friends. We weren't able to play games. We weren't able to go to school. When we went outside, we had to wear masks and stay away from people. We tried not to touch each other when we played with our friends at school. We each sat by ourselves at our own table. We sat on opposite sides of each other. We couldn't see our friends even when we went outside.

4. Discussion and Conclusion

In this section, the conclusions drawn from the research results are presented, examined in light of the relevant literature, and recommendations are offered.

The purpose of the study was to assess the effect of the COVID-19 outbreak on primary students' knowledge, behaviour, and awareness of "healthy living" in the life science course. Students have general understanding and awareness of "healthy living," according to the findings. Notable is the fact that students provided responses regarding the balanced use of sports, exercise, sleep, and technology, although focusing mostly on nutrition and cleaning issues relating to the factors that support and hinder healthy living. In this context, it can be argued that they placed great emphasis on the results of the Life Studies course and considered that they had incorporated them in their life to a significant degree. This might be viewed as evidence that the accomplishments and subjects related to healthy living are applicable in other classes, particularly Life Studies, which students have encountered at school. Çelenkolu (2019) stated that curricula containing content about healthy living should have fundamental goals such as (i) presenting core information about healthy living, (ii) developing behavioral models that support healthy living, and (iii) fostering an awareness of and a sense of responsibility for healthy living. In this sense, healthy lifestyle awareness and health literacy appear to be issues that should be introduced as early as possible and during primary school (Yılmazel & Çetinkaya, 2016).

Nonetheless, it has been discovered in several studies that students have favorable attitudes and ideas toward the life science course, and there is a correlation between the replies of participants and the attainments of the life science course (Oker & Tay, 2019; Tiryaki, 2018). These attainments also demonstrate the efficacy of the life

science course. In addition, it should not be forgotten that the COVID-19 epidemic process necessitates an environment conducive to the consolidation and application of classroom knowledge. In fact, Aydın's study (Aydın, 2021) indicated that children's cleaning habits improved, which is significant to support the relevance of the issue and the findings of this study. On the basis of the world's most significant epidemic experiences, it is imperative that all educational experiences, particularly those in the life sciences, develop the knowledge, skills, behaviors, and awareness of a healthy lifestyle. Because the pandemic has shown that it is crucial to comprehend and apply important skills in order to acquire current and reliable health information, evaluate health, and safeguard health (Şenyurt, 2021).

Students who participated in the study discussed both the advantages and disadvantages of distance education. In the context of education, it is evident that students typically describe distance education negatively. In addition to not having to prepare for school and not having to dress, students viewed the elimination of school's technological shortcomings as an advantage of distance education. In their study, Horspool and Lange (2012) discovered similar findings regarding daily preparation for school attendance and time savings associated with commuting. In addition, students indicated that they could fill in any gaps in their knowledge by watching the instructional videos later. In this context, Fidan (2020) and Yolcu (2020) reported comparable findings in their respective studies.

As for the disadvantages, students had a difficult time adjusting to full-time distance education, which they had never before experienced, and they struggled greatly to learn. Özdoğan and Berkant (2020) view the rapid and abrupt transition to distance education as a significant disadvantage due to the occurrence of the COVID-19 epidemic and its rapid spread across many countries. Due to the technical-technological deficiencies and problems encountered by stakeholders during the implementation of the distance education process, the distance education process has assumed a more complex and problematic structure. Many issues, such as the transition to distance education around the world, the fact that countries, societies, and families have never had such an experience with education, the deficiencies and problems experienced by countries in integrating technology into education, and the lack of technological competence among educational stakeholders, make the transition and adaptation to the distance education process challenging. In this context, the literature's studies support these findings. Serçemeli and Kurnaz (2020) found that students have trouble adjusting to and adopting distance education; Pürsün, Yapar, Aslantaş and Taşkesen (2021) found that students have negative attitudes toward distance education; Taşkıran and Altan (2021), Kaya (2020), Canpolat and Yıldırım (2020) reported problems such as irregular attendance, lack of motivation, and ignoring classes; Keskin and Özer Kaya (2020), Salman and Akay (2022), Terzioğlu and Yıkmış (2022), Koç (2018), and Gewin (2020) cited classroom management, insufficient communication, noise, feedback, and immediate follow-up as problems.

In terms of "healthy living", in addition to the full-time orientation of education processes to technology, an uncontrolled increase has been observed in the daily time spent with technology (Sun et. al., 2020). In this context, it can be said that long-term uncontrolled use of technology harms healthy life. At this point, while it harms the cognitive, linguistic, social, emotional and motor development of children (Pagani, Fitzpatrick, Barnett & Dubow, 2010), it triggers problems such as psychological stress, anxiety, anger, psychological distress, Internet addiction and depression (Dubey et.al., 2020). In terms of physical health, musculoskeletal problems (Kelly, Dockrell & Galvin, 2009; Yel & Korhan, 2015), inactivity and obesity (Sisson, Broyles, Baker & Katzmarzyk, 2010), sleep disorders (Levenson et.al., 2016) It is seen that it causes problems such as eye and vision disorders (Gökel, 2020). Therefore, it can be seen that technology, which is exposed with the COVID-19 process, is an important factor that affects "healthy living" from different aspects, both as distance education and spending leisure time.

With social isolation and quarantine periods, the process of the COVID-19 epidemic has passed. In the context of time management, that is, in a personal context, students provided differing responses regarding how these processes value their time. In this context, students responded that they play video games, watch movies and television on technology, read books, take care of animals and flowers, assist parents with housework, paint, and play video games during their time away from society, outside of class and homework. However, the COVID-19 epidemic has resulted in social isolation and quarantine, limiting children's play and exercise needs. This is especially important when it comes to gaining awareness, knowledge, and skills that improve and support life quality and health, such as utilizing rest and/or leisure time, having a job or hobby, and growing in various areas and skills.

Likewise, it is evident that the COVID-19 outburst process prevents students from socially interacting with their immediate environment. Students emphasize that they are unable to meet with friends, family elders, relatives, close friends, and neighbors and that this is a very negative circumstance. In this regard, the epidemic impedes students' socialization requirements (Aydın, 2021). It is well known that the need for socialization, relationships, and communication with close or distant individuals is crucial (Atay, 2005). Literature indicates that people's social skills improve as their social relationships and communication expand. In addition to activities like games, cooperative learning, and drama (Mantaş, 2014; Koç, 2015; Pekdoğan, 2016), contact with relatives, neighbors, peers, and friends (Tanrıverdi & Erarslan, 2015) and visits contribute to social development based on modelling and imitation learning. (Samancı & Uçan, 2017). In support of this claim, the study conducted by Sop and Demirgıran (2021) found that preschool children primarily depicted the games they played with their friends in a busy environment in their drawings about the games and that they formed friendships with their pets. Therefore, it is necessary to fill the socialization void created by the epidemic process. Consequently, addressing children's self-actualization and social needs during their preschool and school years, in their everyday lives and activities, and outside of school provides a framework that directly or indirectly promotes and supports healthy lifestyle awareness.

Clearly, the COVID-19 pandemic has affected people in various ways and from various viewpoints across the globe. This study examined the impact of the epidemic on students' daily lives under the categories of education, health, personal, and social. As components of personal and social integrity, all of these terms pertain to the concept of "healthy living" in the physical, psychological, emotional, and social senses. It becomes evident that general life and day-to-day dynamics are significantly affected by the epidemic process. In the context of knowledge, behavior, and awareness, it is essential that students deal with a variety of issues and their opposites, such as positive-negative and beneficial-harmful, at a level that can generate a number of codes. The continuation of online instruction may have exacerbated this situation during the epidemic and the constant exposure to news, information, and warnings about the epidemic from family, friends, and the media.

In parallel with what the global COVID-19 epidemic taught people, there has been a renewed emphasis on the need to teach healthy living awareness to young children in a variety of settings. At the same time, it is essential that all situations and problems that affect healthy living and are encountered in all societies as a result of the epidemic process be reconsidered in individual, social, psychological, and societal contexts, and that their boundaries be delineated and incorporated into the curriculum of relevant courses at all levels of education. Additionally, school, family, and community collaboration should be emphasized and strongly supported.

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Appendix A

Attainments related to "Healthy Living" in the Life Sciences Course Curriculum 2018

Grade 1 Attainments

Unit 1: Our School Life (1.1.)

1.1.8. Establishes a routine of using the toilet and cleaning.

It emphasizes how to use school toilets (going to and from the toilet, asking permission, and being sensitive to his and his friends' privacy while using the toilet).

Unit 3: Nutritious Living (1.3.)

1.3.1. He consistently takes care of himself.

Learn how to properly wash hands and faces, brush teeth, take a bath, comb hair, use the toilet, and put on and maintain everyday clothing. In addition, ensuring continuity in personal care is emphasized. Personal care requires efficient use of resources, according to the text.

1.3.2. He/she is aware of the precautions he must take to safeguard his health.

It discusses topics such as personal hygiene, dressing appropriately for the season, washing fruits and vegetables before eating them, playing sports, avoiding infectious diseases, using drugs responsibly, and the significance of visiting the dentist and doctor.

1.3.3 He/she chooses foods and beverages that are healthy for his body.

Emphasis is placed on the essential plant and animal foods that should comprise a balanced diet. While consuming a balanced diet, the health risks of discriminating food, consuming foods of unknown origin, and consuming products such as foods sold openly and/or on the street and carbonated beverages are emphasized.

Grade 2 Attainments

Unit 3: Nutritious Living (2.3.)

2.3.1. Understands the connection between healthy growth and development and personal care, sports, sleep, and nutrition

2.3.4. Explain the importance of cleanliness to a healthy lifestyle.

Personal hygiene and environmental cleanliness are emphasized.

2.3.5. Recognizes institutions and occupations that provide health services.

A great deal of emphasis is placed on hospitals, family health centres, pharmacies, and professions such as medicine, nursing, pharmacy, and dentistry.

2.3.6 Appreciates the health benefits of seasonal fruit and vegetable consumption.

Grade 3 Attainments

Unit 3: Nutritious Living (3.3.)

3.3.1. Utilizes resources effectively while providing personal care.

3.3.3. He is fed seasonal foods to preserve his health.

3.3.4 Adequate and balanced nutrition is necessary for health maintenance.

It is emphasized that a balanced diet is essential for healthy growth. Also highlighted are health issues such as obesity, diabetes, celiac disease, and food allergies. The importance of avoiding food waste is emphasized.

3.3.5. To protect his and the community's health, he follows the rules of cleanliness and hygiene in public areas.

The importance of using communal spaces, toilets, and sinks cleanly and hygienically is emphasized.

The Influence of Imagination and Creativity-Based Science Teaching on Turkish Middle School Students' Nature of Science Views*

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Abstract

This study aimed to investigate the influence of teaching materials that can enrich the views of middle school students about the role of imagination and creativity in scientific research. The study was conducted in a village middle school in Rize Turkey. It used a case study method within the scope of the qualitative research approach, seven activities were designed by the researchers toward the imaginative and creative nature of science (NoS). They were applied to the study group by the first researcher for twelve weeks. Data were collected with four open-ended questions and semi-structured interviews as also reflective writings and worksheets during the intervention. The NoS questionnaire and subsequent interviews were administered to participants twice, at the beginning and the end of the teaching. By using qualitative data, pre-post profiles of the students regarding the NoS were created. Each profile was classified using three-stage categories informed, transitional and naïve. It was concluded that students' naïve views on the imaginary and creative NoS changed towards transitional and/or informed.

Keywords: Nature of Science, Imagination, Creativity, Science Education

1. Introduction

Learning and teaching science have become one of the most basic conditions of education due to the innovations brought by technology and science (Cinar & Koksall, 2013). New educational policies that emerged in line with the goals and needs of today's societies focus on raising students as individuals with a high level of awareness in the field of science and technology (MoNE, 2005, 2013; Sarac, 2012). American Association for the Advancement of Science (AAAS) gave a broad definition of science literacy in "Science for All Americans" published in 1989 (AAAS, 1993). The concept of science literacy gained importance and started to spread to other fields, especially science education. Today, the vision of "raising scientifically literate individuals" has started to take place in the vision of science education programs implemented both in Turkey and abroad (Nwosu & Ibe, 2014; Yenice et al.,

* This paper was developed from the first researcher's master's thesis and under the supervision of the second researcher.

2015). For example, the vision of the new science teaching curriculum was determined as "training all students as science and technology literate" in Turkey (MoNE, 2013).

The NoS or the nature of scientific knowledge is one of the most important elements of raising scientifically literate individuals (Kucuk, 2006). To develop scientifically literate individuals, they must first understand the NoS correctly (Metin, 2009; Sevim, 2012). There is a strong relationship between students' awareness of the NoS and students' approaches to learning about science and the NoS (Hogan, 2000). Lederman (1992) defined the NoS as "the values and beliefs inherent in scientific knowledge". It includes four important disciplines such as philosophy, history, sociology, and psychology (McComas & Olson, 1998). There is no consensus on a specific definition of the NoS. Despite this, scientists have reached a consensus on what elements of the NoS should be at the center of studies on science education. In this way, some elements related to the NoS that students can achieve at all levels, from pre-school to university level, have been developed (Abd-El Khalick et al., 1998; Bell et al., 2000; Deboer, 2000; Lederman, 1992). One is that scientific knowledge is partly the product of human inference, imagination, and creativity (Abd-El Khalick et al., 1998). The imagination and creative NoS are the most important dimensions of the NoS. Scientific research often involves using logical reasoning and imagination to construct hypotheses and explanations and collecting relevant evidence to make sense of the data collected (AAAS, 1993). Science is mostly a human endeavor, and scientific study is based on fundamental human qualities such as reasoning, understanding, energy, skill, and creativity (NRC, 1996).

The main purpose of science education is to define problems that individuals notice in their close environment, to make observations about them, to make hypotheses, to conduct experiments to test their hypotheses, to analyze the results obtained, and to apply the necessary skills to solve the problem. Science is not only a product but also a process that takes place in every step of an individual's life and includes the creativity component to a large extent (Trnova, 2014). For this reason, children should be raised to have the ability to question the information taught to them and to predict the subject areas that can use this information. This skill can be provided by giving them the awareness of creativity (Akcamlar, 2007). It is revealed that the students mostly have inadequate views of all the dimensions of the NoS (Deve, 2015; Kucuk, 2006; Sener-Canli, 2018). It has been determined that the research covered more than one dimension of the NoS, but there is no in-depth research on a single dimension. It is thought that examining the dimensions of the NoS, which is one of the most important elements of science teaching, one by one and designing teaching materials accordingly will be beneficial both in terms of providing resources for the relevant field and in terms of students' understanding of the imagination and creative NoS.

The basic goals of science education are to train individuals who have informed views on the nature of scientific knowledge as well as scientific literacy. However, it was revealed that the concepts of science teachers, pre-service teachers, and primary and secondary school students about the NoS are quite "naïve" (Eve & Dunn, 1990; Johnson & Peeples, 1987; King, 1991; Zimmerman, 1991). Moreover, especially primary school students have naïve views about the experimental, imprecise, inferential, creative and imaginative nature of scientific knowledge (Griffiths & Barman, 1995; Kucuk, 2006; Kucuk & Beyaz, 2022). The perception of the NoS by students is important in terms of structuring scientific knowledge correctly in their minds (Sener-Canli, 2018). No consensus has been reached on a common definition of what science is, but some common values and characteristics related to the nature of scientific knowledge have been accepted (Abd-El Khalick et al., 1998). One of them is the imaginative and creative nature of scientific knowledge. It draws attention in the first place that the views of the students about the imaginative and creative NoS are not informed. Studies conducted at the national level also showed that students have naïve views on the imaginative and creative nature of science (Cil, 2010; Deve, 2015; Kucuk, 2006; Sener-Canli, 2018). The critical role played by the imaginative and creative NoS in the production of scientific knowledge is not known by the students. However, it was observed that students could not explain that scientists are individuals with a wide imagination and creativity and that they benefit from these features at every stage of their work (Deve, 2015; Sener-Canli, 2018). It is necessary to examine all dimensions one by one and in-depth and to prepare instructional materials for each dimension. There are not enough teaching materials for the related element of the NoS. In this context, it is believed that the activities produced by integrating each dimension of the nature of science in general, and the imagination and creativity examined in particular, can provide positive outputs in classroom practices. Based on these reasons, in the current study, teaching materials that can enrich

middle school students' views on the role of imagination and creativity in scientific research were designed and their influence was examined.

The research questions of the study are below:

- 1) What are the students' views on the role of imagination and creativity in scientific research before teaching?
- 2) How students' views on the role of imagination and creativity in scientific research have changed after the teaching?

2. Method

The study is a case study since students focused on the imaginative and creative NoS and in-depth research has been made using multiple data collection tools (Cepni, 2018). Seven teaching activities were designed to enrich students' views on the role of imagination and creativity in scientific studies based on worksheets (Patan, 2019). They were developed by the explicit-reflective approach. This method has also been used in many national studies (Kucuk, 2006).

2.1. The study group

The study group consisted of a total of fifteen students studying in the 7th grade of a middle school in Rize, a province in the northeast part of Turkey. The average age of the students was 13. Ten of them are girls and five are boys. The school is also an educational institution where students who are transported from the villages by vehicle, as well as students coming from the Eastern and Southeastern Anatolia Regions for board Quran course education.

2.2. The Intervention

In the design process of the activities, the targeted gains for the related element of the NoS were taken into account. In this way, the general gains of the teaching materials were determined as "understanding that scientists benefit from their imagination and creativity in their scientific studies" and "making them comprehend that scientists are individuals with imagination and creative features". In these activities, it was tried to show the reflections on the role of imagination and creativity in scientific studies by going through the scientific studies of scientists in general. The teaching materials allowed students to work individually or in groups, encouraged them to prepare models, and supported the activities with worksheets and homework. Teaching was applied by the first researcher, who is also a science teacher at the same school. The activities were held during the normal course day and mostly in Physical Education and Sports classes. The application of the teaching about the role of imagination and creativity in scientific research was completed in twelve weeks.

For example, the first activity (Which one is in the center? Earth or Sun?) was completed in three phases and 40 minutes. At the beginning of the activity, the students were asked, "What is science?" and "How do scientists work?" By asking questions, they were expected to brainstorm on the subject. First, a worksheet was given to the students regarding the activity, and questions about the universe they lived in (for example, "What do you know about the universe we live in? Do you think the universe we live in has a center?") were asked. Then the sentences "Earth-centered universe" and "Heliocentric universe" were reflected on the board, and they were asked to discuss what these sentences meant with their friends and to draw these two sentences on the activity worksheet visually using their imagination and creativity. Each group was then asked to present their thoughts on these two universe models, together with their drawings, and to present their views on which of these universe models are valid today, along with their reasons. In the second stage of the activity, one colored envelope was given to the groups, and they were asked to identify the life of the scientist, the paradigm on the subject, scientific studies, the difficulties they experienced during the research, and to write the data they obtained in the relevant place on the activity sheet. Each scientist was given seven minutes for life, and after the time expired, each group alternately changed the envelopes. The scientists inside the envelopes are Aristarchus of Samos, Aristotle, Ptolemy, Kepler, Copernicus, and Galileo. In the last stage of the activity groups recorded the scientific life of six scientists, their paradigms

related to the subject, and the data they obtained, the groups were asked to draw a concept map regarding the universe models and to place the scientists in the places in this concept map based on the data they obtained. Now, what is expected from the groups is to gather the scientists who support the geocentric universe model under one group and the scientists who support the heliocentric universe model under the same group. Finally, the views of the students about the change in the universe model were taken. They were asked to explain why the universe model has changed from past to present, what problems scientists have experienced in the historical process, based on the data they recorded, and to refer to the importance of imagination and creativity in the change of scientific knowledge.

2.3. Data Collection

Four questions directly from the "Nature of Science Student Questionnaire" developed by Abd-El-Khalick (1998) and adapted by Khishfe and Abd-El-Khalick (2002) were applied twice, as pre-post tests, to reveal the views of the students in the study group about the role of imagination and creativity in the scientific research process and to determine the changes that occurred after the teaching activities designed by the researchers. Semi-structured interviews and students' reflective writings were also used as data collection tools. The interview questions are:

1. Dinosaurs lived millions of years ago.
 - (a) How do scientists know that dinosaurs lived?
 - (b) What evidence do scientists use to explain what dinosaurs looked like?
 - (c) Do you think scientists are confident about what dinosaurs looked like? What makes scientists confident or skeptical about this topic?
2. What does imagination mean to you? Give an example.
3. What does creativity mean to you? Give an example.
4. Scientists try to find answers to their questions by doing research/experiments. Do you think scientists use their imagination and creativity in their research/experiment? Explain your answer with an example.

2.4. Analysis of Data

The NoS profiles of the students related to the role of imagination and creativity in scientific research were created based on the questionnaire and subsequent interviews with them (Khishfe, 2004; Kucuk, 2006; Kucuk & Beyaz, 2022). To analyze all the data a rubric was created by the researchers and student responses were evaluated according to the rubric (see table 1). The worksheets and reflective writings were examined together and categorized as "naïve", "transitional" and "adequate". While categorizing, was paid attention to whether there were reflections on the role of imagination and creativity in scientific studies in the worksheets and reflective writings. Both the validity of the questionnaire data and the reliability of the obtained profiles were ensured by the two researchers in a panel. This analysis method was also used during the creation of the final profiles of the students after the teaching. Students' views on the role of imagination and creativity in the scientific research process were categorized as naïve, transitional, and informed. Based on the responses by the students to the four questionnaire items, their views on the NoS were explained. To categorize students' views on the role of imagination and creativity in scientific research as "adequate", they were asked to give consistent and correct answers to all questions and present evidence. If the student could not put forward an adequate view of the relevant element of the NoS, he or she was categorized as "naïve". If the student expressed informed views on some items but not all items, they were categorized as "transitional". This categorization method was also used in the studies conducted by Kucuk (2006), Ayvaci (2007), Cil (2010), and also Kucuk and Beyaz (2022).

Table 1: The rubric for the role of imagination and creativity in the scientific research

Informed	Transitional	Naive
- aware that imagination and creativity are personal characteristics of scientists,	- not aware enough that imagination and creativity, which are the personal characteristics of scientists, are	- unaware that imagination and creativity are personal characteristics associated with scientists,

- makes definitions not only for new technology but also for a new knowledge-generation process, - knows that personal characteristics such as imagination and creativity are as important as experimental data and methods in the process of producing scientific knowledge, - knows that personal characteristics such as imagination and creativity are actively used at all stages of the scientific research process and gives appropriate examples.	effective in the scientific research process, - defines only the process of producing new technology, - states that experimental data and methods are often important in the process of producing scientific knowledge, - knows that imagination and creativity are actively used in some stages of scientific research and gives partially appropriate examples.	- makes only classical definitions for the process of producing new technology, - does not know that personal characteristics such as imagination and creativity are as important as experimental data and methods in the process of producing scientific knowledge, - does not know at what stage of the scientific research process personal characteristics such as imagination and creativity are actively used and does not give appropriate examples.
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3. Results

The analysis of the data obtained from the research conducted before, during, and after the teaching related to the NoS is below. The first views of the students about the role of imagination and creativity in scientific research are presented below, in table 2.

Table 2: Initial views of students about the role of imagination and creativity in the scientific research

Participant Codes	naive	informed	transitional
E1	X		
K1	X		
E2	X		
K2	X		
E3	X		X
K3	X		
K4	X		
E5	X		
K5			X
E6	X		
K6	X		
K7	X		
K8			X
K9	X		
K10	X		

K: Female E: Male

It is seen from table 2 that there are no students who have "adequate" views. Three of them had "transitional" views about the role of imagination and creativity in the scientific research process and the others had naïve views.

In the first question they stated that scientists knew that dinosaurs lived with the help of fossils:

"Scientists know from fossil remains from past years that dinosaurs lived" [E3]

"They searched and found bones or footprints or bones belonging to the wreckage as a result of research from the past" [K7].

In the second question of that which evidence was used regarding the images of dinosaurs, the role played by the evidence in the creation of dinosaurs was not understood in both the interview and the questionnaire

conducted by them. Three students explained that imagination and creativity are used by scientists to the question “if the dinosaurs could not be observed directly, how could their models have been created?”

“They find dinosaur fossils and then use their imaginations to assemble the pieces” [K5]

“They make models of dinosaurs by imagining” [E3]

In the third question, it was asked whether scientists were sure about what dinosaurs looked like. The students explained that the scientists were sure of the images of dinosaurs and were not in any doubt:

“Dinosaurs are similar to each other and that's why scientists tell the truth [K3]

“Scientists, I think, are sure of the shapes. Because everything science tells us is true [K4]

There is a question in the questionnaire of that “What do imagination and creativity mean to you? Give an example.” It was determined that the students could not explain the terms imagination and creativity, and they tried to express imagination and creativity by referring to a certain object or event, not in the sense of producing an idea or knowledge. In this context, it was determined that the students did not have “informed” views on the question:

“It expresses my future” [E5]

“It allows us to be creative” [K4]

“It is the invention we want to make in our minds” [K5]

In the last question of the questionnaire, the students were asked whether scientists use imagination and creativity in scientific research and were asked to give an example. Just one of them stated that imagination has a place in the conclusion of scientists' research and experiments:

“I'm thinking. For example, they make inventions such as telescopes, the telephone, and television with their imagination. For example, Galileo invented the telescope, and Edison invented the light bulb. Scientists make use of their dreams while finding new information and going to the conclusion of their research and experiments” [K5]

Two students stated that scientists use their imagination to produce scientific knowledge, but they could not give an example to support their statement:

“Yes, scientists use their imaginations in their work and come up with new information that no one else has found” [E3]

One week after teaching, the questionnaires and interviews were applied to the students again. Each of the measurement tools was analyzed one by one and the results are presented below.

Table 3: Students' final views on the role of imagination and creativity in the scientific research process

Participant Codes	naïve	informed	transitional
E1			X
K1	X		
E2		X	
K2		X	
E3		X	
K3		X	
K4			X
E5	X		
K5		X	
E6		X	

K6	X	
K7		X
K8	X	
K9	X	
K10		X

There were no students who had "informed" views on the role of imagination and creativity in scientific research at the beginning. The number of students who had "informed" views about the role of imagination and creativity in scientific research increased to nine. In particular, the questions given in the questionnaire were "explaining what dinosaurs looked like" and "do scientists use their imagination and creativity in producing scientific knowledge?" It was determined that they also gave more "informed" explanations in their answers to the questions. In the first question asked to them in the questionnaire, "how do scientists know that dinosaurs lived", 13 students explained that they could know this with fossil remains. In the second question, it was mentioned which evidence was used about the images of dinosaurs, and it was seen that the role played by the evidence in the creation of dinosaurs was not understood in the questionnaires and interviews made before teaching. When the question "If dinosaurs cannot be observed directly, how could they have models created, what evidence do scientists use to describe what dinosaurs looked like?" was asked only three students explained that imagination and creativity were used together with fossils to create images of dinosaurs. However, the number of students increased to 13 in the questionnaires and interviews after teaching.

"They use the bones. They combine these bones by using their imagination" [K2]

In the question of "Are scientists sure about what dinosaurs looked like?", 13 students stated that scientists might have doubts and were not sure about the images of dinosaurs. In the questionnaires and interviews conducted after teaching it was determined that they had more "informed" views. "They may not be sure because they haven't seen dinosaurs before"[K7]

Ten students made "informed" explanations about the terms "imagination" and "creativity". Before teaching, they tried to explain the terms creativity and imagination by referring to things and objects rather than referring to a scientific event, so their answers were considered "inadequate":

My imagination is to find new ideas and come up with new scientific information. We use it for science. For example, imagination was used while making the atomic models we saw in the lesson. People did not see the atom, but they made its model" [E2]

The last question was about whether scientists use their imagination in producing scientific knowledge. Before teaching, they could not make adequate explanations for this question. It was determined that nine of them understood the role played by the imaginative and creative nature in producing scientific knowledge at the end of teaching.

Imagination takes place at every stage of scientists' work. They always make use of their imagination in their scientific research, while revealing new information and inventing. If they don't have dreams, they can't do new and different things. For example, models of atoms have changed constantly. Scientists have worked on the atom at different times, and each scientist has put forward different views. They [Scientists] interpreted the atom differently. Because they use their imagination" [K5]

In this section, the change in students' views on the role of imagination and creativity in scientific research is explained. Daily NoS profiles were produced from the analysis of reflective writings and also worksheets after each activity and are presented below in table 4.

Table 4: The distribution of students' views on the role of imagination and creativity in scientific studies throughout the teaching

Students Codes	Pre-test and Interview	Activity 1 worksheet and reflective writings	Activity 2 worksheet and reflective writings	Activity 3 worksheet and reflective writings	Activity 4 worksheet and reflective writings	Activity 5 worksheet and reflective writings	Activity 6 worksheet and reflective writings	Activity 7 worksheet and reflective writings	Post-test and Interviews
E1	-	-+	-+	+	-+	-+	-+	*	-+
K1	-	-	-+	-	-	-	-+	*	-
E2	-	-+	+	+	-+	+	+	*	+
K2	-	-+	+	+	+	-+	+	-+	+
E3	-+	+	+	+	-+	+	+	*	+
K3	-	+	+	+	+	+	+	+	+
K4	-	-+	-+	+	+	-+	-+	-+	-+
E5	-	-	-+	-	-	-	-	-	-
K5	-+	+	-+	+	+	+	+	+	+
E6	-	+	+	-+	+	-+	+	*	+
K6	-	+	+	+	+	-+	+	*	+
K7	-	-+	+	+	-+	-+	-+	+	-+
K8	-+	+	+	+	+	+	+	+	+
K9	-	+	+	-+	-+	+	+	*	+
K10	-	+	+	+	-+	+	+	*	-+

***(-) naïve; (-+) transitional; (+) informed; (*) not attending the class**

The activities were analyzed by referring to student worksheets, models prepared by students, and student reflective writings.

In the first activity “Dinosaur Map”, it was determined that ten students were able to express those scientists have different imaginations.

In this activity, we saw that scientists are hardworking, imaginative people, and their thoughts and perspectives are not the same [K5]

Eight students also stated that scientists use their imagination and creativity in scientific research. We put forward theories about the extinction of dinosaurs using the data we have. We have attributed different meanings to the data in our hands. Because we all have different imaginations. Scientists come up with new theories thanks to their imagination [E6]

Seven students stated that group work reveals different perspectives.

We split into groups. We placed dinosaurs in different parts of the maps. The different ideas in the group made us come up with a more logical approach [E2].

In the second activity “Atomic Models”, ten students explained that imagination and creativity contribute to the emergence of new scientific knowledge.

Since scientists do not see atoms, they put forward hypotheses. They use their imaginations. [K5]

Three students said that scientific knowledge can change over time.

We learned that scientists came up with new ideas as time passed. I realized that because everyone's imagination is different, so many views arise. Imagination is important [E5]

Seven students also explained that scientists have different perspectives and gave examples.

Everyone's thoughts, perspectives, and imaginations are different. This led to the emergence of different models of atoms. Atom is the same, everyone interpreted it differently. Thomson likened the atom to a "raisin cake", and Rutherford likened it to the solar system [K7].

In the third activity "One Light, Multi Color", nine of the students stated that scientists use their imagination and creativity in their work.

While Aristotle and Alverni lived in the same period, they put forward different theories about the formation of rainbows. They progressed their work differently from each other. The most important reason for this is that they have different imaginations [K6].

Five students gave examples from the work of scientists.

While working on the formation of the rainbow, one scientist used a raindrop and the other used a glass prism and sphere. The experimental tool they both use is very different [E1]

In the fourth activity "Which one is in the center? Earth or Sun?" ten of the students stated that imagination and creativity play a role in the progress of scientific studies.

I learned that imagination and creativity are different for everyone. This is how scientists work. We learned about the life of scientists [E3].

Seven students also stated that scientists use their imagination and creativity in their scientific studies.

Our teacher handed us a paper. This paper had questions about astronomy. Then she gave us an envelope with different scientists. Some of these scientists advocated the geocentric model, while others advocated the heliocentric model. Even though we all look at the sky, we see different things. This shows that our imagination is different. [K6]

All seven students in the activity stated that imagination and creativity helped to reveal different views. For example, some scientists defend the geocentric universe, while others defend the heliocentric universe. In other words, we understand that everyone's thoughts, perspectives, and ideas are different. It comes up with imagination and creativity in different ideas [K2]

In the fifth activity "In the Mystery of Cards," nine students stated that scientists have different imaginations.

With this activity, I learned that not all of us think the same and that our dreams affect our knowledge [E4]

Seven students also stated that scientists use their imagination and creativity in scientific studies.

I learned that we need to have a big imagination in every subject, and activity and that we always use our imagination, which is important when we work like scientists [E6].

Seven students also stated that group work reveals different perspectives.

When our teacher gave us the first envelope in the lesson, we both used our old knowledge and imagined a little while sorting the animals. We thought about which animal we could put where. No group's ranking was the same in the first stage. Because I realized that even though we all look at the same thing, we can say different things. This is because our imaginations are different from each other [K9]

In the sixth activity "The data Beyond the Sky" nine students stated that scientists have different imaginations.

We saw that scientists have designed different telescopes from the past to the present, starting with Lippershey. Some used lenses, and some used mirrors. Because while making their designs, they make use of the old knowledge and imagination from the past [K5]

Six students also stated that scientists use their imagination and creativity in scientific studies.

I learned that scientists use their imagination and creativity while working. Lippershey invented the first working telescope, and then Galileo developed the telescope to observe the sky and collect data. For example, Newton used the mirror to make a telescope [E6]

In the seventh activity “The Story of the Light Bulb”, seven students stated that scientists have different imaginations.

I learned how to work like a scientist by making our light bulbs. We worked as a group using our imagination [K2]

Six students also stated that scientists use their imagination and creativity in scientific studies.

I learned that scientists have different imaginations and they use them in their studies. For example, Tesla and Edison both made light bulbs and they both have different light bulbs. Tesla designed a pin bulb. Edison did more than 1000 experiments for his light bulb and invented the light bulb with the yarn of the jacket button. Both of them designed different light bulbs with different experiments [K8]

4. Discussion

In this study, we aimed to design seven teaching activities and investigate the influence of them that can enrich the views of middle school students about the role of imagination and creativity in scientific research. There is a need to enrich students' views on the value of imagination and creativity, which are among the personal characteristics of scientists and play a major role in all stages of scientific research (Kucuk, 2006). We created the pre and post-profiles for the imaginative and creative NoS by questionnaire and semi-structured interviews (see Tables 2 and 3). In this way, we examined to what extent the teaching was able to reveal the expected effect on students' views. Table 1 revealed that 12 of the 15 students had "naïve" and three had transitional views on the role of imagination and creativity in scientific research before teaching. This result coincides with many studies conducted in Turkey with the same grade levels (Deve, 2015; Kucuk, 2006). It is striking that students did not know scientists are individuals with high imagination and creativity, actively use their imagination and creativity at every stage of scientific research, and also those individual characteristics are as important as experimental data and research methods as in the other research done by the second researcher in 2006 (Kucuk, 2006).

The profiles of the students about the relevant element of the NoS were reconstructed throughout the teaching (see table 4). The qualitative data obtained from the worksheets and also reflective writings revealed how the profiles developed throughout the teaching. Tables 3 and 4 revealed that the initial "naïve" views developed towards "informed" views. They are aware that imagination and creativity are personal characteristics of scientists, and they defined not only a new technology but also a new knowledge production process, they know that personal characteristics such as imagination and creativity are as important as experimental data and methods in the process of producing scientific knowledge. It was also observed that personal characteristics such as imagination and creativity were actively used in all stages of scientific research with appropriate examples. They learned that imagination was used while making the atomic models. Because scientists use their imagination and creativity when interpreting (inference) the data they obtain at every stage of their scientific studies (McComas, 1996).

The activity outputs evaluated in three categories reflect “informed”, “transitional” and “naïve” views in detail. It is striking that the number of students with "informed" views varies depending on the content of the activities. For example, the activities with the highest frequency of students with "informed" views were "Atom Models/

Journey to the Unknown", "One Light, Many Colors" and "From the Sky". It can be said that the activities in which the topics are included in the formal science curriculum during the teaching semester are contributed to the active participation of the students. In this way, it is clear that NoS activities that integrate the science subject area are more effective in enriching students' views on the role of imagination and creativity in scientific research. Similar results were obtained in other previous studies (Khishfe, 2004; Kucuk, 2016). This means that the context provides the rationale for learning and it links the physical world to scientific ideas in a similar way to practical work (Kazeni, 2012; King & Ritchie, 2012).

The worksheets and reflective writings for each activity revealed that some activities for example "The Mystery of the Cards" and "Which one is in the center? Earth or Sun? made limited contributions to the NoS views. Table 3 shows that the number of students who have "informed" views in these two activities is only seven. The reason is most probably due to students' lack of knowledge about the content. There is a need to establish clear and direct connections between the studies by students and those of scientists, which can reveal the effect of imagination and creativity (Kucuk, 2006). The subject area knowledge of the students is sufficient for these connections to be established.

5. Conclusion

It is very difficult for students to learn that scientific knowledge includes imagination and creativity (Dogan, 2010). Because students generally think that science has a neutral structure and that imagination and creativity are not used in producing scientific knowledge (Lederman, 1992). In the current study, it was determined that nine of the students whose initial views on the imagination and creative nature of science were analyzed as "naïve", made progress toward the "informed" level at the end. In line with these results, it can be argued that although the intervention could not reveal the expected greater impact on all students' views on the role of imagination and creativity in the process of scientific knowledge, it could still be considered successful in terms of the study group, which is quite heterogeneous in many aspects such as religious values, socio-economic structure, and others. There is also a close relationship between the aspects of the NoS, it is concluded that it may be more beneficial to teach each of them together instead of trying to teach them separately. It is in question that students can more easily associate the NoS activities with the related element of the nature of science on topics with higher subject area knowledge.

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Self-Efficacy Perceptions of Secondary School Students regarding Speaking Skills

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Abstract

The current study aims to investigate the self-efficacy perceptions of secondary school students regarding speaking skills according to various variables. The study was designed in the survey model, one of the quantitative research methods. The study group consisted of 434 students, 212 females and 222 males, studying at the 5th, 6th, 7th and 8th grades of Bartın Borsa İstanbul Secondary School. The self-perceptions of secondary school students regarding speaking skills were examined according to gender, grade level, success in Turkish lessons, number of siblings, and educational status of parents. To this end, "Personal Information Form" and the "Speaking Self-Efficacy Scale" developed by Hasırcı Aksoy, Arıcı and Kan (2021) were employed for data collection. The data of the study was analyzed via SPSS 21.0. As the data was distributed normally, parametric tests were employed in the analyses. Independent groups t-test was applied for two variables and one-way analysis of variance was applied for more than two variables. According to the research findings, secondary school students have high level of self-efficacy perceptions towards speaking; there is no significance in these perceptions in terms of gender, grade level, number of siblings and mother's education level; yet there is a significance in terms of the success in the Turkish lesson and the educational status of the father. Accordingly, it was found that as the course achievement of the participants and the father's education level increased, self-efficacy perceptions towards speaking increased.

Keywords: Speaking, Self-Efficacy, Perception, Secondary School Students

1. Introduction

Language is one of the essential means in expressing ideas, feelings and desires in human life (Arfani & Sulistia, 2019). It fulfills this task through basic skills classified as comprehension and expression skills, and thus it becomes concrete rather than an abstract concept. Speaking, which is included in the expression dimension of basic language skills, is particularly an important skill that individuals apply in many areas of life, especially in daily communication, and stands out with its various advantages for both the speaker and the listener if it is used correctly and eloquently.

Speaking, which is acquired after listening in the language learning process (Güneş, 2014), is used by people to communicate with others in their daily lives. It is defined in multiple ways such as the activity of sending and receiving messages (Huebner, 1960 cited in. Iftakhar, 2012), the process of forming and transferring meaning via

verbal and nonverbal signs in different contexts (Chaney & Burk, 1998), a skill in which the need to communicate with the environment is fulfilled by transmitting messages through spoken language (Sihotan et al., 2021). According to Bahadorfar and Omidvar (2014), who point out that speaking is an important part of daily interaction, most of the time an individual's fluent and comprehensive speaking ability creates his/her first impression. Again, according to Miyauchi (2022), speaking skills give the first impression to others in real-life cases and are generally evaluated first by other individuals in the globalized world. It is crucial to form the eloquent speaking skills of individuals from early years, as it is the basis of quality communication and the first skill to be evaluated by other people. In this sense, the development of this skill is a prerequisite for success in many areas of life.

According to Güneş (2014), who emphasizes that speaking is not only an interactive process consisting of the transfer of feelings and thoughts, this skill is also an important area for developing learning, understanding, mental, emotional and social skills. Students comprehend a lot of knowledge by speaking, thus this process develops their speaking and cognitive skills. According to Öztahtalı and Şahin (2020), it is essential for students to realize the speaking problems they encounter during their education process and to have knowledge about their effective speaking skill levels, and to raise the consciousness of their speaking proficiency in order to ensure an academic achievement. One of the essential human abilities, speaking is also able to bring the mutual communication skill to the desired goal if it is used correctly and effectively. Considering all these views, it can be suggested that the way for students to be successful in their social and academic lives is to be successful speakers.

Although it is believed that acquiring the speaking ability in the mother tongue does not require an academic education at the first stage, the speaking skills of the students should be improved with the methods and techniques developed for how to use this skill in the most effective and correct way in the school environment, and it should be aimed to use the language effectively by the students (Kurudayıoğlu & Güngör, 2017). Since speaking is an extremely complex activity as a productive skill, factors such as grammatical accuracy, use of vocabulary, and clear pronunciation should be considered by students in classroom conversations (Sundari & Dasmo, 2014). At this point, teachers have the most significant duty and responsibility. In addition to being an example to students in effective speaking, teachers should also work to provide them with basic knowledge and skills. In the process of learning and teaching, teachers need to consider a number of factors that affect this process in terms of developing students' speaking abilities. Elements such as oral production, communication process, number of listeners, interaction patterns, amount of information processed, time interval, teacher, student and the conditions under which they interact are only a small part of improving speaking skills (Vilimec, 2006). In addition, pupils advance their formal speaking when teachers provide insights on managing their thoughts for presentation. They are able to speak better when they are chronologically and thematically able to manage their presentations in various methods. To this end, they need to practice managing their speech about troubles and resolutions, cause and effect, similarities and distinctions (Wallace et al., 2004). For this reason, in the process of transforming knowledge into skill, students should be given plenty of activities in the classroom environment and they should be enabled to gain experience in expressing themselves.

In order to allow students to get involved in classroom speaking activities, it is important to first make them willing to participate in these tasks. It is essential to support the theoretical knowledge to be transferred to the students and the appropriate physical environments to be provided with psychological elements. According to Güneş (2014), the psychological characteristics of the individual, emotions such as anger, fear and joy are reflected in the speech, and the tone of voice, speed and words used are also effective factors. In other words, the individual transfers his inner world to sounds and words during speech. This is also reflected in gestures and facial expressions. At this point, teachers need to make pupils want to have a speech, to encourage them and to make them feel confident (İşcan, 2015). According to Hamzadayı (2019), emotional dimensions along with cognitive and physical dimensions play a decisive role in a successful speaking process or in the origin of the troubles experienced in this process. One of the effective qualities that have an influence on the success of speaking is self-efficacy (SE).

The concept of SE (Sundari & Dasmo, 2014), which is accepted as a compatible predictor of students' motivation and learning techniques (Au & Bardakçı, 2020) and first introduced in Bandura's Social Cognitive Theory (Sundari & Dasmo, 2014), refers to individuals' belief in their ability to arrange and perform the actions required to produce specific acquisitions (Harris, 2022); individuals' sense of self-confidence about their success in a task (Jinks &

Morgan, 1999), beliefs about their abilities that will enable them to be successful in a job they are trying to perform (Linnenbrink & Pintrich, 2003). SE, which has recently evolved an critical variable in social and psychological research (Gekas, 1989), is considered as a strong determinant of one's efforts, strategies, further learning and work performance (Heslin & Klehe, 2006) and an important factor that needs to be taken into consideration in cases where pupils often lack confidence and motivation (Harris, 2022). In respect to this, it is vital to investigate and reveal students' SE perceptions.

Individual's self-beliefs about efficacy affect thought patterns that can improve or weaken performance (Bandura, 1992). Various studies on behavior change reveal a meaningful linking between SE perceptions and academic behavior (McCarthy et al., 1985), and show that students' SE beliefs are strong predictors of their academic achievement (Pajares et al., 2007). The perception of SE, which guides student participation through cognitive and behavioral ways (Kim & Shin, 2021), affects students' motivation, activity choice, and willingness to participate in a job (Sundari & Dasmo, 2014; Dixon et al., 2007), and forms the basis for psychological well-being and personal success (Pajares et al., 2007).

SE is a vital personal difference variable in education. It is believed that pupils with higher SE have less anxiety, behave more persistently when encountered with challenging assignments, are more motivated during in-class exercises and spend more effort on tasks (Mills, 2014; Zimmerman, 1999). According to Heslin and Klehe (2006), a higher level of SE directs individuals to work, fight in the face of difficulties and to be persistent. Deci and Ryan (1987) report that having a high SE perception will provide positive results for the individual and society in terms of physical and cognitive aspects such as creativity, flexibility, strong problem-solving skills, high self reliance and participation in activities. In addition, a higher sense of SE helps pupils to focus on learning tasks, perform better, and ultimately achieve success in learning goals (Au & Bardakçı, 2020).

Some theorists suggest that a low level of SE leads to motivation difficulties. If students think that they will not be successful in certain tasks, they will try completing them superficially, quickly give up and avoid or resist them (Margolis & McCabe, 2006). While a student with high SE believes that he can make a great effort when faced with difficulties, the one with low SE doubts his ability and sees everything he encounters as difficult and impossible (Sundari & Dasmo, 2014). According to Au and Bardakçı (2020), without sufficient SE, students may not engage in more difficult tasks and may not exhibit their skills. As a result, low SE perception hinders academic success and adversely affects psychology by creating self-fulfilling prophecy and learned helplessness in the long run (Margolis & McCabe, 2006).

There are various factors that affect individuals' low or high SE perceptions. According to Miyauchi (2022), SE basically consists of performance-based experiences, indirect experiences, verbal persuasion, and emotional states. Performance experiences, which refers to the sense of achievement as a result of successful experiences (Pajares & Valiante, 2006), are the most influential source in the construction of SE, as results interpreted as accomplished increase SE and those interpreted as failure decrease it (Oettingen, 1999; Pajares, 2003). Indirect experiences show the comparison between individuals' own abilities with that of their role models (Usher & Pajares, 2008). Students form their SE beliefs via the experience of indirect observation while others perform tasks (Britner & Pajares, 2006). According to Oettingen (1999), role models provide a standard for questioning one's abilities so that individuals can predict their SE by observing the successes and failures of others. Verbal persuasion is words of encouragement or feedback from parents or others who are considered important to one's performance (Usher & Pajares, 2008). As a result of verbal messages and social persuasions received from others, individuals' SE beliefs develop. While positive persuasion can contribute to encouraging and strengthening, negative persuasions can weaken one's self-belief (Pajares, 2003). Emotional states also show arousal through physiological responses while engaged in a particular task. Positive emotions can increase one's SE or reduce high anxiety levels for successful future performance (Britner & Pajares, 2006).

SE perceptions, which determine how people feel and think (Jones & Riazi, 2011) and constitute an important aspect of human motivation, directly affect certain actions (Alawiyah, 2018). However, as Schunk (1995) states, SE alone is not sufficient for affecting behavior. High SE will have no effect on performance without necessary knowledge and skills. At the same time, because of firstly conceptualization as a situation-specific belief (Sherer et al., 1982), SE is task-specific and becomes different from context to context. In this regard, SE should be

measured specifically, not in general (Raoofi et al., 2012). One of the areas where SE can be measured specifically is speaking skill.

Conversational SE is the ability of an individual at work, school, family, on the phone, in a political meeting, etc. It is the belief of competence to effectively convey one's wishes, designs, feelings and thoughts in a situation (Hamzadayı, 2019). Speaking SE contains students' perceptions of their own skills to communicate in the target language (Shamiri & Farvardin, 2016) and is related to the psychological aspect of speaking. Speaking skill is analyzed under three dimensions, namely physical, cognitive/mental and affective. The factors such as emphasis and intonation, hand-arm movements, and eye contact are mostly related to the physical aspect, while the individual's ability to fully and properly express the message he wants to give to the other person is more related to the cognitive aspect. (Gölpınar et al., 2018). The affective dimension, on the other hand, is about how individuals feel during the action. The positive feeling in this sense enables the individual to find the power to use that action voluntarily and outside the learning environment (Topuzkanamış, 2022). In the affective dimension of speaking, there are affective reactions developed against speaking. The motivation and attitude of the individual to speaking, the level of anxiety before and during speaking, and the perception of SE for speaking skills forms the affective dimension of speech (Gölpınar et al., 2018). An effective speech is possible with the healthy functioning of mental and physical processes, as well as the emotional support of them. In this respect, students' perceptions of speaking skills, their willingness to speak, their motivation levels, and how they see themselves in speaking need to be emphasized and examined.

According to the literature on the perception of SE regarding speaking, studies abroad focus on foreign language speaking SE (Alawiyah, 2018; Darmawan et al., 2021; Sundari & Dasmo, 2014; Leeming, 2017; Liu, 2013; Quang et al., 2022; Rahayu & Jacobson, 2012; Shamiri & Farvardin, 2016). Studies in Turkey, on the other hand, are scale development studies to determine students' perceptions of speaking SE (Demir & Börekçi, 2022; Hasırcı Aksoy et al., 2021; Katrancı & Melanlıoğlu, 2013; Oğuz, 2016; Öztahtalı & Şahin, 2020; Sallabaş, 2013); pre-service teachers (Akin, 2016; Alan, 2021; Baki, 2018; Balbağ & Yenilmez, 2019; Çakır, 2015; Hayran, 2020; Katrancı, 2014; Oğuz, 2009; Oğuz, 2015; Özden, 2018; Özenç et al., 2021; Tekin et al., 2022; Tekşan & Çinpolat, 2018; Tunagür, 2021), undergraduate students (Demirel et al., 2020) and students who learn Turkish as a foreign language (Aydın et al., 2017; Kaplan Alptekin & Demir, 2022; Kurudayıoğlu & Güngör, 2017; Sallabaş, 2012) and secondary school students' speaking SE (Aydın & Kayman, 2021; Demir & Börekçi, 2021). Accordingly, research groups of these studies were mostly selected from pre-service teachers, and limited studies were conducted on students at the secondary school level. Literature review shows that studies in which secondary school students participated were limited to a single grade level. In this respect, it is believed that the research will contribute to the field in terms of being a study carried out with all classes at the secondary school level. Taking a stand from the problem statement of "Do the SE perceptions of secondary school students regarding speaking skills differ according to various variables?", the sub-problems of the research are determined as follows:

1. What is the level of secondary school students' SE perceptions regarding speaking skills?
2. Do secondary school students' SE perceptions regarding speaking skills differ according to gender?
3. Do secondary school students' SE perceptions regarding speaking skills differ according to grade level?
4. Do secondary school students' SE perceptions regarding speaking skills differ according to their success in Turkish lessons?
5. Do secondary school students' SE perceptions regarding speaking skills differ according to the number of siblings?
6. Do secondary school students' SE perceptions regarding speaking skills differ according to their mother's education level?
7. Do secondary school students' SE perceptions regarding speaking skills differ according to their father's education level?

2. Method

In this section, the research model, research group, data collection tool, data collection, and data analysis titles are given.

2.1. Research Model

This research, which aims to determine the SE perceptions of secondary school students regarding speaking skills in terms of various variables, was designed with a quantitative survey model. This model is defined as the quantitative or numerical description of trends, opinions, or attitudes in the universe with research carried out on a sample selected from a population (Creswell, 2014). The model is applied using questionnaires or interview protocols, a sample selected from the targeted population in line with the subjects of interest frequently. In addition to the changes that occur over time, the insight into a particular situation that took place at a specified time can also be explored (Christensen et al., 2020). The survey model is one of the leading methods used in the field of education due to its versatility, efficiency, and generalizability (McMillan & Schumacher, 2010).

2.2. Study Group

The study group of the research consisted of 434 students studying at Borsa Istanbul Secondary School located in the central district of Bartın province. Demographic information for the participants in the study group is presented in Table 1.

Table 1: Demographic information

Variables	Criteria	N	%
Gender	Girl	212	48.84%
	Male	222	51.16%
Grade level	5	100	23.04%
	6	114	26.27%
	7	91	20.97%
	8	129	29.72%
Turkish lesson grade	3 or less	90	20.74%
	4	141	32.49%
	5	203	46.77%
Number of siblings	0	30	6.91%
	1	163	37.56%
	2	174	40.09%
	3 or higher	67	15.44%
Educational level of mother	Primary school	114	26.27%
	Secondary school	128	29.49%
	High school	127	29.26%
	University	65	14.98%
Educational level of father	Primary school	57	13.13%
	Secondary school	119	27.42%
	High school	148	34.10%
	University	110	25.35%

As presented in Table 1, the research group (n=434) consisted of 212 (48.84%) female students and 222 (51.16%) male students. 100 (23.04%) of these students were 5th grade students; 114 (26.27%) were 6th, 91 (20.97%) were 7th, and 129 (29.72%) were 8th grade students. While 90 of the participants (20.74%) had a grade point average of 3 or below in Turkish lesson in the previous year, 141 (32.49%) had 4 and 203 (46.77%) had 5. In the study, 30 (6.91%) participants had no siblings, 163 (37.56%) had 1, 174 (40.09%) had 2, and 67 (15.44%) had 3 or more siblings. In terms of the educational level of mother, 114 (26.27%) were primary school graduates, 128 (29.49%) were secondary school graduates, 127 (29.26%) were high school graduates and 65 (14.98%) were university graduates. As for the education level of father, 57 (13.13%) were primary school graduates, 119 (27.42%) were secondary school graduates, 148 (34.10%) were high school graduates and 110 (25.35%) were university graduates.

2.3. Data Collection Tool

The data was collected by means of a research form consisting of "Personal Information Form" prepared by the researcher to determine the demographic characteristics of the participants, and the "Speaking Self-efficacy Scale" developed by Hasırcı Aksoy et al. (2021) for secondary school students, consisting of 4 sub-dimensions and 24 items, to measure their SE perceptions regarding speaking. Information on the development process of the scale is presented below.

After the analysis of the 48-item pool, which was prepared by using the studies in the literature and the opinions of the teachers, by 8 experts, corrections were made in 4 items, and 3 items were extracted from the item pool. In order to determine the intelligibility of the items, a total of 36 students from the 5th, 6th, 7th and 8th grades were asked to read the items and they were asked to express what they understood from each item. After this process, 4 items that the students did not understand or had different meanings were corrected. In the last case, a 5-point Likert-type draft form consisting of 42 positive and 3 negative items was created.

The 45-item draft form was applied to 205 secondary school students for confirmatory factor analysis, and the Cronbach Alpha value was calculated as .929 as a result of the internal consistency analysis for the reliability of the scale. In the analysis conducted on the outputs obtained for the item analysis, it was extracted 4 items from the scale. When the problematic items were removed, Cronbach's Alpha value for the internal consistency of the scale increased to .945. In the next stage, the scale was applied to 610 secondary school students for exploratory factor analysis (EFA) with 41 items. According to the .939 value obtained as a result of the Kaiser–Meyer–Olkin (KMO) test performed to decide the suitability of the sample size for factor analysis, it was seen that the data set showed a “perfect fit” for factor analysis. As a result of Barlett’s test of sphericity applied to determine whether the correlations between the items in the data set are sufficient [$\chi^2=4960.366$; $df=351$, $p=.00$], the data was found suitable for exploratory factor analysis (EFA). According to the results of principal components analysis applied to the scale, four factors and 27 items included in these factors were obtained. The factor load values were between .405 and .692 for the items in the first factor (affective), between .428 and .638 for the items in the second factor (content), between .406 and .692 for the items in the third factor (non-linguistic) and between .611 and .657 for the items in the fourth factor (being affected). When the correlation values of the four factors were examined, it was determined that the relationship between the factors of the measurement tool was significant and moderate. As a result of the analysis made to confirm the 4-factor 27-item structure of the scale, which was determined according to the EFA results, 3 items were removed from the scale. In order to determine the reliability values of the scale, the Cronbach Alpha internal consistency coefficient was examined, and the resulting .815 value showed that the items of the scale were consistent within themselves and the degree of reflecting the SE perception expressed was "acceptable and at a good level". At the last stage, in order to determine the distinctiveness of the scale items, the difference between the mean scores of the lower and upper groups was examined, and the independent groups t-test was applied for this. According to the results obtained, it was revealed that the speech SE perception scale developed for secondary school students has distinctiveness. When the obtained data were examined, a Likert-type measurement tool consisting of 24 items and 4 factors was obtained. The scale was scored as “Strongly Disagree” (1), “Disagree” (2), “Undecided” (3), “Agree” (4) and “Totally Agree” (5). Accordingly, the lowest score that can be obtained from the scale is 24, and the highest score is 120. Since the scale is a 5-point Likert type, average scores between 1-1.80 correspond to very low level of perception; 1.81-2.60 low; 2.61-3.40 moderate; 3.41-4.20 high and 4.21-5.00 very high perception.

2.4. Data Collection

After the researcher decided on the data collection tool to be used in the research, one of the authors who developed the scale was contacted and first of all, approvals were received for the use of the scale. Then, the Ethics Committee process of the study was initiated, and the research permission was received at the meeting of Bartın University Social and Human Sciences Ethics Committee with protocol number 2022-SBB-0185, dated 12.05.2022 and numbered 8. Following the start of the 2022-2023 academic year, the Bartın Provincial Directorate of National Education, to which the Bartın Borsa İstanbul Secondary School is affiliated, was applied with the necessary documents and the permission process was initiated. With the letter of the Directorate dated 26.09.2022 and numbered E-64441482-604.01.01-58925843, "approval" was obtained for the research. The research data were collected between 3-14 October 2022 during appropriate lesson hours by the researcher, and on the basis of student/parent voluntariness. The study was conducted in a total of 16 branches, 4 from each grade level. One of

the 435 scale forms collected from the participants was not included in the study because it did not provide the necessary data, and data analysis was started with 434 forms.

2.5. Analysis of Data

The data was analyzed using the SPSS 21.0 Package Program. Secondary school students' SE perception levels for speaking skills were revealed by using descriptive statistics such as arithmetic mean and standard deviation. Before examining the SE perceptions of the participants according to various variables, normality tests were applied. Skewness and Kurtosis values were calculated and found to range from -1.50 to +1.50. It was decided to use parametric tests since it was seen that the data was distributed normally. The differences in the SE perceptions of secondary school students regarding speaking by gender were determined by using independent groups t-test from parametric tests. The differences in terms of grade level, Turkish lesson success, number of siblings, father's educational level, and mother's educational level were analyzed using one-way analysis of variance, which is another parametric test. Post-Hoc analyzes were also used to determine between which groups the significant difference occurred in the variables analyzed via ANOVA. Percentage and frequency values were taken into account in the analysis of the data obtained with the Personal Information Form.

3. Findings

The findings of the study are presented in this part of the study based on the sub-problems.

3.1. Findings Regarding the First Sub-Problem

Findings related to the first sub-problem "What is the level of SE perceptions of secondary school students regarding speaking skill?" are presented in Table 2.

Table 2: SE perception levels of secondary school students regarding speaking

Dimensions	N	\bar{x}	S
Affective	434	3,54	,78
Content	434	3,60	,86
Extralinguistic	434	3,72	,84
Interaction	434	3,57	,95
Total	434	3,61	,73

As presented in Table 2, the average score of the SE perception of the secondary school students regarding speaking is 3.54 in the "affective" dimension; 3.60 in the "content" dimension; 3.72 in the "extralinguistic" dimension; 3.57 in the "interaction" dimension and 3.61 in the whole scale. According to the whole scale and all its sub-dimensions, the SE perceptions of the participants regarding speaking skills were found at a "high" level.

3.2. Findings Regarding the Second Sub-Problem

The findings related to the second sub-problem "Do secondary school students' SE perceptions regarding speaking skills differ in terms of gender?" are presented in Table 3.

Table 3: Gender variable independent groups t-test results

Dimension	Gender	N	\bar{x}	S	sd	t	p
Affective	Female	212	3,49	,76	432	-1,203	,230
	Male	222	3,58	,79			
Content	Female	212	3,64	,87	432	,836	,404
	Male	222	3,57	,85			
Extralinguistic	Female	212	3,78	,86	432	1,435	,152
	Male	222	3,67	,82			
Being affected	Female	212	3,64	,93	432	1,493	,136
	Male	222	3,50	,97			

Total	Female	212	3,62	,73			
	Male	222	3,59	,74	432	,513	,608

According to Table 3, when the SE perceptions of the participants by gender are examined, no significant difference was found in the affective dimension ($p=.230>.05$), content dimension ($p=.404>.05$), extralinguistic dimension ($p=.152>.05$), being affected dimension ($p=.136>.05$) and the whole scale ($p=.608>.05$) since p values were found greater than .05.

3.3. Findings Regarding the Third Sub-Problem

Findings regarding the third sub-problem "Do secondary school students' SE perceptions regarding speaking skills differ according to grade level?" are given in Table 4.

Table 4: One-way analysis of variance results regarding grade level variable

Dimensions	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	Difference
Affective	Inter-groups	4,818	3	1,606			1-2
	In-groups	260,351	430	,605	2,653	,048*	1-3
	Total	265,169	433				1-4
Content	Inter-groups	3,055	3	1,018			
	In-groups	321,407	430	,747	1,362	,254	
	Total	324,461	433				
Extralinguistic	Inter-groups	2,925	3	,975			
	In-groups	307,658	430	,715	1,363	,254	
	Total	310,584	433				
Being affected	Inter-groups	2,381	3	,794			
	In-groups	394,349	430	,917	,866	,459	
	Total	396,730	433				
Total	Inter-groups	2,625	3	,875			
	In-groups	233,645	430	,543	1,610	,186	
	Total	236,269	433				

* $p<.05$

According to Table 4, when the SE perceptions of the participants regarding speaking are examined in terms of the grade level, there is no significance in the content dimension ($p=.254>.05$), extralinguistic dimension ($p=.254>.05$), being affected dimension ($p=.459>.05$) and the whole scale ($p=.186>.05$) since p values were found greater than .05. On the other hand, there is a significance in the affective dimension of the scale ($p=.048<.05$) since the p-value was found less than .05. As a result of the LSD test, which is one of the Post-Hoc tests applied to determine between which groups there is the significance, it was found that the difference was between the 5th grades and the 6th, 7th, 8th grades and in favor of the 5th grades.

3.4. Findings regarding the fourth sub-problem

Findings related to the fourth sub-problem "Do secondary school students' SE perceptions regarding speaking skills differ according to their success in Turkish lessons?" are given in Table 5.

Table 5: One-way analysis of variance results regarding success in Turkish lesson variable

Dimensions	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	Difference
Affective	Inter-groups	16,799	2	8,400			1-3
	In-groups	248,370	431	,576	14,576	,000*	2-3
	Total	265,169	433				
	Inter-groups	23,130	2	11,565	16,541	,000*	1-2

Content	In-groups	301,332	431	,699			1-3
	Total	324,461	433				2-3
Extralinguistic	Inter-groups	16,621	2	8,311			1-3
	In-groups	293,963	431	,682	12,185	,000*	2-3
	Total	310,584	433				
Being affected	Inter-groups	16,852	2	8,426			1-3
	In-groups	379,878	431	,881	9,560	,000*	2-3
	Total	396,730	433				
Total	Inter-groups	18,267	2	9,133			1-3
	In-groups	218,003	431	,506	18,057	,000*	2-3
	Total	236,269	433				

*p< ,05

According to Table 5, when the SE perceptions of the participants regarding speaking according to their success in Turkish lessons are examined, there was found a significance in the affective dimension ($p=.000<.05$), content dimension ($p=.000<.05$), extralinguistic dimension ($p=.000<.05$), being affected dimension ($p=.000<.05$) and the whole scale ($p=.000<.05$) since the p values were found less than .05. As a result of the LSD test, which is one of the Post-Hoc tests applied to determine between which groups there is the difference, the significance was found between those with a grade point average of 3 or below and those with an average of 5 in favor of the latter; between those with a grade point average of 4 and those with an average of 5 in favor of the latter. In addition, in the content dimension of the scale, a significance was found between those with a grade point average of 3 or below and those with an average of 4 in favor of the latter.

3.5. Findings Regarding the Fifth Sub-Problem

Findings regarding the fifth sub-problem "Do secondary school students' SE perceptions regarding speaking skills differ according to the number of siblings?" are presented in Table 6.

Table 6: One-way analysis of variance results regarding number of siblings variable

Dimensions	Source of Variance	Sum of Squares	sd	Mean Squares	F	p
Affective	Inter-groups	1,235	3	,412		
	In-groups	263,935	430	,614	,671	,571
	Total	265,169	433			
Content	Inter-groups	,817	3	,272		
	In-groups	323,645	430	,753	,362	,781
	Total	324,461	433			
Extralinguistic	Inter-groups	,590	3	,197		
	In-groups	309,994	430	,721	,273	,845
	Total	310,584	433			
Being affected	Inter-groups	1,971	3	,657		
	In-groups	394,759	430	,918	,716	,543
	Total	396,730	433			
Total	Inter-groups	,674	3	,225		
	In-groups	235,595	430	,548	,410	,746
	Total	236,269	433			

According to Table 6, when the SE perceptions of the participants regarding speaking are investigated in terms of the number of siblings, no significance was found in the affective dimension ($p=.571>.05$), content dimension ($p=.781>.05$), extralinguistic dimension ($p=.845>.05$), being affected dimension ($p=.543>.05$) and the whole scale ($p=.746>.05$), since p values were found greater than .05.

3.6. Findings Regarding the Sixth Sub-Problem

Findings regarding the sixth sub-problem "Do secondary school students' SE perceptions for speaking skills differ according to their mother's education level?" are presented in Table 7.

Table 7: One-way analysis of variance results regarding mother's educational status variable

Dimensions	Source of Variance	Sum of Squares	sd	Mean Squares	F	p
Affective	Inter-groups	1,315	3	,412		
	In-groups	263,855	430	,614	,671	,444
	Total	265,169	433			
Content	Inter-groups	2,801	3	,272		
	In-groups	321,660	430	,753	,362	,164
	Total	324,461	433			
Extralinguistic	Inter-groups	4,925	3	,197		
	In-groups	305,658	430	,721	,273	,076
	Total	310,584	433			
Being affected	Inter-groups	1,971	3	,657		
	In-groups	394,759	430	,918	,716	,060
	Total	396,730	433			
Total	Inter-groups	,674	3	,225		
	In-groups	235,595	430	,548	,410	,065
	Total	236,269	433			

According to Table 7, when the SE perceptions of the participants regarding speaking are examined according to their mother's education level, no significant difference was found ($p=.444>.05$), in the content dimension ($p=.164>.05$), extralinguistic dimension ($p=.076>.05$), being affected dimension ($p=.060>.05$) and the whole scale ($p=.065>.05$), since p values were greater than .05.

3.7. Findings Regarding the Seventh Sub-Problem

Findings related to the seventh sub-problem "Do secondary school students' SE perceptions for speaking skills differ according to their father's education level?" are presented in Table 8.

Table 8: One-way analysis of variance results regarding father's educational status variable

Dimensions	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	Difference
Affective	Inter-groups	4,867	3	1,622			1-3
	In-groups	260,302	430	,605	2,680	,047*	1-4
	Total	265,169	433				2-3
Content	Inter-groups	8,579	3	2,860			2-3
	In-groups	315,883	430	,735	3,893	,009*	2-4
	Total	324,461	433				
Extralinguistic	Inter-groups	7,646	3	2,549			2-3
	In-groups	302,938	430	,705	3,618	,022*	2-4
	Total	310,584	433				
Being affected	Inter-groups	9,410	3	3,137			1-3
	In-groups	387,320	430	,901	3,482	,025*	2-3
	Total	396,730	433				
Total	Inter-groups	6,667	3	2,222			1-3
	In-groups	229,603	430	,534	4,162	,006*	1-4
	Total	236,269	433				2-3
							2-4

* $p<.05$

According to Table 8, when the SE perceptions of the participants regarding speaking according to their father's education level are examined, a significant difference was found in the affective dimension ($p=.047<.05$), content dimension ($p=.009<.05$), meta-linguistic dimension ($p=.022<.05$), being affected dimension ($p=.025<.05$), and the whole scale ($p=.006<.05$), since the p values were found less than .05. As a result of the LSD test, which is one of the Post-Hoc tests conducted to determine between which groups there is the difference, there was the significance between those whose fathers are primary school graduates and high school/university graduates, in favor of the latter in the "affective" dimension; between those whose fathers are secondary school graduates and high school/university graduates in the latter in the "content" and "extralinguistic" dimensions; between those whose fathers are primary school graduates and high school graduates in favor of the latter in the "being affected" dimension; between those whose fathers are secondary school graduates and high school graduates in favor of the latter in the whole scale.

4. Conclusion, Discussion and Recommendations

Speaking is a fundamental skill for communication. The correct and effective use of this skill depends on the healthy functioning of physical, cognitive, and affective processes. One of the factors that makes a person successful in the act of speaking is the perception of competence one has about himself as a speaker. In this study, the SE perceptions of secondary school students regarding speaking skills were investigated based on some variables, and the results were summarized and interpreted in this section.

This study revealed that SE perceptions of secondary school students regarding speaking skills were high. In the research done by Akin (2016) and Özden (2018) with Turkish teacher candidates, it was reported that the participants' level of SE perception regarding speaking was high. Alan (2021) reached a similar conclusion in his study with pre-service teachers. Katrancı (2014), who examined the SE perceptions of teachers candidates regarding speaking, found that the participants had a high level of SE perception. Kaplan Alptekin and Demir (2022) who investigated the SE perceptions of Syrian children under temporary protection in Turkey regarding speaking, revealed that the participants had a moderate SE perception. In another study (Aydın et al., 2017) conducted on Turkish learners, it was found that the SE perceptions of the participants regarding speaking were found moderate. It is believed that these results show the difference in SE perception levels of those who speak Turkish as a first language and those who speak Turkish as a foreign language. It is pleasing that secondary school students have positive feelings and thoughts about their speaking skills and consider themselves sufficient in this regard. The skill of students to express themselves is very crucial for students to be successful in other courses, especially in Turkish. Therefore, it is predicted that SE perception level regarding speaking will have an effect on academic success.

The variable of gender has no significance in terms of secondary school students' SE perceptions regarding speaking. This result is parallel with other research conducted on the SE perceptions of pre-service Turkish teachers (Akin, 2016; Baki, 2018; Özden, 2018), pre-service teachers (Alan, 2021; Balbağ & Yenilmez, 2019; Oğuz, 2015; Tekin et al., 2022); university students (Demirel et al., 2020) and those who learn Turkish as a foreign language (Aydın et al., 2017; Kaplan Alptekin & Demir, 2022; Kurudayıoğlu & Güngör, 2017; Sallabaş, 2012). Also, there are some studies that report a significance between SE perceptions of teachers candidates (Çakır, 2015; Gerez Taşgın, 2015; Hayran, 2020; Katrancı, 2014; Ocak & Erşen, 2015; Tekşan & Çinpolat, 2018; Tunagür, 2021; Türkmen Uslu, 2020) and 8th grade students regarding speaking/communication in favor of female students (Demir & Börekçi, 2021). It is believed that the characteristics of the participants in the research groups may have an effect on such different findings.

It was observed that the class level does not cause any significance in three and all of the four sub-dimensions of the scale in the SE perceptions of the participants regarding speaking. In the affective sub-dimension of the scale, there is a significance between the 5th grades and the other grades in favor of the former. In some other studies (Akin, 2016; Alan, 2021; Balbağ & Yenilmez, 2019; Gerez Taşgın, 2015; Katrancı, 2014; Oğuz, 2015; Tekin et al., 2022), the SE perceptions of teacher candidates regarding speaking increase as the grade level increases. It is estimated that the fact that pre-service teachers get more prepared for the profession as the grade level rises may have an effect on these results. Considering that the secondary school level does not prepare students for a

profession based on speaking/oral skills such as teaching and is one of the first steps of education life, this finding in the research is an expected result. Actually, in other studies examining the speaking anxiety of secondary school students (Arslan, 2018; Kavruk & Deniz, 2015), the results that the grade level variable does not affect decisively on anxiety also support this judgment. The findings of the studies (Kaplan Alptekin & Demir, 2022; Kurudayıoğlu & Güngör, 2017) can also be evaluated from the perspective that there is no significance in the SE perceptions of Turkish learners as a foreign language regarding speaking in terms of the age variable, taking into account the similarity of age level with class level. It can be said that the fact that the 5th graders have a higher SE perception in the affective dimension compared to the other grades may result from the fact that they have just passed from primary school to secondary school. Since students in primary school usually spend a long time with a single teacher and can express themselves more easily in lessons, they may have considered themselves sufficient in this dimension of speaking at the beginning of secondary school.

One of the variables that made a significance in the students' SE perceptions regarding speaking was the success in the Turkish lesson. It was revealed that there was a parallelism between the lesson points of the participants and their SE perceptions regarding speaking, and it was determined that the participants who were more successful in Turkish lessons had higher SE perceptions. This result shows similarity to the findings of the study (Demir & Börekçi, 2021), which determined that success in Turkish lesson is a determinant in the SE perceptions of 8th grade secondary school students regarding speaking. Studies conducted by Tunagür (2021) on Turkish teacher candidates; Balbağ and Yenilmez (2019) on the effect of GPA on the speaking SE perceptions of science and mathematics teacher candidates concluded that as the grade point averages increase, the level of speaking SE perception increases. One of the most vital conditions for being successful in the lessons is to actively participate in the lesson. It can be said that the students who actively participate in the lesson, ask and answer questions will be more successful in the exams. The student, who sees that the success of the lesson increases as he speaks, will be more confident in speaking and his SE will increase. There are studies showing that this situation is related to both speaking SE and other language skills. In the study of Demircan and Aydın (2019), which examined the SE perceptions of secondary school students regarding listening, it was reported that success in Turkish lesson created a significance in SE in favor of students who have a high-grade point. Gerez Taşgın's (2015) study in which pre-service Turkish teachers' listening SE was examined also revealed that GPA is a determinant of perceptions. In other studies examining 8th grade students' SE perceptions regarding writing (Demir, 2011) and reading (İnnalı & Aydın, 2014), it was reported that success in Turkish lesson is a determinant on the level of SE perception. Considering that other language skills as essential as speaking in academic achievement, that the findings support each other can be suggested. According to Jackson (2002), students' SE beliefs directly affect their exam scores and success in lessons.

This study reveals that there is no significance in their SE perceptions towards speaking in terms of the number of siblings of the secondary school students taking part in the research. In the study conducted by Demir and Börekçi (2021) on 8th grade secondary school students, it was revealed that in terms of the number of siblings there is no statistically significance on SE perception levels regarding verbal expression. In the research of Dzhaznuzakov et al. (2020) conducted on university students; of Günönü Kurt (2019) on pre-service classroom teachers; of Uygun and Arkan (2019) on social studies teacher candidates, there is no statistically significance in terms of communication skills average scores according to the number of siblings. This variable was also found to be effective in various studies on concepts such as academic SE (Satıcı, 2013), emotional SE (Akkuş Çutuk, 2019), general SE (Demircioğlu & Işık, 2020). However, there are also studies (Akalin & Adıgüzel, 2020) showing that the number of siblings is effective on anxiety, another psychological dimension of speaking. Although the high number of siblings means the intensity of the communication environment, it does not influence the SE perception of verbal expression. This is interpreted as an inadequacy in giving children a voice, showing interest, and positive interaction in the family environment (Demir & Börekçi, 2021).

The mothers' educational status of the participants was not determinative of their speaking SE perceptions. In the study of Tekin et al. (2022), which examined the SE perceptions of English teacher candidates regarding speaking, it was revealed that there was no significance in terms of the level of mother's education in the speaking SE of the participants. A similar finding was also detected in studies examining the communication skills of students, such as Türkmen Uslu's (2020) on pre-service special education teachers; Dzhaznuzakov et al.'s (2020) on university students; Elkin et al.'s (2016) on health sciences students. In these studies, it was emphasized that the mother's

education level of the participants did not cause a significant difference in their communication skills. On the other hand, in the studies of Demir and Börekçi (2021) on 8th grade students, Akın (2016) on pre-service Turkish teachers, and Balbağ and Yenilmez (2019) on science and mathematics teacher candidates, the perception of SE regarding speaking was found to increase as the mother's education level increases. It can be understood that SE studies on other language skills also yield different findings. Studies conducted by Azizoğlu (2022) on secondary school students' SE perceptions regarding critical listening, Maden (2020) on pre-service teachers' SE perceptions regarding listening, and Ocak and Karakuş (2019) on pre-service teachers' SE perceptions regarding digital literacy concluded that mother's education level does not cause any significance in the SE perception. According to Gülli's (2020) study, in which writing SE of 4th grade students, there was a significance between the students whose mothers were high school graduates and the students whose mothers were primary school graduates. In addition, there are also studies in the literature showing that mother's education level is not a determinant of the attitudes (İşcan et al., 2017) and anxiety (Kavruk & Deniz, 2015) dimensions of speaking.

Father's education level stands out as another variable that caused a significance in the SE perceptions of secondary school students regarding speaking. Accordingly, the students whose fathers are high school and university graduates have a higher level of SE perception than the students who are primary and secondary school graduates. In the study of Demir and Börekçi (2021), it was determined that the speaking SE perceptions of 8th grade students whose fathers are high school graduates differ significantly from those whose fathers are primary school graduates. The findings of studies that examined SE perceptions of Turkish teacher candidates (Akın, 2016) and science and mathematics teacher candidates (Balbağ & Yenilmez, 2019) regarding speaking are also parallel to these results. In Kayadibi's (2016) study, it was found that the speaking skills of the 7th grade students whose fathers are secondary school graduates and above were higher than others in Macedonia. It was found that the variable of father's education level caused a significant difference in other studies examining speaking anxiety (Arslan, 2018), listening (Maden, 2020), and reading SE perceptions (İnnalı & Aydın, 2014). In this study, it is estimated that the desire of fathers with a higher education level to spend more time with their children, especially in academic terms, may be effective in the fact that the mother's education level variable is not the determining factor in the students' SE perceptions, instead the father's educational status variable is the determinant.

Based on the results of the present study, suggestions for further studies can be listed as follows:

Activities that will increase the speaking SE perceptions of students with low Turkish grade point averages can be carried out.

Interviews can be conducted with students on the reasons why the father's educational status variable is a determinant of the SE perception regarding speaking.

Research can be conducted to address the relationships between the other affective dimensions of speaking skills, such as attitude and anxiety, and SE perception.

Due to the limited number of research on the SE perceptions of secondary school students regarding speaking, more emphasis can be placed on the studies to be carried out with students at this education level.

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Students' Nature of Science Understandings: A Phenomenological Study

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Abstract

The efforts shown in recent years related to the reform movements in science education have focused on the assertion that informed nature of science understandings (NOS, hereafter) should be developed. In line with this idea, NOS has become the central component of numerous science curricula. In the study, therefore, it was aimed to determine science education master students' NOS understandings. The study was conducted in a state university in Turkey during the fall semester of the 2019-2020 academic year and included six science education master students who had taken science methods course. The data were collected through interviews and analyzed by content analysis under phenomenological method. As a result, the students had various and mixed understandings related to the definition of science and characteristics of scientific knowledge. In addition, it was observed that the students handled science with a narrow scope, that they had difficulty in the distinction between theory and law, and that they could not develop informed understandings in the component of theory-laden NOS. In light of these results, the implications and the directions for further study were provided.

Keywords: Graduate Students, Nature of Science, Phenomenology, Science Education

1. Introduction

The main purpose of science education is to raise scientifically literate individuals who actively participate in the construction process of scientific knowledge. One of the most important components of scientific literacy is NOS. There are many definitions of NOS. What is meant by understanding NOS is making sense of what science is and how it functions, what the relationship between science and society is, and the epistemological and ontological foundations underlying scientific activities that form these relations (Clough, 2006). In other words, NOS refers to "the epistemology of science, science as a way of knowing, or the values and beliefs inherent to the development of scientific knowledge" (Abd-El-Khalick et al. 1998, p. 418). Instead of putting forward a definition of NOS that will be accepted by everyone, it would be more rational to mention a few components that stand out. Considering that NOS can be taught at K-12 level, it has become important to identify the components of NOS teaching. While empirical, tentative, inferential, creative, and theory-laden are the essential components (Lederman, 1999), scientific method and theory-law are additional components (Abd-El-Khalick & Akerson, 2004; Lederman, 2007).

Empirical NOS is based on the assumption that science depends on observations related to the natural world. These observations are made through phenomena. However, we cannot directly have access to these phenomena. Evidence is collected through the methods of accessing the phenomenon such as experiment and measurement. It is possible that new evidence or re-interpreted evidence can support or falsify current theories. When compared with other methods, it is assumed that scientific method produces the most valid evidence. These characteristics of science separate it from other disciplines such as religion and philosophy. It is the component that has the most important role in the debate over what the boundaries of this distinction will be (Lederman et al. 2002). Tentative NOS, on the other hand, means that scientific knowledge can change through new evidence or re-interpreting current evidence. Scientific knowledge types, as well as scientific laws, are open to change. Tentativeness of scientific knowledge is directly related with empirical NOS, because this characteristic of scientific knowledge depends on the presence or re-interpretation of evidence (Lederman, 1999).

Inferential NOS involves judgements that are made over descriptive expressions related to directly observable phenomena. Creative NOS is based on the assumption that science is not an activity that is totally based on reason and sequential. Theory-laden NOS argues that scientific knowledge cannot be thought separately from scientists. Scientific knowledge is affected by bias, experiences, the values of their society, and expectations of scientists. Therefore, science never starts with objective observations (Abd-El-Khalick et al. 1998).

In order for teachers to effectively teach NOS through these components, they should firstly be aware of their NOS understandings (Capps et al. 2012; Southerland et al. 2006). It is important that teachers have informed NOS understandings, because these understandings support students in their making decisions based on scientific knowledge in their decision-making processes (Cullinane & Erduran, 2022; Khishfe, 2012). However, science teachers may not hold clear ideas about NOS (Morrison et al. 2009). Previous research has shown that both students and teachers have inadequate NOS understandings. It is noteworthy that these studies were conducted basically with teacher candidates (Abd-El-Khalick, 2005; Akerson et al. 2006; Cullinane & Erduran, 2022; Duruk & Akgun, 2020; Duruk et al. 2019; Karisan & Cebesoy, 2018; Mesci & Schwartz, 2017) and with students (Kampourakis, 2016; Khishfe & Abd-El-Khalick, 2002; Park et al. 2014; Voss et al. 2022). To the best of our knowledge, studies that examined NOS understandings of science education master students' who are likely to be the scientists of the near future are very few. Therefore, it was aimed in the present study to determine NOS understandings of these students. In line with this purpose, we framed the following research questions:

1. What are the understandings of the students related to science?
2. What are the understandings of the students related to the characteristics of science?

2. Method

2.1 Research Design

Phenomenology was the method of the study. Phenomenology is a qualitative research pattern that helps us to deeply understand the experiences of people who are involved in the event and experienced the facts one-to-one (Yin, 2016). Phenomenological science studies may not reveal definite and generalizable results that are appropriate for the nature of qualitative research. However, it can yield examples, explanations, and experiences that will provide results which will help us better understand a phenomenon. With this aspect, it significantly contributes to both scientific field and literature (Yıldırım & Simsek, 2016).

2.2 Study Group

The study included six science education master students who had taken science methods course. The study group was determined through convenience sampling, which is one of the purposeful sampling methods. All students were female.

2.3 Data Collection

Interview is a frequently used data collection method in qualitative studies. Creswell (2019, p. 127) has defined one-on-one interviews as “interviews that are used when personal perspectives of participants are needed.” In such interviews, changes in the interviewees’ body language and tones can be seen easily and a personal connection can be established. In one-on-one interviews, it is recommended to list the questions and prepare an interview log to record some parts of the author’s opinions in the interview process (Creswell, 2019, p.127-132). The interview log prepared for the study consisted of introduction, beginning, and content questions.

While preparing the interview form, firstly, the literature was reviewed and similar studies were examined. Then, by benefiting from interview questions used in similar studies, questions were prepared by the second author. The interview form included questions related to science and NOS. The interview form prepared in order to identify students’ NOS understandings consisted of two parts. In the first part, there were questions on personal information while the second part included questions on NOS understandings. Each student was given separate codes from P1 to P6 and they were identified with these codes throughout the study.

2.4 Data Analysis

Content analysis was performed during the analysis of the data. Content analysis is based on “bringing similar data together within the framework of certain concepts and themes and interpreting them to make them understandable by the reader” (Yıldırım & Simsek, 2016). In order to ensure integrity, the recordings made through the interviews were translated verbatim. Transcribed data were read, and meaningful data units were determined. By creating codes from the determined data units, a list of codes was prepared. Each interview question was handled as a theme, and the codes were associated with these themes. The second author analyzed the data. The first and the third authors conducted a blind round of analysis.

3. Results

3.1 Results regarding the first question

The codes obtained from the responses of students to the question of “How would you define the concept of science if you had to?” are given in Table 1.

Table 1: Definition of science

Codes	Participants						
	P1	P2	P3	P4	P5	P6	f
Science branches				+			1
Changeable-open to development		+	+	+		+	4
Effort to understand nature-universe	+	+	+	+	+		5
Searching accuracy-fallacy						+	1
Intellectual activities	+						1
Universal				+			1
Based on observation-experience				+			1
Everything related to life	+			+			2
Need-problem		+				+	2
Communication	+						1
Research-investigation process		+	+		+	+	4
Human-made				+			1
Discovery			+				1

Curiosity		+		+	2
Objective			+		1
Problem-solving	+				1
Subjective			+		1
Continuous-perpetual-dynamic	+			+	2
Not possible to exactly define				+	1
Technology	+		+		2

When Table 1 is examined, it is seen that out of the six students, five defined sciences as an effort to understand nature-universe, four as research-investigation process, two as need-problem, one as searching accuracy-fallacy, and one as intellectual activities. Some excerpts are as follows:

....Science examines not only humans, I mean, it is humans' effort to understand the universe, nature, so it starts investigating from the near environment and proceeds to far environments. I mean it examines all living and non-living things, from animals to microorganisms and fungi. ... (P5).

....Development comes to my mind., or discovering things uncovered in the nature, revealing undiscovered things in the nature. Or, finding out about unknown things, investigating and examining them. ... (P3).

...We can call it a branch that examines behaviors in line with the needs of humanity. We can name studies done on any matter that exists in line with the needs as science. ... (P2).

Out of the six respondents, four used expressions such as changeable-open to development, two referred to science as continuous-perpetual-dynamic, and one defined it as objective, and they tried to associate science with scientific knowledge. Related excerpt is as follows:

...Well, in order to call it science, we can say that it must be universal rather than well-accepted. We can say that it should appeal to everyone. Most people are the same, both science and scientific knowledge are universal. .. science is objective. Because it involves events that we can observe, experience, and reach the same conclusion. As I said, boiling of water, the impact of pressure, change in open air pressure, gas pressure in closed cups; all these are universal subjects for the whole world. But, in our childhood, we only knew concepts related to atom such as proton, electron, neutron, with the advancement of science, the concept of quark has emerged. Maybe through years science will also be changeable. ... (P4).

Considering other codes related to the definition of science, it is seen that the participants associated science with concepts such as discovery, curiosity, technology, and communication.

3.2 Results regarding the second research question

The codes obtained from the responses of students to the question of "What are the characteristics of scientific knowledge?" are given in Table 2.

Table 2: Characteristics of scientific knowledge

Codes	Participants						f
	P1	P2	P3	P4	P5	P6	
Based on mind-reason		+					1
Comprehensible				+			1
Product of investigation-questioning			+				1
Scientific research steps					+	+	2

Advances through accumulation	+	+						2
Open to change-development	+	+	+	+	+	+	+	6
Experiment-observation	+							1
Verifiable-falsifiable	+		+	+			+	4
Open to criticism		+						1
Universal	+					+	+	3
Well-accepted						+	+	2
Updated		+						1
Imagination							+	1
Within life						+		1
Provable	+		+	+	+			4
Not certain						+		1
Affected by culture							+	1
Objective		+						1
Subjective			+					1
Systematic						+		1

According to Table 2, all students used the expression “open to change-development”, four students stated it was verifiable-falsifiable, and four students said it was provable. Sample excerpts are as follows:

...We usually obtain scientific knowledge through experiments and observation in terms of physical sciences. We learned in our undergraduate courses that this knowledge is repeatable and verifiable through experiments. And we also know that this knowledge can change over time. From the perspective of physical sciences, yes, it can be proven, but some additions can also be made to it. I mean, I can say that this is a multiplying situation along with the development of technology and advancement of research. It can be provable. In the proving phase, when the steps followed are repeated, the same results can be obtained. (P1).

... It must be testable. It must mean the same thing to everyone. I mean, scientific knowledge is not A for me B for you. If there is a piece of scientific knowledge, it must be based on proven evidence. In addition, it is always falsifiable. That is, it has an ever-changing feature. It is also developable. (P4).

Table 3: Scientific method

	Participants						
Codes	P1	P2	P3	P4	P5	P6	f
Research-based			+				1
A gradual process		+					1
Steps that emerge as a result of certain accumulation				+			1
Making knowledge valid-reliable					+		1
Facilitating access to knowledge	+						1
Reinforcing knowledge					+		1
Scientific research steps (problem statement, hypothesis, data collection...)	+	+		+	+		4
Method used to access scientific knowledge	+			+	+		3

Path proving scientific findings	+		+	+	+	+	5
Constant method		+					1
Not well-accepted				+	+		2
Well-accepted	+	+					2
Quantitative-qualitative method				+			1
Scientific research process				+			1
Systematic		+					1

Considering Table 3, it is seen that five out of six students used the feature of being a path proving scientific findings for scientific method, and four mentioned the scientific research steps starting with problem statement and continuing as hypothesis and data collection. In addition, three students used the expression “method to access scientific knowledge”, emphasizing its process feature. Relevant excerpt is as follows:

...In accessing scientific knowledge, we mention that there are certain steps that we should follow. We also say that we should firstly start with a problem statement in order to reach scientific knowledge. Upon forming the problem statement, we establish a hypothesis based on the problem statement. Then we test the hypothesis with experiments and observations. We check whether the hypothesis is supported. Accordingly, we can go back to the hypothesis establishment step, or if it is supported, we move on to supporting it with experiments. We explain it to our students in this way. What I am getting at is that yes, there are certain steps. We reach scientific knowledge by following these steps. (P1).

The excerpt mentioning scientific method do not comply with contemporary NOS understandings. By talking about certain steps, the student expressed that one general method is well-accepted in scientific research process. Moreover, the students listed the advantages brought by scientific method as facilitating access to knowledge, providing validity-reliability, and reinforcing knowledge. The relevant sample excerpt is as follows:

...While providing scientific knowledge, we must give feedback about why these are true. For example, I tell my students that there may be one and a half million species of fungi, but that only 70-75 thousand of these have been identified. Then, they ask how you can predict this number and how are living things categorized. You know, there must be certain criteria for these to be valid. A certain method should be followed. Because they always ask me while I am categorizing living things why human beings are categorized within animals. I need to come up with certain scientific foundations while transferring this knowledge to my students... (P5).

Table 4: The impact of society on science

Codes	Participants						
	P1	P2	P3	P4	P5	P6	f
Supporting-not supporting viewpoint	+	+			+	+	4
Objective perspective of science				+			1
Being closed to change-development	+		+	+		+	4
Religious thinking	+		+	+		+	4
Thought structure						+	1
Education-knowledge level					+		1
Ethical rules				+			1
Interests and needs		+			+		2
Beliefs						+	1
Culture						+	1

Political decisions				+		1
Socioeconomic level					+	1
Technological literacy level	+	+		+		3
Societal perception				+		1
Investment-economic opportunities	+	+				2

As can be seen in Table 4, the students expressed that society affected science as in contemporary NOS understandings. When asked about how society affects science, four students stated that whether societal viewpoint supports science or not affects science, and that the society being open or closed to scientific studies and religious thoughts of the society affect scientific studies conducted. In a general sense, they expressed that social mentality guides science, and that it has a significant effect on the development of science. The relevant excerpts are as follows:

...There, a scientist was mentioned. I remember his name as Takuyiddin Tusi. He made observations on astronomy. And I also remember that his observations were not welcome by the society, and therefore, his observatory was set on fire. I mean, preventing someone who did studies well beyond his time in terms of astronomy from making observations only because of the society's perspective looked awkward to me then. Even today, society's viewpoint is important... (P1).

... Or society's viewpoint is important of course; their support for scientific studies can change the course of perspectives and scientific research. Of course, the more it is supported by the society, the more it can advance. If it is not supported or there is lack of interest in it, research loses pace, and we cannot make quick progress... (P2).

...Looking back at history, people were afraid to deal with science in times when Christianity had very strict rules, for example. They were dealing with science in secret. They pretended to be committed to their religion, but at the same time, they saw the wrong side of the matter. In such conditions, due to the viewpoint of the society, it was necessary to do scientific studies in secret. So, some perspectives of the society can influence science. This prevents science from advancing. In those times, society did not approve of the studies of scientists with the belief that they might become heretic in a religious sense. But now, science has taken a step forward... (P3).

When Table 4 is examined, it is seen that the students expressed that technological literacy level and education-knowledge level affected science, and that science advanced more rapidly in countries developed in terms of education and technology. In addition, it was stated by the students that investment made in science, economic opportunities, and socioeconomic status also affected science. The relevant excerpts are as follows:

...For example, there is brain drain out of our country now; if a country or government supports science and makes adequate investments in this regard, science develops there; otherwise, brains migrate out of the country to continue their studies abroad. This is what I think on this issue... (P1).

...What makes up viewpoint is culture, belief, and socioeconomic status. For example, it is easier to raise scientists in a society with high level of welfare compared to a structure, culture, or a society where agriculture and human labor are dominant....(P6)

Table 5: The impact of science on society

Codes	Participants						
	P1	P2	P3	P4	P5	P6	f
Variety of sources of knowledge					+		1
Easier to access knowledge	+						1

Questioning knowledge				+	+	2
Affecting foreign policy				+		1
Being or not being foreign-dependent				+		1
Change in thought structure-open to development			+			1
Improvement in education			+			1
Economic development	+	+				2
Destroying older thoughts					+	1
Meeting needs					+	2
Enabling proving					+	1
Mutual interaction		+				1
Generation gap	+					1
Viewpoint					+	2
Improvement in health	+	+		+	+	4
Solving problems		+				1
Technological developments	+					1
Advancement-development of society		+	+	+	+	4
Change in attitudes and behaviors					+	1
Easier transportation-communication	+					1

In Table 5, four students emphasized that science enabled society to advance and develop, while 4 students focused on the improvements in health. It was also stated that with the development of science, society's point of view changed, older views were destroyed, and generation gap was created. Sample excerpts are as follows:

... They are interconnected. Science affects society, and society affects science. Scientific changes, developments, and scientific studies will definitely contribute to the development and advancement of society and solutions to its problems. (P2)

...It affects society both in terms of health and economy.... (P2)

... Of course it affects. A whole generation has been differentiated with the effect of science, and we call them as Generation Z. With the advancement of science, technology has developed, and now there are smart phones and Internet connection in every house. It separated one generation from another... (P1).

...It can change and improve a society in terms of its thoughts. It removes the patterns of thought that the society is accustomed to and makes people open to development, more knowledgeable, and more motivated (P3).

In addition, the participants also stated that science provided variety of sources of knowledge and facilitated access to knowledge, but that as there is an information pollution, knowledge should be questioned at the same time. The sample statements in this regard are as follows:

...And there is also this thing, people are trying to receive information from the most accurate source of knowledge due to the pandemic. Because there is too much false information in circulation. How can I get the most correct information....(P5)

...You look at sources of knowledge, they are in the process of shaping. I can summarize it in this way. Science is effective on society in terms of viewpoints, and due to the need for discriminating scientific knowledge, society feels the need to question knowledge. (P5)

It was also expressed that science affected international competition, as can be understood from the codes of being or not being foreign-dependent, affecting foreign policy, and economic development. The relevant excerpts are as follows:

...For example because we do not produce smart phones, we are foreign-dependent and import them. We are affected by foreign exchange rates We are affected by policies. Since we do not produce, we live in a foreign-dependent way... (P4)

New discoveries in science have enabled society to improve. The more advanced a society is, the more economically free it is...(P3)

Table 6: Experiment-observation in science

Codes	Participants						
	P1	P2	P3	P4	P5	P6	f
Accuracy-fallacy of knowledge is tested	+		+	+		+	4
Contributes to science					+		1
Enables access to scientific data	+						1
Can be used together		+					1
Experiment aims at proving		+					1
Experiment yields a generalizable result		+					1
Experiment reveals phenomena				+			1
Science is not possible without experiment and observation			+	+			2
Provides permanent learning					+		1
Provides validity-reliability	+						1
Provides universality	+						1
Observation in in-depth analysis		+		+			2
Observation in qualitative studies, experiment in quantitative studies		+		+			2
No experiment without observation, but observation with experiment		+	+				2
Provides proof-justifiability	+	+	+		+	+	5
Repeatability		+	+			+	3
Essential but not inevitable						+	1

In Table 6, it is seen that the students generally expressed that experiment and observation provided provability for scientific knowledge, that they were used in testing accuracy and fallacy of knowledge, and that they ensured repeatability. Sample excerpts in this regard are as follows:

... Scientific studies must be proven and the result must be repeatable. Hence, the role of experiment and observation is very important... (P2)

... Sir, what we call science is actually based on experiment and observation. Because they can verify or falsify what individuals can see and test... (P4)

It is seen in the table that the students emphasized the importance of experiment and observation with statements such as “contributing to science, enabling access to scientific knowledge, ensuring permanent learning, and providing validity and reliability and universality.”

...Looking from here, we see that most of the data obtained through scientific methods are obtained through experiment and observation. Therefore, I think experiment and observation are important. In fact, they test the accuracy of our knowledge. I mean, if I get a result, and another person gets another result, I cannot prove its accuracy. Then, I get stuck in the hypothesis step. But, if I want to ensure universality and reliability of knowledge, I must definitely prove the accuracy of the results... (P1)

In addition, it is seen that the students evaluated experiment and observation comparatively by stating codes such as “experiment aims at proving, experiment is preferred in order to put forth a generalizable result, experiment reveals phenomena, observation is used in in-depth analysis, observation is used in qualitative studies, experiment is used in quantitative studies, experiment without observation is not possible, but observation without experiment is possible.” The relevant excerpt is as follows:

...In what kinds of studies do we use observation? Mostly in qualitative research, we make observations and by reaching a result, we try to solve a problem or put forward something new. Mostly, when we want to do in-depth studies, we use observation method a lot. Then, when do we use experiment? In experiments, when we want to prove something and to reveal a definitive result or a generalizable result, we experiment and by reaching the same result at every trial, we produce an outcome. In other words, what we call observation is at the beginning of an experiment. But, something can be observed first, and then it can be researched. I mean, even when you are going to do something experimental, you still need observation in order to create a problem statement. But, when we want to do more in-depth studies, or when we want to reveal a situation, say, on a subject, or do some research on that subject, we use observation more. (P2).

Table 7: Imagination and creativity in science

Codes	Participants						
	P1	P2	P3	P4	P5	P6	f
Trigger research			+				1
A feature that a scientist must have		+			+		2
Science is born from imagination				+			1
Starting point in science			+	+		+	3
Advancement of science	+				+		2
Supportive in producing solutions-creating a product	+			+		+	3
Experiment is imagined before observation			+				1
Different perspective				+			1

Are in human nature	+			1
Effective in ensuring permanent learning		+		1
Necessary for introducing the problem	+			1
Are based on curiosity		+	+	2
Productivity-synthesis		+	+	2

All students expressed that scientists used imagination and creativity in scientific process, and they provided responses that overlap with contemporary NOS understandings. The codes extracted from the responses are given in Table 7. As can be understood from the codes, some students stated that imagination and creativity are necessary for introducing the problem, that science was born from creativity, and that they triggered research, emphasizing that imagination and creativity were used at the start of scientific process. The sample excerpts in this regard are as follows:

.... Consequently, most scientists imagine things before they experiment and observe. Because imagination is in human nature. Even now as I am talking, I am imagining the pictures in the books we have read or the experiments that scientists did, they come to life in my mind. Imagination is very important. For example, take Einstein, he could not prove his theories, but he discovered them in his imagination, and later they were proven... (P3).

... Therefore, I certainly believe that science is intertwined with creativity. I mean, science is born from creativity, to tell the truth. What we call creativity are new things. Something thought differently. This is what science does. Looking at the existing problem in a way that was not thought before, looking with a new perspective; science is in fact the effort to produce a new solution; that is why it is based on creativity... (P4).

Some students expressed that imagination and creativity were supportive in producing solutions and creating products, and that they were necessary for productivity and synthesis. The relevant sample excerpt is as follows:

...Well, let me give you a very simple example. Imagine a farmer. Let's say the farmer has difficulty with some fruit he is trying to pick from a tree and thinks how he can solve the problem. Then, he should use his imagination so that something can be formed in his mind. He must be creative in order to find a solution to this problem. I can give you many similar examples...(P6).

Regarding other codes obtained from the interviews, it is seen that the students expressed that imagination and creativity were among the characteristics of a scientist, and that they were effective in the advancement of science. The relevant excerpt is as follows:

...This is because if a person's imagination has not developed, he can progress within certain standard patterns. But, imagination, creativity, problem-solving skill, creative entrepreneurship skill which we call innovation, presentation skill, all of these must be present in a researcher., I think... You know, we learn something, but after this process, if imagination and creativity step in, we can form more novel and more comprehensive knowledge. This both ensures faster development and increases the variety of the data and knowledge, as I mentioned in our previous interview... (P5).

Table 8: Social and cultural values in science

Codes	Participants						f
	P1	P2	P3	P4	P5	P6	
Guide research	+	+				+	3
Perspective		+				+	2
Pressurizing and suppressing			+				1
Affect starting point-purpose						+	1

Investment in science	+				1
Supportive or unsupportive		+			1
Religious belief			+	+	2
Ethical values		+			1
Understanding of freedom				+	1
Political view			+	+	2
Social environment		+			1
Social structure			+		2
Socioeconomic level			+	+	3
Historical ages				+	1
Technological development	+				1
Interests and needs of society		+		+	3

In Table 8, the codes regarding social and cultural values are presented. It can be stated that the students adopted contemporary understandings of science and expressed that science was affected by social and cultural values. The students stated that depending on the social and cultural values of the society, interest and needs could change, that the society's perspective could guide research, and that the social structure, religious beliefs, and ethical values of the society might affect scientists and therefore science. The relevant excerpt is presented as follows:

... Yes, it is affected by social and cultural values. Whatever the social needs of humans are, I keep coming to the same point; As I believe the starting point of scientific studies is needs, social needs or individuals' status in social life are effective as well. I mean, studies conducted with the perspective of a certain society can also change. For example, no studies defying the values of the society can be done, or in terms of ethical values, a study conducted disregarding these values and considered inappropriate cannot be conducted. In such situations, it may be difficult. Maybe, you would not feel the need for conducting a study. I mean perspective and cultural conditions guide studies conducted. Yes, and this inevitably changes the course of scientific studies... (P2).

Table 9: Theory and law in science

Codes	Participants						f
	P1	P2	P3	P4	P5	P6	
There is hierarchy	+	+			+		3
There is no hierarchy			+	+		+	3
Law superior-theory inferior stage	+						1
Law is more certain	+	+		+	+		4
Law can be proven with experiment			+	+	+		3
Law is recognized by all		+				+	2
Law and theory have different perspectives			+				1
Laws cover theories					+		1
It is difficult to change laws- theories change easily	+				+		2
Law-theory can change			+	+		+	3
Theory is an effort to explain a situation				+			1

Theory is rather related with thoughts			+				1
Theory is not recognized by all		+				+	2
Theory cannot be proven		+	+	+		+	4
Theory can turn into a law		+					1
Theory is not applied		+					1
Theories are newer						+	1
Theories do not turn into laws				+		+	2

Considering Table 9, it is seen that half of the participants adopted modern nature of science understanding and expressed there was no hierarchy between theory and law, while the other half stated that there is a hierarchy between the two, thus showing that they did not adopt modern understanding of science. It was also observed that the participants had difficulty in defining theory and law during the interviews.

Th codes related to contemporary scientific understanding were “law and theory have different perspectives, laws and theories can change, theory is an effort to explain a situation, theory is rather related with thoughts, and theories cannot turn into laws.” The relevant excerpts are as follows:

... No, there isn't. A theory is mostly in a scientific dimension, I mean, it is in the intellectual dimension; it is not definite and false, but we cannot prove it with experiment. But we can prove or show a law with experiment. As a theory, like I said, mass gravity theory is not a law for example. We accept it, but it has nothing to do with a law. Laws are based on experiments, and we can show them. An example for a law is the law of gravity. We can see it by dropping an object, or we can see it in the movements of an object by creating an environment without gravity. Or we can create an environment without air and we can prove the law by dropping objects with different masses and observing them fall in the same way. But, a theory is in the intellectual dimension, and it will take more time to discover and prove it. They have different perspectives, and they have scientific knowledge and changing natures. The theories and laws we accept today can change in future. They are not definite. (P3).

... I know that there is no hierarchy between these two. That is what I remember. In master's courses, in undergraduate courses, and in secondary school coursebooks, I saw many texts saying that the two are different and cannot turn into one another, and I searched it. As far as I can remember, law is proven from different aspects and recognized. Theory is also recognized, but it cannot be directly proven. But, both laws and theories can change. To give an example to theory, take the Big Bang theory; nobody can travel back to the formation of the universe or do extra experiments related to this. Yes, you cannot say it occurred, but you are making inferences from observations regarding its occurrence. (P6).

The codes related to the traditional understanding of science were “law is superior, theory is inferior, law is more certain, laws cover theories, theories can turn into laws, theories cannot be proven.” The relevant excerpt is as follows.

... I actually remember from my university years that there is a hierarchy. Theories are generally tested and approved. I mean, yes, it is also valid as scientific knowledge, but laws, how should I put it, laws are more certain, as I remember. I mean, I can say it is one more step superior. I want to say that laws involve more definite information from a scientific perspective... (P1)..

Table 10: Theory-laden NOS (subjectivity in science)

Codes	Participants						
	P1	P2	P3	P4	P5	P6	f

Science is a product of humans	+	+	+	3
Science is subjective	+		+	2
Scientific knowledge can change-not certain		+		1
It is affected by religious beliefs			+	1
It is universal- objective as it is recognized by all			+	1
Experiment can be proven with observation in science	+			1
Observation is the same, inferences are different	+			1
Personal life-experiences affect the process			+	1
The result is universal and well-accepted	+			1
Experiment cannot be proven with observation in social field and philosophy	+			1
It is affected by social and cultural values			+	1
Knowledge is not certain in social-philosophy field	+			1
It is subjective in social-philosophy field, objective in science field	+			1
Process is subjective, and result is objective	+			1

Considering Table 10, there were differences of students' understandings regarding the theory-laden nature of NOS. Some students stated "science is a product of humans, it is affected by religious beliefs, personal lives, and social and cultural values, observations are the same, but inferences are different," thus emphasizing its subjectivity. The relevant excerpts are as follows:

... As I have always said, I think science is subjective, because as I said, when humans are subjective, what they discover becomes subjective as well. Even if we look at the same thing, we see very different things. The meaning, thought, and expression created in us are different. For example, laws, now everyone recognizes them. Yes, we say there is law of gravity, there is gravity, and it pulls things toward the earth. But still, it may mean different things to people; For some, it means a formula and definition, gravity concept creates a different picture in others. It is the speed of falling of an object. (P3)

... I think scientific knowledge is subjective. It is subjective because it is affected by social and cultural values, religious beliefs, and social structure. (P6).

With statements such as "experiments cannot be proven with observations in the social-philosophy field, knowledge is not definite in social-philosophy field, it is subjective in social-philosophy field, but objective in

science field, process is subjective, but result is objective,” some students expressed that science includes both subjectivity and objectivity. The relevant excerpt is as follows:

... As I said in response to one of the questions, it is necessary to distinguish scientific knowledge in terms of physical sciences and social sciences. Here, social sciences and philosophy are also sciences, and there is scientific knowledge in those fields. But, I think while scientific knowledge is more subjective in social sciences, it is more objective in physical sciences. One of the main reasons for this is that physical sciences depend on experiments, observations, and proof. If we are teaching scientific knowledge in physical sciences in a lesson, we teach them as proven knowledge. But as I said, I am talking from the perspective of physical sciences. In social sciences, especially in a science branch like philosophy, it would not be correct to express it in this way. This is because in these fields, there are no experiments and observations in order to reach definite knowledge. If we give an example from a social studies course, there are some history subjects here, and for these subjects' certain dates are given, but when a dig is performed or a study is conducted, a new discovery is made, and the knowledge changes. In terms of physical sciences, yes, as a result of experiments and observations, many new things are added on each other and can change, but in social sciences, these changes are much more, and these changes are not definite. Or think about philosophy course. It is totally based on thoughts, and thoughts are subjective. So, philosophy course is a course in which personal opinions of people are more intense, and as much as I can remember from my high school years, in this course many people's ideas are mentioned, and these ideas are not related to each other. And we accept all this knowledge as scientific knowledge. We do not accept any of them as false. When looked from this perspective, the existence of various ideas and presenting an assortment of ideas without expressing them as right or wrong show subjectivity rather than objectivity. (P1).

On the other hand, others stated that science was objective as it was universal and recognized by all, and that it was objective as the result was universal and well-accepted. The relevant excerpt is as follows:

... Recognition of scientific knowledge by everyone and thus its gaining a universal aspect make it objective (P5).

4. Discussion

4.1 Discussion on the first research question

It has been determined that students use expressions such as research and inquiry process, understanding nature and the universe, associating science and scientific knowledge, open to change and development, and dynamic continuous while describing science. Therefore, it can be said that the students consider science as an activity open to change and development, which includes understanding nature, especially through the research-inquiry process. There are similar studies in which expressions such as revealing the unknowns of the world and the universe, understanding the world or science emerges in line with the needs for the definition of science (Duruk et al. 2019). However, scientists do their research freely, without practical expectation, for the purpose of satisfying their own curiosities and questioning nature, rather than meeting human needs (Sagan, 2011). When the definitions were examined in depth, it was seen that the students mostly tried to explain their mixed and informed NOS understandings with the assumptions of the positivist paradigm. In addition, it was noted that while they were revealing their understanding of science, they sometimes described science with contradictory words with opposite meanings (Abd-El-Khalick, 2005). This situation increases the possibility that the students, who are potential scientists of the future, will conduct research studies on positivist assumptions and cause many misconceptions about science in their students as science teachers (Morrison et al., 2009). It is important for teachers to have informed understandings of science because these understandings have an important role in students' decision-making processes based on scientific knowledge and in developing contemporary views on science (Duruk et al. 2019; Khishfe, 2012).

4.2 Discussion on the second research question

The students emphasized the features such as being open to change, being verifiable/falsifiable, and being provable, which are thought to be suitable for the contemporary science paradigm, while half of them discussed

the feature of being universal from a positivist paradigm (Table 2). This situation shows that prominent concepts may indicate a mixture of both paradigms.

It has been observed that scientific research is a demonstrative way and it is more frequently mentioned that a certain sequence is followed along this path (Table 3). It can be said that these understandings evoke the myth of scientific method. The scientific method myth is a misconception based on positivist assumptions that science is a monotonous activity and should be carried out in a certain order (Urhahne et al. 2011; Turgut, 2009). This situation increases the possibility of teachers conducting science lessons to transfer this myth to their students. The spread of this myth may cumulatively lead to the perception of science as an objective and standard procedure rather than an activity based on imagination and creativity (Lederman et al. 2002). Therefore, the emphasis that experiments are one of the ways of collecting evidence rather than being a final proof should be emphasized in all teaching settings, especially in case of the possibility of teachers to convey these misconceptions during the conduct of experiments, which are frequently included in science curricula. In the current study, it was seen that the students saw the creative NOS as the initial stage of the research and they often thought of creativity as creating a product. Thinking product-oriented rather than process-oriented and positioning imagination and creativity only in the beginning stage of science is typical positivist approach. Therefore, it can be inferred that the students have an understanding that starts from the myth of the scientific method and uses it in a way that limits the scope of creative NOS. When we look at the literature, it is seen that there are studies on NOS conducted with teachers, in which teachers who participated in the studies stated that imagination and creativity in science are used at every stage of research (Yalvac & Crawford, 2002; Abd-El-Khalick & Akerson, 2004). According to the findings of some studies, teachers state that imagination and creativity are more important in the preparation phase of the research, the experimental phase and the data collection steps (Abd-El-Khalick & Akerson, 2004). Both cases differ from the present study.

All of the students stated that society affects science. They stated that many factors such as the religious thoughts of the society, ethical values, technological literacy levels, education levels and being closed or open to development and change affect science. In this case, it can be said that the students are closer to the contemporary understanding (Khishfe, 2012). It is seen that the students adopted the contemporary view in the dimension of societal NOS and stated that science has a positive effect on the society in general. It is mentioned that the progress in science provides the development of societies, being open to development, change and breaking old-fashioned patterns, and it is mentioned that it provides convenience in many areas such as access to information, communication-communication in the field of health, since it serves the development of societies economically and politically. However, the students did not state a any view that science would have a negative impact on society. When the literature is examined, it is seen that, unlike the current study, Özbudak Kılıçlı & Polat (2015) in his study with pre-service science teachers mentioned that the studies-experiments made by scientists can produce both positive and negative results. Considering that there is no limitless optimism about the benefits of science (Sagan, 2011), it is noteworthy that the students did not state that science can produce negative results.

When asked about the theory-law component, half of the students stated that there was a hierarchy, while the other half stated that there was no hierarchy. While most of the students stated that the theory could not be proven, some students stated that there is a hierarchical relationship between theory and law, and that theories can turn into laws if proven. This situation reveals that they have misconceptions. The present findings are similar to previous studies (Akerson et al. 2006; Liu & Lederman, 2007; Parker et al. 2008). When asked about the theory-laden NOS, the students repeated their responses to other characteristics – such as science is a product of human beings, influenced by religious beliefs. In this situation, it is understood that the students are not aware of what scientists do in their studies in line with a theory, that the theory comes first. Some of the students stated that science is subjective, arguing that it is a human product, and that it is affected by religious beliefs, personal lives, social and cultural values. In contrast, some participants expressed that it is objective because it is supported by experiments and observations in the field of science and is universally accepted by everyone. Students expressing both situations show that the objectivity of science stems from examining objective facts rather than subjective facts, and it is not understood that science should be as objective as possible, as well as being affected by scientists' religious thoughts, worldviews and so on. There are studies in the literature showing that both teachers and students have similar misconceptions (Yalvac & Crawford, 2002).

5. Conclusion

Students has mixed and informed NOS understandings in terms of the characteristics of scientific knowledge and the socio-cultural structure of science. However, they have inappropriate understandings regarding scientific method, law-theory and creative, theory-laden NOS. It has been concluded that they lack informed NOS understandings and explain these understandings with positivist assumptions. In addition, it has been determined that they use the assumptions of the interpretive paradigm more when expressing their understanding of science compared to other components of NOS. Moreover, it was determined that the students believed in some myths about NOS and had misconceptions about law, theory, and the objective and subjective NOS. In order to develop NOS understandings of students who have the potential to become future scientists, it may be suggested to improve NOS in science curriculum. Possible reasons for the different levels of NOS understandings (informed-mixed-inappropriate) can be explored by additional research practice to response the question of why some NOS components show more resistance to change.

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An Evaluation of the Compatibility of the 2019 Turkish Curriculum (The Case of Iğdır Province)

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Abstract

The aim of this article is to examine the curriculum alignment of the current program in line with the opinions of Turkish teachers based on the flexibility of the 2019 Turkish Language Curriculum. The study group for the research consists of a total of 153 teachers, including 40 Turkish teachers who participated in the semi-structured interview in Iğdır in the 2020–2021 academic year and 113 Turkish teachers who gave their opinions about the achievements in order to measure the accessibility levels of the achievements. When the participant comments are examined, it is seen that their statements emphasize the content of the program in terms of intensity and time. It should be noted that teachers express more curriculum fidelity than curriculum alignment. However, it can be said that the concept of curriculum alignment is considered here as a central program implementation algorithm. It can be said that teachers mostly emphasize inner harmony with the alignment of goals. In addition, stating that the achievements are realized within the framework of texts and activities shows that teachers only adhere to the texts and activities in the text book. It was concluded that the students had difficulties in the application because of problems related to the program, and this might be related to local factors.

Keywords: Turkish Language, Curriculum, Curriculum Alignment, Curriculum Evaluation, Teacher Opinions

1. Introduction

The fact that an educated population constitutes a whole society has made teaching and curriculum important not only for today but also for the future education services of the country. When the subject matter is Turkish, that is, "language," it becomes even more important (Aksan, 2015). Language is a structure that is related to, and even creates, other fields and disciplines such as science, art, and technique, all of which are inextricably linked to humans and society. This structure also forms a part of material and spiritual culture. Therefore, people use their ancestors, history, literature, and briefly, culture, while speaking their mother tongue. In this case, it depends on the training given to the students in the curricula and the implementation of the curriculum by the teachers as the implementers of the curriculum. For many reasons, language instruction is crucial to optimizing a student's success. Firstly, it enables individuals to adapt themselves to their countries. Secondly, language enables individuals to open themselves up to different sources in different areas (Eminolu & Tanrkulu, 2018). In elementary school, students learn to read and write at an early age. By the end of the second term of the third

grade, students are able to read and write fluently without interruption. In this day and age, being able to read, write, and do basic math are all critical life skills. Changes in communication, information sharing, and technology in general are occurring at a breakneck pace around the globe in the twenty-first century. Because of the rapidity with which information is being created and consumed, humanity's future rests on our ability to both use and create information. In such a setting, quality education and the instruction of reading and writing, which is its foundation, are necessary (Can & Yavuz, 2017; Güneş, 2003).

This research aims to assist Turkish teachers and curriculum development experts by providing data on how the Turkish curriculum is delivered to students in the province of Idr, which has distinct language and dialect characteristics. In this study, the compatibility of the 2019 Turkish Language Curriculum was evaluated in line with the opinions of Turkish teachers. Thus, the problems encountered regarding the current situation were determined, and the solution proposals developed for these problems contributed to the field. As a result, it is to reveal the compatibility of the current program in line with the opinions of Turkish teachers, based on the flexibility of the 2019 Turkish Course Curriculum. In this way, the problems encountered during the implementation of the curriculum were identified, and solutions were proposed for them.

2. Method

This research was designed according to the case study model, one of the qualitative research designs. Qualitative research can be accepted as a credible research method when it allows for the discovery and understanding of complex issues and when holistic, in-depth research is required (Patton, 2002:14). "The most basic feature of the qualitative case study is the in-depth investigation of one or more cases." In other words, factors related to a situation (environment, individuals, events, processes, etc.) are investigated with a holistic approach. It focuses on how they affect and are affected by the relevant situation. Case studies frequently use more than one data collection method in order to obtain a rich variety of data that can be confirmed (Yıldırım and Şimşek, 2006: 77; Aytaçlı, 2012).

2.1 Participant (Subject) Characteristics

The study group of the research consists of a total of 153 teachers, including 40 Turkish teachers who participated in the semi-structured interview in Iğdır in the 2020-2021 academic year, and 113 Turkish teachers who gave their opinions in order to reveal the actualization levels of the achievements in the curriculum. The sample of the study was formed by easy sampling method.

2.2 Data Collection

A semi-structured interview form was used as a data collection tool in the study. These forms were prepared in two parts in accordance with the purpose of the research. In the first part, there are questions about the personal information of Turkish teachers. In statements regarding personal characteristics, the appropriate option is marked with an (X) sign. In the second part, there are 8 questions that consider the practices of Turkish teachers in the classroom and ask for their statements about program compatibility.

Before preparing the interview questions, a literature review was made and draft questions were prepared for the data collection tool from studies on similar subjects. The draft questions were developed by taking the opinions of two experts and necessary corrections were made.

As the second data collection tool in the study, the scale, which asked teachers to give a value between 10 and 100 for each acquisition, was prepared on the Google form. While the form was being prepared, the most recurring achievements of the 5,6,7 and 8th grade reading, writing, listening/watching and speaking skills in the 2019 Turkish curriculum.

Validity and Reliability of The Research

Internal validity and external validity to ensure the validity and reliability of the research; Studies on internal reliability and external reliability have been carried out.

Internal Validity: Credibility

The internal validity or credibility of a study is related to whether the interpretations reflect reality (Yldrm & imşek, 2005). To ensure consistency in the data collection, analysis, and interpretation processes, the interview questions were first prepared as a draft by conducting a literature review. The prepared questions were developed step by step by taking the opinions of two experts, and necessary corrections were made. To ensure consistency, an opinion chart based on 10-100 scoring of achievements taken directly from the program was created. Turkish teachers were asked interview questions in the same order and tone of voice. The researcher did not interfere with the views and answers of Turkish teachers, and he also avoided expressing his own feelings and thoughts. In order to increase credibility in the research, both data variation and method variation were employed. For this reason, both the word clouds were analyzed with different methods, and the opinions of the participants were included. Accordingly, it was checked whether the findings obtained constitute a meaningful whole, based on irrelevant concepts and the statements of the participants. In addition, a conceptual framework was created based on the relevant literature (Tuncel, 2008).

External Validity: Transferability

Transferability refers to the generalizability of findings and results to similar situations, plans, or events. For this reason, it has been tried to provide transferability by describing the research process, research model, data sources, data collection tools, data collection process, data analysis and interpretation, and how the findings are organized in detail and based on the literature (Tuncel, 2008; Yldrm & imşek, 2005).

Internal Confidence: Consistency

The consistency of a qualitative researcher is expressed through triangulation, expert review, position, and supervision (Merriam, 2013: 213). It has been tried to ensure the consistency of the research by resorting to "data diversity," referring to "expert opinion," and explaining the "researcher's position." In addition, in order to ensure consistency, the opinions of the participants were presented by making direct quotations without adding any comments and without any reference to the researchers' comments (Tuncel, 2008; Coşkun, 2016). In order to ensure consistency, word clouds were also examined together with the views of the participants, so that they were not tied to only one analysis unit.

External Reliability: Confirmability

The repeatability of qualitative research in similar groups is related to its confirmability (Yldrm & imşek, 2005). In order to ensure the confirmability of the research, the researcher stated his position, defined the individuals who were the data source in the research in detail, defined the method and stages of the research, including data collection, analysis, and interpretation, reached results in a clear and detailed manner, and gave information about the research environment (Coşkun, 2016).

2.4 Ethics

Research ethics are as important as the validity and reliability of a study. Ethics, in its most basic form, is a necessary condition for obtaining valid and reliable information. Unethical information may contain distorted and biased information. As a result (Coşkun, 2016:100-101):

- Necessary permissions have been obtained from the relevant institutions and individuals to carry out applications in the study area.
- Participants were interviewed and informed about the purpose of the research; interviews were held on a voluntary basis.
- A suitable ground has been prepared for teachers to express themselves comfortably.
- The purpose of the research and how the data will be collected are explained in detail.
- The researcher avoided directing questions and shared his personal impressions during the interviews and observations.
- Findings are presented truthfully and openly. Every positive or negative result has been reported.
- Information that would decipher the participants was avoided, and the

participants were expressed by coding. While the researchers were coding, each of them was coding according to a number and their professional experience and graduation type, for example, Turkish teacher 10 (1–9 years, undergraduate).

2.5 Data Analysis

The content analysis method was used in the analysis of the data. The basic process in content analysis will be to collect similar data within the framework of certain concepts and themes and to interpret it in a way that the reader can understand (Yldrm and imšek, 2006:227). The coding was shaped according to the concepts obtained from the qualitative data. While analyzing qualitative data, a text analysis tool was used in the MATLAB program (matlabtextanalyticstoolbox). TextAnalyticsToolboxTM provides algorithms and visualizations for preprocessing, analyzing, and modeling text data. While analyzing the data, calculations were made considering the analysis units. The encodings were exhibited in two situations: words and sentences. The analyses are handled by MATLAB according to the frequency of the words, and the most frequently repeated words are expressed in larger fonts, centrally, and in red forms. When the unit of analysis was considered "the most frequently used word," word clouds were used. These word clouds show word frequency analysis applied to raw text data and a processed version. While preparing the word cloud, conjunctions such as less than a certain letter and or were removed. As a result, it was attempted to focus on meaningful words, and the data was cleaned as a result. Secondly, the comments were examined by the n-gram counting method. An "n-gram" is a bunch of n consecutive words. For example, a bigram (where n = 2) is a double-consecutive word like "heavy precipitation." A unigram (where n = 1) is a single word. A bag-n-gram model records how many times different n-grams appear in documents. More information about word order can be found in the original text data using the one-n-gram model. For example, a bag-n-gram model is better suited for capturing short phrases that appear in text, such as "heavy precipitation" and "stormy winds" (TextAnalyticsToolbox, 2020: 7). Here it is possible to sort words according to their repetition in double, triple, quadruple, and more. There is no standard method for choosing this order. In general, analysis was made according to which n-gram was the most significant. In other words, if the most meaningful structure is a 3-word grouping, the data were analyzed as triples. Since the analysis was done in Turkish sentences, we just put three samples of the results in the figures when considering non-native Turkish speakers. Thirdly, it was examined in terms of different combinations according to the theme model. A topic model explores key topics in a text and extracts word possibilities on those topics (TextAnalyticsToolbox, 2020: 16). In this way, it allows for possible interpretations within the text. Fourthly, the statements of the participants were taken as a basis. At this point, the comments of the participants were based on the above word cloud, n-gram counting, and theme model data. Fifth, the opinions of the participants about the achievements and percentage are given. In order to analyze the data in the table more clearly, the percentage contributions of all items were added together, divided by the product of 100 by the number of items, and multiplied by 100 (total percentage/(number of items*100))*100. Thus, the frequency ratio of each dimension was expressed as a percentage (Duran and Topal, 2021).

2.6. The Role of the Researcher

The role of the researcher in qualitative research is to try to reach the feelings and thoughts of the research participants. At this point, while the data was being collected, the primary responsibility of the researcher was to protect the participants and their data. The mechanisms for such protection were clearly explained to the participants during the research process, and it was ensured that they were approved by the relevant research ethics review board before the research began (Sutton & Austin, 2015). Second, interview questions were asked to Turkish teachers in a consistent order and tone of voice. The researcher did not interfere with the views and answers of Turkish teachers, and he also avoided expressing his own feelings and thoughts. Finally, while analyzing the data, the researcher tried to present the data more objectively by seeking expert opinion during the interpretation and analysis of the data in order not to bring their own prejudices or certain dominant views of the participants to the fore.

3. Results

3.1 Findings Related to the Sample of the Study

40 teachers working in Idr province participated in the semi-structured interview form prepared for the compatibility of the 2019 Turkish Curriculum. Among the 40 Turkish teachers who participated in the interview, 25 are female and 15 are male. In terms of seniority, it is 1–9 years at most with 37 teachers, followed by 10–19 years with 2 teachers, and 20–29 years with 1 teacher. The education level of 38 of the 40 Turkish teachers who participated in the interview is undergraduate, and the education level of 2 teachers is graduate. The number of teachers who know the dialect and language characteristics of the region is 21, and the number of teachers who do not know is 19.

Table 1: Information on the Teachers Participating in the Research

Variables	F	%
Gender	Female	25
	Male	15
Seniority	1-9 years	37
	10-19	2
	20-29	1
Education	Undergraduate	38
	Graduate	2
Regional dialect features	Yes	21
	No	19

Out of 113 teacher opinions regarding the accessibility levels of achievements, 70 of them have a seniority of 1–9 years, 22 of them have a seniority of 10–19 years, 8 of them have a seniority of 20–29 years, 2 of them have a seniority of 30–39 years, and 1 of them has a seniority of 40 and above. The education level of 100 of the 113 Turkish teachers is an undergraduate degree, and the education level of 13 teachers is a graduate degree. The number of teachers who know the dialect and language characteristics of the region is 36; the number of teachers who partially know is 17, and the number of teachers who do not know is 60. This situation shows that the majority of the teachers whose opinions were taken do not know the dialect and language characteristics of the region.

3.2. Analysis of Findings Related to the Question "What is Curriculum Compatibility?", which is the main purpose of the research

When the answers to the question "What is the curriculum compatibility?" were examined, it was seen that the majority of Turkish teachers had no idea about the curriculum compatibility. (1-9, Undergraduate), 3(1-9, Undergraduate), 5(1-9, Undergraduate), 6 (1-9, Undergraduate) and 7 (1-9, Undergraduate) Turkish Teachers says "I don't know." When other keywords are examined, it is seen that the concepts related to program compatibility are not sufficient.



Figure 1: A sample of Turkish Word clouds of the answers to the question "What is the curriculum compatibility?"

When the N-gram counting analysis is examined, it is emphasized that the "courses" in the "curriculum" are "handled" "in parallel," and "importantly," the "chosen" "technique." If we express this as a Turkish teacher's (10

When the views of Turkish teachers were examined with theme (topic) model analysis, the concept of curriculum compatibility was emphasized as "the overlapping of the current curriculum with the curriculum-in-use, being appropriate for the grade level." For instance, rather than answering the question, Turkish Teacher 1 (29, 1-9 years, undergraduate) states, "The exam system and the curriculum are not compatible." Turkish teacher 4 (30, 1-9 years old, Bachelor) states, "A more equal distribution of the topics has been made in the fields of Turkish teaching compared to previous curricula." In this sense, the course and the content are transforming. Another Turkish teacher (12, 1-9 years old, Bachelor) states, "Turkish courses are progressing at a very slow pace." The subject of the 5th and 6th grades is very burdensome. "It is appropriate to give the grammar partially in the texts." These comments show that there is a lot of emphasis on the content. It suggests that their conceptual knowledge is not sufficient.

3.3. The Analysis of the Answers to the Question of "Do You Put Curriculum Compatibility in Practice? How?"

When the responses to the question "Do You Use Curriculum Compatibility?" were analyzed, When the question "How?" is posed, it is discovered that the majority of Turkish teachers believe they do this. Turkish teacher 10 (1-9 years old, undergraduate) stated this situation by saying, "Yes. I try to practice each skill by allocating a certain amount of time." Turkish teacher 11 (1-9 years old, undergraduate) stated this situation by stating, "Yes. The curriculum's attainments at each grade level serve as the foundation for the next grade level's attainments. As a result, I try to provide the grade level's target achievements." He also stated that he realized it through the lens of gains.

When the question "Have you already examined the "Turkish Lesson Curriculum" of Turkish teachers? (Can you evaluate them in terms of achievements, visuals, and content?)" is examined, the fact that 33 of them stated that they examined it as an achievement and that they did not evaluate this confirms this situation. Again, when the 5-N-gram counting analysis is examined, it is seen that "to develop the student's comprehension and expression skills" is at the forefront. As emphasized by Turkish teacher 15 (1-9 years, undergraduate), "I try to make the lesson a little simpler by adapting the learning outcomes according to student levels." and Turkish teacher (30, aged 1-9 years, undergraduate) stated, "By managing an interactive process with the activities, I try to keep more students in the center and implement the curriculum." In this context, based on these comments, it can be assumed that students' levels and communication skills are important. When the topic model analysis is examined, it is seen that they achieve program compatibility by "solving the activities and getting support from the necessary resources," "allocating certain times," and "because it forms the basis for the achievements," "providing compatibility," and "coordination."

Turkish teacher 12 (1-9 years old, undergraduate) says, "I'm doing it." by reading the text appropriate to the curriculum and solving its activities. By getting support from additional resources when necessary and using activities and additional resources, Turkish teacher 15 (10-19 years old, undergraduate) stated, "I try to adapt the achievements according to the student's levels and make the lesson a little simpler." He claimed to have realized it within the context of gains. The Turkish teacher, 32 (1-9 years old, undergraduate), said, "No, it is not possible to do it completely." "Because it is necessary to plan these four basic skills as separate lessons." Turkish teacher 33 (1-9 years, undergraduate) similarly said, "Partly. The gains are not very much." It is seen that he emphasizes the difficulty of raising money in terms of time. Turkish teacher 7 (1-9 years, undergraduate) said, "I can't answer because I don't know." Considering that three Turkish teachers gave similar answers, it can be said that they have problems achieving compatibility due to a lack of sufficient knowledge about the subject. According to this, Turkish teachers who said that they realized the compatibility of the curriculum expressed what they did within the framework of achievements, texts, and activities. Turkish teachers, who said that they could not achieve curriculum compatibility, had good knowledge of lesson planning, time, and sufficient knowledge.

3.4. The Analysis of the Answers to the Question "What are the Problems You Encounter Most While Implementing the Curriculum?"

When the analysis of the answers to the question "What are the most common problems you encounter while implementing the program?" was examined, it was noted that in the cloud analysis, reading and writing knowledge were most associated with inadequacy levels. When the answers to this question were analyzed, Turkish teacher

31 (1-9 years, undergraduate) stated that "There are problems in children's reading and writing due to the fact that substitute teachers from some village primary schools attend their lessons." A Turkish teacher of 30 (1-9 years old, undergraduate) stated that there is no student readiness by saying, "The conditions of the school and the level of the students make the teaching of some subjects difficult." "Many features of the region make the subject of proverbs and idioms difficult." Turkish teacher 35 (1-9 years, undergraduate) stated that "grammar subjects are emphasized too much in the coursebooks, and it makes teaching difficult." Similarly, Turkish teacher 36 (1-9 years, undergraduate) said, "Grammar subjects are difficult to understand." It is difficult to explain the subject of 7th grade verbs in the region. They do not understand the inflection of modals and subjects. I'm having a hard time figuring out the meaning of the question. "They cannot find the meaning of proverbs and idioms either." It is seen that the students mostly have problems expressing the grammar subjects. Based on the answers given, it is seen that Turkish teachers in the Idr region generally have problems with verbs, proverbs, and idioms. Another Turkish teacher, 38 (1-9 years old, undergraduate), said, "Grammar gains at grade levels are very high and difficult." Class hours are insufficient for students to acquire reading, writing, listening, and speaking skills. Elective courses can be added for these skills. Listening to texts is insufficient to gain listening skills. The proverbs and idioms are difficult for the children of this region to make sense of. "They speak their own language in class." He mentioned both grammar, proverbs, and idioms, as well as the lack of class hours for skill lessons. In addition, Turkish teacher 29 (1-9 years, undergraduate) says, "The curriculum and the examination system are not compatible, and the readiness levels of the students are not the same." It is understood that students have problems with reading, writing, and reading comprehension due to both the current exam system and the content of the program. This is because the 2019 Turkish curriculum, which wants the grammar acquisitions interspersed in the field of reading and writing skills in the program, contradicts the grammar activities included in the texts in the Turkish textbook. At the same time, the current exam system (LGS) is an exam for reading and reading comprehension skills. Furthermore, there is only one question about spelling and punctuation in the exam. Despite this, it is seen that grammar acquisitions are given a lot of space in both the Turkish curriculum and the Turkish course books.

When the N-gram counting results were examined, it was concluded that the students had difficulties in practice and that this might be related to local factors. In this regard, Turkish teacher 37 (1-9 years old, undergraduate) said, "Student levels are very low." The gains in the curriculum are very difficult and extensive. We cannot award achievements to illiterate students; instead, we must conduct literacy studies." achievement can we effectively give to an illiterate secondary school student?" and Turkish teacher 40 (1-9 years, undergraduate) said, "Student levels are different from each other. There are students who cannot read or write. There are also very good students. "The student's readiness is not sufficient, and he has no interest in the lesson." As he explained, it is evident that there is a problem in applying the student-based program. Likewise, teacher 15 (10-19 years old, undergraduate) emphasized that "students have not acquired the basic knowledge and skills that they should have in primary school, which has been a factor in the failure of the program to be implemented." Apart from this, Turkish teacher 13 (1-9 years, undergraduate) said, "When some reading texts do not attract the attention of village children, the lessons are not given fluently." "We are already having trouble reading because their mother tongue is Kurdish." Similarly, Turkish teacher 11 (1-9 years, undergraduate) said, "The fact that students have gains that do not attract their attention and that they will not use in their daily lives reduces the interest of students in some subjects." For example, grammar subjects (such as adjective, pronoun, adverb, and gerund)" and Turkish teacher 8 (1-9 years, undergraduate) said, "The lack of time in terms of economic conditions creates a problem in fully implementing the program." As emphasized in the following, it is seen that there are problems arising from both the curriculum and infrastructure reasons in the implementation of the program. When the thematic analysis is examined, it is seen that ideas such as lack of activity, lack of fluency in the lessons, the different mother tongues of the children, and the new Turkish curriculum are mostly emphasized in their comments. In this context, considering that their teachers are almost in a position to know the language characteristics of the region, it can be thought that the fact that Turkish teachers do not know the language characteristics of the region will cause a problem in the application of the program, and it can be said that the inadequacies in the previous educational applications may also be effective at this point.

3.5. Analysis of the Answers to the Question "Do You Have Any Recommendations for Preventing Curriculum Incompatibility?"

When the N-gram counting method and word cloud are examined, it is seen that reading, writing, speaking, and listening skills come to the fore. The reason for this is that, as stated by teacher 34 (1-9 years, undergraduate), "reading texts should be shorter at 6th and 7th grade levels." Grammar topics should be given less space. "Elective courses should be offered for reading, listening, speaking, and writing skills apart from the Turkish course" so that they can be related to the density of the grammar subjects. It has been seen that the needs of the region and the skills of reading, speaking, writing, and listening are highlighted. The Turkish teacher (30, aged 1-9) said, "The conditions of the schools and the level of student proficiency should be taken into account more, and a regional program should be prepared." He stated as follows: As Turkish teachers 21 and 22 pointed out by saying, "Conditions and needs of the region should be taken into account," and Turkish teacher 31 suggested, "Regional-specific programs can be prepared." Similarly, the needs of the region were emphasized in the N-gram counting cloud analysis. Reading, speaking, writing, and listening skills are emphasized. In this direction, Turkish teacher 8 (1-9 years old, undergraduate) said, "Doing research and investigations with a large team on enough samples in the field will lead to better results." As he stated, the importance of field work was emphasized. When the topic analysis was examined, it was seen that suggestions were given, such as taking regional needs into account, ensuring equality of opportunity, focusing on literacy skills, and changing the examination system while preparing the Turkish curriculum. When the answers to the question "Do you have any suggestions for preventing program incompatibility?" are examined, the Turkish language teacher 11 (1-9 years old, undergraduate) draws attention to the necessity of focusing on reading and comprehension studies through literary works instead of grammar by stating, "The influence of grammar issues should be reduced and more emphasis should be placed on reading and comprehension studies." "I think that teaching Turkish through literary works will contribute more to the language development of the student." Turkish teacher 12 (1-9 years, undergraduate) supported this idea by stating, "Some texts can be more meaningful and fun." Turkish teacher 34 (1-9 years, undergraduate) similarly stated, "Reading texts at 6th and 7th grade levels should be shorter." Grammar topics should be given less space. "Elective courses should be offered for reading, listening, speaking, and writing skills apart from the Turkish course." The proposal, Turkish Teacher 33 (1-9 years, undergraduate), states that "Examples of activities and sample lesson plans and methods and techniques for reading, listening, speaking, and writing skills can be included in the program." It emphasizes that the Turkish teaching program should be a guide for the teacher in terms of practice. In the third part of the 2006 Turkish Curriculum, there are headings for "Ataturkism," "Table of interdisciplinary field achievements matching the achievements of the Turkish Lesson Curriculum," "the role of the teacher in the implementation of the program," "the features that should be found in the reading texts," "the features that should be included in the content of the materials to be listened to or watched," "the contents that should be included in the 6th, 7th, and 8th grades," "themes," "methods and techniques," "activity examples," "the reading development file," "assessment and evaluation," "assessment and evaluation," "explanations about teaching a lesson," "lecture instruction sample," "dictionary," "methods Among these titles, "methods and techniques," "examples of activities," "reading development files," "assessment and evaluation," "explanations about teaching a lesson," and "an example of teaching a lesson" helped the teacher implement the program. Bulut (2019) drew attention to the fact that one of the outstanding features of the 2006 curriculum is the fact that it includes the type of text, methods, and techniques to be applied in the Turkish lesson. The purpose and application forms are also included in detail. According to Bac, Ayranc, and Mutlu (2017), "The methods and techniques of listening, watching, speaking, reading, and writing are included separately under the methods and techniques of the 2006 Turkish Curriculum, and examples of activities are presented separately for each learning area." is distinctive in a good way. In addition, the researchers stated that the 2006 curriculum's exemplary coursework process and various evaluation forms according to learning areas were the superior aspects of the TCC.

When analyzing the answers to the question, "Do you have any suggestions for preventing program incompatibility?" Turkish teacher 11 (1-9 years old, undergraduate) drew attention to the necessity of focusing on reading and comprehension studies through literary works instead of grammar by stating, "It is necessary to reduce the impact of grammar topics and give more weight to reading and comprehension studies." "I think that teaching Turkish through literary works will contribute more to the language development of the student." This idea is supported by the expressions of Turkish teacher 12 (1-9 years, undergraduate) stating that "some texts can be more meaningful and fun." and Turkish teacher 34 (1-9 years, undergraduate) stating that "reading texts should be shorter at 6th and 7th grade levels." Grammar topics should be given less space. "Elective courses should be offered for reading, listening, speaking, and writing skills apart from the Turkish course." Turkish Teacher 33 (1-9 years, undergraduate) states that "examples of activities and sample lesson plans and methods and techniques

for reading, listening, speaking, and writing skills can be included in the program." So he emphasizes that the Turkish teaching program should be a guide for the teacher in terms of practice. Under the third part of the 2006 Turkish Curriculum, there are the titles "Ataturkism," "Intermediate discipline field achievements table matching with the achievements of the Turkish Course Curriculum," "the role of the teacher in the implementation of the curriculum," "the features that should be found in the reading texts," "the features that should be in the content of the materials to be listened to or watched," "the contents that should be included in 6, 7, and 8th grades," "themes," "methods and techniques," "activity examples", "reading development file," "assessment and evaluation," "explanations about teaching a lesson," "lecture teaching example," " Among these titles, "methods and techniques", "examples of activity", "reading development file", "assessment and evaluation", "explanations about teaching a lesson" and "example of teaching a lesson" helped the teacher to implement the program. Bulut (2019) drew attention to the fact that one of the outstanding features of the 2006 curriculum is that it includes the text type, methods, and techniques to be applied in the Turkish lesson, as well as the purpose and application forms that are outlined in detail. According to Bac, Ayranc, and Mutlu (2017), "The methods and techniques of listening, watching, speaking, reading, and writing are included separately under the methods and techniques of the 2006 Turkish Curriculum, and examples of activities are presented separately for each learning area." is distinctive in a good way. In addition, the researchers stated that the 2006 curriculum's exemplary coursework process and various evaluation forms according to learning areas are the superior aspects of the curriculum.

3.6. Findings of Teachers' Opinions on Outcomes of the Curriculum

The frequently repeated acquisitions for speaking skills (5.6.7 and 8th grades) are given in Table 2.

Table 2: The frequently repeated acquisitions for speaking skills (5.6.7 and 8th grades)

The frequently repeated acquisitions for speaking skills (5.6.7 and 8th grades)	Yes		Partially		No	
	f	%	f	%	F	%
1 Suggests different titles for what they listen/watch.	45	40,2	39	34,8	28	25
2 Makes predictions about the development of events when they listen/watch.	28	25	53	47,3	31	27,7
3 Determines the subject of what they listen/watch.	36	32,1	47	42	29	25,9
4 Summarizes what they have listened/watched.	35	31,3	49	43,8	28	25
5 Answers questions about what they have listened/watched.	43	38,4	40	35,7	29	25,9
6 Vivifies the narrative texts that he/she listens/watches.	34	30,4	37	33	41	36,6
7 Comprehends the speaker's non-verbal messages.	38	33,9	37	33	37	33
8 He/she reports his/her opinions about what they listen/watch.	40	35,7	46	41,1	26	23,2
9 Evaluates the content of what they listen/watch.	34	30,4	45	40,2	33	29,5
10 Implements listening strategies.	36	32,1	41	36,6	35	31,3
11 He/she determines the main idea/main sense of what he/she listens/watches.	40	35,7	38	33,9	34	30,4

In order to analyze the data in the table more clearly, the percentage contributions of all items were added together, divided by the product of 100 by the number of items, and multiplied by 100 (total percentage/(number of items*100))*100. Thus, the frequency ratio of each dimension was expressed as a percentage. Accordingly, when the total score percentages related to the listening and watching skills were taken as the basis of the question, it was seen that the percentage was partially emphasized in the expression. When the table above is examined, 40.2% of the first learning outcome is yes, the second outcome is "partially yes" with a percentage of 47.3%, the third outcome is "partially yes" with a percentage of 42%, the fourth outcome is "partially yes" with a percentage of 43.8%, the fifth outcome is "yes" with a percentage of 38.4%, the sixth outcome is "no" with a percentage of 36.6%, the seventh outcome is "yes" Figure 4 indicates that when the percentage expression of the sum of the percentages of the scores for the listening/watching skill was examined by taking the question as the basis, it was seen that the expression "partially yes" was dominant..

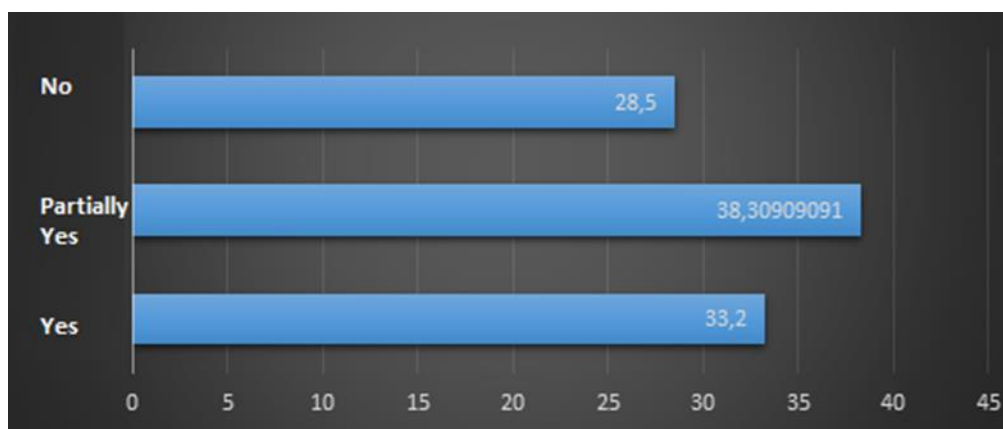


Figure 4: Expressing the sum of the percentages of the scores for the Listening/Watch skill as a percentage based on the question

The frequently repeated acquisitions for speaking skills (5.6.7 and 8th grades) are given in Table 3.

Table 3: The frequently repeated acquisitions for speaking skills (5.6.7 and 8th grades)

Acquisitions for Speaking Skills		Yes		Partially		No	
		f	%	f	%	F	%
12	In his speeches, he uses Turkish words instead of words taken from foreign languages that have not yet settled in our language.	36	32,1	42	37,5	34	30,4
13	Uses words according to their meanings.	41	36,6	38	33,9	33	29,5
14	S/he gives a prepared speech.	38	33,9	45	40,2	29	25,9
15	S/he gives spontaneous speech.	29	25,9	52	46,4	31	27,7
16	He uses body language effectively in his speeches.	37	33	39	34,8	36	32,1
17	Uses appropriate transitional and linking expressions in his speech.	41	36,6	39	34,8	32	28,6
18	Implements speaking strategies.	37	33	34	30,4	41	36,6

In order to analyze the data in the table more clearly, the percentage contributions of all items were added together, divided by the product of 100 by the number of items, and multiplied by 100 (total percentage/(number of items*100))*100. Thus, the frequency ratio of each dimension was expressed as a percentage. Accordingly, when the sum of the percentages for speaking skills is taken as the basis of the question, it is seen that the percentage is partially emphasized in the expression. When the table above is examined, the 13th outcome is “partially yes” with the percentage of 36,6%, the 14th outcome is “partially yes” with the percentage of 40,2%, the 15th outcome is “partially yes” with the percentage of 46,4%, the 16th outcome is “partially yes” with the percentage of 34,8%, the 17th outcome is “yes” with the percentage of 36,6%, and the 18th outcome is “no” with the percentage of 36,6%. When the percentage expression of the sum of the percentages of the scores in speaking skill was taken as the basis of the question, it was seen that the expression was partially dominant.

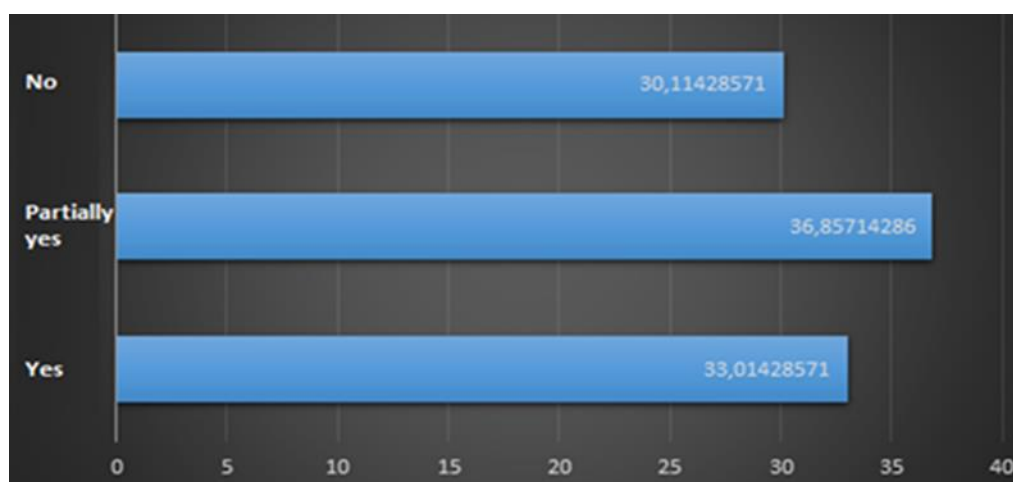


Figure 5: Expressing the sum of the percentages of the scores on the speaking skill as a percentage based on the questions

The frequently repeated acquisitions for reading skills (5.6.7 and 8th grades) were given in Table 4.

Table 4: The frequently repeated acquisitions for reading skills (5.6.7 and 8th grades)

Learning Outcomes for Reading Skills		Yes		Partially Yes		No	
		f	%	f	%	F	%
19	Reads aloud and silently, paying attention to punctuation marks.	38	33,9	38	33,9	36	32,1
20	Reads the text in accordance with the characteristics of the genre.	38	33,9	37	33	37	33
21	Applies reading strategies.	37	33	37	33	38	33,9
22	Reads texts written in different fonts.	39	34,8	38	33,9	35	31,3
23	Determines the contribution of idioms and proverbs to the meaning of the text.	36	32,1	41	36,6	35	31,3
24	Guess the meaning of unfamiliar words and phrases using the context.	43	38,4	31	27,7	38	33,9
25	Predicts the subject of the text to be read from the visual and the title.	46	41,1	34	30,4	32	28,6
26	Asks questions about the text.	43	38,4	39	34,9	30	26,8
27	Answers questions about the text.	52	46,4	33	29,5	27	24,1
28	Determines the subject of the text.	36	32,1	52	46,4	24	21,4
29	Determines the main idea / main emotion of the text.	35	31,3	44	39,3	33	29,5
30	Determines the appropriate title for the content of the text.	49	43,8	36	32,1	27	24,1
31	Identifies the story elements in the text.	41	36,6	45	40,2	26	23,2
32	Answers questions about the image.	48	42,9	36	32,1	28	25
33	Comprehends the way of emphasizing important points in the text.	40	35,7	30	26,8	42	37,5
34	Makes comparisons between texts.	40	35,7	37	33	35	31,3
35	Uses information resources effectively.	32	28,6	37	33	43	38,4
36	Distinguish the real and fictional elements in the text.	45	40,2	36	32,1	31	27,7
37	Distinguish between text types.	39	34,8	41	36,6	32	28,6

When the table above is examined, 19th outcome is “partially yes” with the percentage of 33,9%, 20th outcome is “partially yes” with the percentage of 33,9%, 21th outcome is “no” with the percentage of 33,9%, 22th outcome is “yes” with the percentage of 34,8%, 23th outcome is “partially yes” with the percentage of 36,6%, 24th outcome is “yes” with the percentage of 38,4%, 25th outcome is “yes” with the percentage of 41,1%, 26th outcome is “yes”

with the percentage of 38,4%, 27th outcome is "yes" with the percentage of 46,4%, 28th outcome is "partially yes" with the percentage of 46,4%, 29th outcome is "partially yes" with the percentage of 39,3%, 30th outcome is "yes" with the percentage of 43,4%, 31th outcome is "partially yes" with the percentage of 40,2%, 32th outcome is "yes" with the percentage of 42,9%, 33th outcome is "no" with the percentage of 37,5%, 34th outcome is "yes" with the percentage of 35,7%, 35th outcome is "no" with the percentage of 38,4%, 36th outcome is "yes" with the percentage of 40,2%, 37th outcome is "partially yes" with the percentage of 36,6%. When the percentage expression of the sum of the percentages of the scores for the reading skill was taken as the basis of the question, it was seen that the expression "Yes" was dominant.

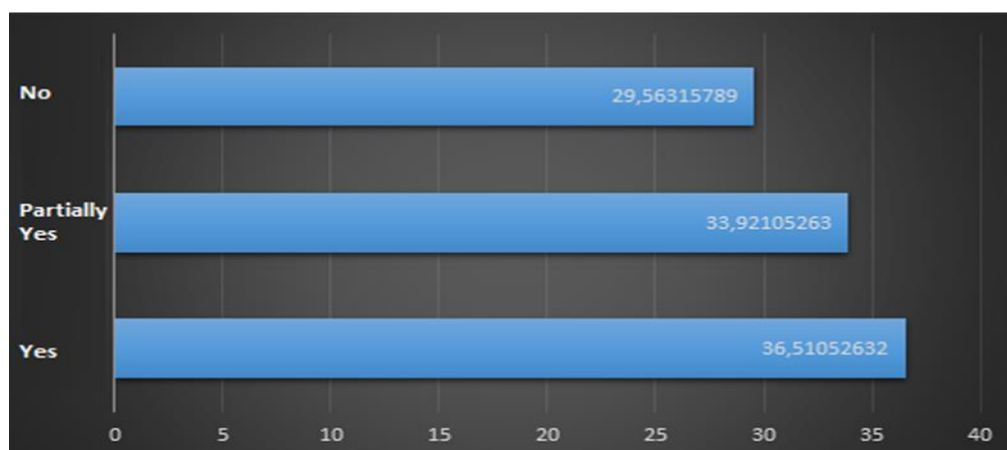


Figure 6: Expressing the sum of the percentages of the scores for the reading skill as a percentage

The most frequent Learning Outcomes for Writing Skill (5.6.7 and 8th) are given Table 5.

Table 5: The most frequent Learning Outcomes for Writing Skill (5.6.7 and 8th)

Learning Outcomes for Writing Skills		Yes		Partially Yes		No	
		f	%	f	F	%	F
38	He writes poetry.	39	34,8	42	37,5	31	27,7
39	Writes short texts.	37	33	41	36,6	34	30,4
40	Writes narrative text.	47	42	35	31,3	30	26,8
41	Implements writing strategies.	41	36,6	30	26,8	41	36,6
42	Fills the forms in accordance with the instructions.	50	44,6	34	30,4	28	25
43	Determines a suitable title for the content of what you write.	53	47,3	32	28,6	27	24,1
44	He shares what he wrote.	52	46,4	33	29,5	27	24,1
45	Edits what he wrote.	33	29,5	37	33	42	37,5
46	Writes informative texts.	31	27,7	38	33,9	43	38,4

When the table above is examined, the 38th outcome is "partially yes" with the percentage of 37.5%, the 39th outcome is "partially yes" with the percentage of 36.6%, the 40th outcome is "yes" with the percentage of 42%, the 41st outcome is "yes" and "no" with the same percentage of 36.6%, the 42nd outcome is "yes" with the percentage of 44.6%, the 43rd outcome is "yes" with the percentage of 47%. When the percentage expression of the sum of the percentages of the scores for the writing skill was examined by taking the question as the basis, it was seen that the expression "Yes" was dominant.

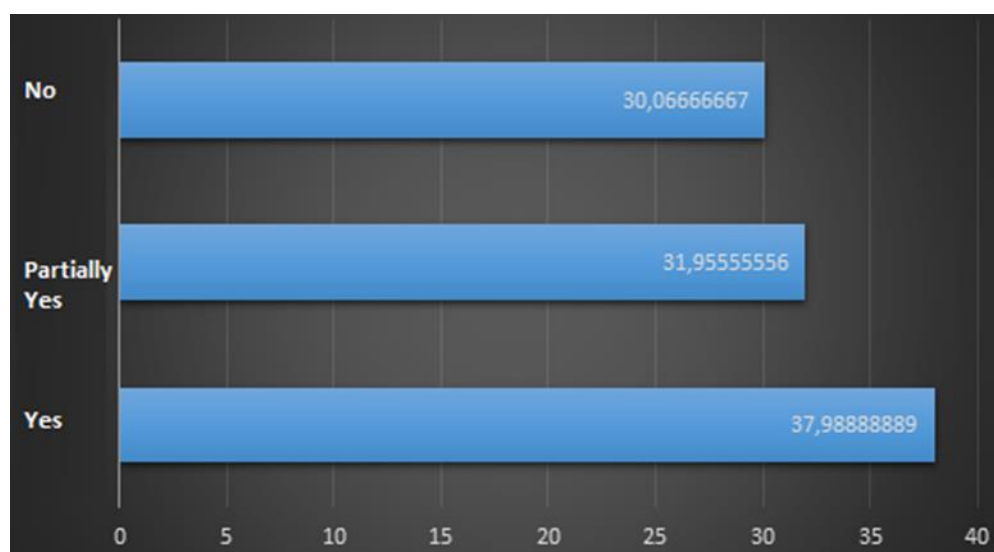


Figure 7: Expressing the sum of the percentages of the scores for the writing skill as a percentage

4. Discussion And Conclusion

From the word cloud analysis of the answers to the question "What is curriculum compatibility?" it was seen that teachers have no idea about program compatibility. Since it focuses on a single word, it can be justified that no meaningful concept emerges, or it can be concluded that the participants do not really have enough information on this subject. In this respect, when we look at the n-gram counting method, we see that the curriculum and the lessons are processed in parallel, and the method in the program is technical and, most importantly, it gives lessons in accordance with the chosen approach. Similarly, when the topic model and possible scenarios are considered, it is emphasized that the curriculum overlaps and is suitable for the grade level. When the participant comments are examined, it is seen that their statements emphasize the content element of the program in terms of intensity and time. As a result, curriculum compatibility with the n-gram counting method is considered to be both temporal and methodological. Temporal compatibility is an important concept here because it shows that teachers see themselves as passive practitioners in the curriculum. Likewise, although some of the teachers refer to the student orientation of the program as "the compatibility of the objectives and achievements of the program with the interests, wishes, and needs of the students," they show that they neglect the teacher aspect of the program, namely teacher agency, because the curriculum is viewed as a passive document that can be read and directly implemented. Curriculum compatibility, as Lezotte (2002) emphasizes, can be compared to the process of starting with the finished product (the student being assessed) and tracing back steps to clearly visualize the learning journey in ways that are meaningful to the teacher. The teacher should commit to asking himself what evidence will be needed to test the range of students' knowledge acquisition and synthesis. This process will enable the teacher to confidently determine what kind of degree of matching exists between the intended curriculum and the evaluated curriculum. As Lezotte (2002:9) reiterates, as a teacher, one must be convinced in his or her mind and heart that if s/he teaches the targeted curriculum and the students learn about it, they will perform well on the assessment criteria. When it is considered that a teacher or a group of teachers are active, making choices or taking a stance in this context in a way that may affect their work and professional identity (Eteläpelto, Vähäsantanen, Hokkä, & Paloniemi, 2013; cited in Bellibaş, Gümüş, & Caliskan, 2019), a teacher-centered approach is emphasized at this point. It can be said that one reason for this is the teacher's expectation to be an intermediary that implements the central curriculum. At this point, it has been observed that teachers mostly refer to Posner's (2004) Official Curriculum (Clear—Written) and Curriculum in Practice (Real Program), and they emphasize the Neglected Curriculum (Null) in terms of content and time. For this reason, it can be concluded that there is a problem between the official and the neglected curriculum, that the reason is due to the content of the curriculum, and that they perceive the compatibility of the curriculum as the overlap between the applied program and the official program. "The concept of curriculum compatibility is explained as the curriculum determined centrally by the ministries of education and the curriculum applied by the teachers in the teaching process" (zpolat Turan & Bay, 2015). In this regard, it can be said that teachers have an understanding of curriculum compatibility according to this definition. It should be noted that teachers express curriculum commitment more than compatibility. However, it can be said

that the concept of curriculum compatibility is considered here as a central program implementation algorithm. There are different levels of curriculum compatibility, however. According to Fraser and Bosanquet (2006), the first level of it expresses the content and structure of a single unit. The second category focuses on curriculum-level content and structure. Both categories require a product-based understanding of the program. In the third category, the curriculum is understood in terms of the student's learning experience. The fourth category, curriculum, approaches the co-construction of knowledge between student and teacher. These last two categories are characterized by a process-based approach. According to Biggs and Tang (2007), curriculum compatibility—the constructive consistency between teaching, learning, and assessment—is a crucial aspect of the quality of teaching. In order for the learning objectives to become real learning outcomes and thus optimize students' learning, it is important to make sure that each activity helps to achieve the learning objectives (Wijngaards-de Meij & Merx, 2018). At this point, it can be concluded that teachers' perceptions of curriculum coherence are at the level of the first two structures; very few of them point to the third level by emphasizing the student; and they neglect the fourth category by not making enough reference to teacher activity. For this reason, it can be stated that teachers look at product-based program compatibility and neglect process-based harmony.

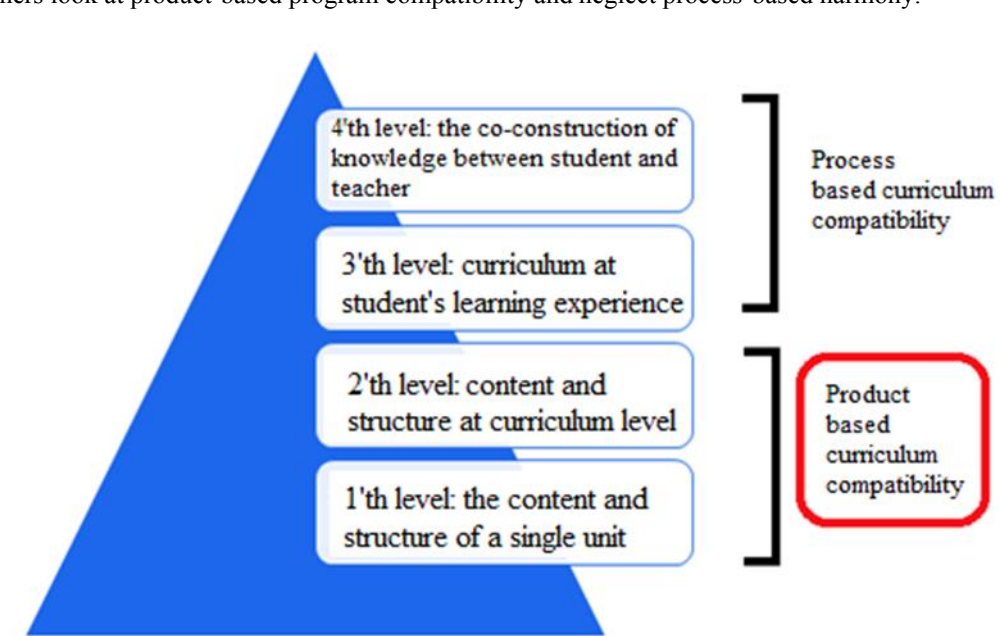


Figure 8: Findings suggest that teachers have a product-based understanding of curriculum compatibility.

However, the harmony between the intended and evaluated training programs should not be read as a one-way process. This is not only the case of teachers showing that they are fully aware of the expectations of the curriculum developers, but also the case that other stakeholders themselves are fully aware of the content of the curriculum and the teaching method. The curriculum ensures that appropriate levels are set between instruction and assessment. Therefore, the prerequisite for any coherent educational strategy is that the goal of providing every student with learning opportunities and justifying their achievements can be fulfilled.

When we look at the analysis of the answers to the question, “Do You Put Curriculum Compatibility into Practice?” How?” The word cloud analysis shows that the majority of Turkish teachers think that they do this. When the 5-N-gram counting analysis is examined, it is seen that “to develop students' comprehension and expression skills” is at the forefront. Again, when the topic analysis is examined, it is seen that they achieve program compatibility by “solving the activities and getting support from the necessary resources,” “allocating certain times,” and “because it forms the basis for the achievements,” “providing compatibility,” and “coordination.” From this point of view, it can be stated that teachers emphasize instructional adaptability. In instructional compatibility, it can be said that the compatibility between teaching and assessments is mostly mentioned, while the expression of program compatibility has a more general framework, and it can be said that the harmony here covers all the elements (zpolat Turan and Bay, 2015: 19). At this point, there are two types of fit: internal and external. Internal compatibility is the process of ensuring that teaching and learning activities, assessments, and goals are compatible, while external compatibility is derived from a single course (e.g., basic concepts of physiology,

professional skills) that points to standardized factors that are independent (Shaltry, 2020). For this reason, it can be said that teachers mostly emphasize inner harmony when it comes to the compatibility of goals. In addition, stating that the acquisitions are realized within the framework of texts and activities shows that teachers only adhere to the texts and activities in the textbook. The absence of alternative activities and studies may be an indication of a one-dimensional approach.

When the analysis of the answers to the question “What are the most common problems you encounter while implementing the program?” was examined, it was noted that in the cloud analysis, reading and writing knowledge were most associated with the inadequacy levels of the students. When the N-gram counting results were examined, it was concluded that the students had difficulties in practice and that this might be related to local factors. When teacher statements were examined, it was seen that this was mainly associated with achievements being higher than student competencies. In addition, it contradicts the 2019 Turkish Curriculum, which wants the grammar acquisitions interspersed in reading and writing skills and the grammar activities included in the context of the text in the Turkish textbook. However, the current exam system (LGS) is an exam for reading and reading comprehension skills. It is seen that there is only one problem with spelling and punctuation. Despite this, giving too much space to grammar acquisitions in both the Turkish Curriculum and the Turkish course book leads to the conclusion that it is inconsistent. Similarly, when the topic analysis is examined, there are ideas such as lack of activity, not being fluent in the lessons, the mother tongue of the some of the children being Kurdish, and the newness of the Turkish curriculum. It was stated that there were more problems with grammar, proverbs, and idioms. It can be thought that the fact that Turkish teachers do not know the language characteristics of the region will cause a problem in the application of the curriculum, and it can be said that the inadequacies in the previous educational curricula may also be effective. At this point, it can be said that the flexibility of the training program is emphasized. The flexibility of the education program means that it can be arranged according to the economic and social characteristics of the region as well as the interests and needs of the students. In addition, a training program should assist practitioners and be applicable. In this respect, it can be said that teachers have problems in terms of flexibility, helpfulness, and applicability of the Turkish education program. In the study of Avc (2018), in which he examined the views of teachers and students on teaching the 5th grade Turkish lesson in the context of the Turkish curriculum (2018), the curriculum did not meet socio-cultural differences, was not compatible with individual needs, and teachers did not conduct the course in accordance with the program's approach or the course content from time to time stated that it was above the student level and reached similar findings. In the study of Menteşe (2013), in which the opinions of the teachers about the Turkish lesson curriculum were examined, it was determined that students encounter different problems, such as unequal levels and not finding the course materials sufficient.

When the analysis of the answers to the question “Do you have any suggestions for preventing program incompatibility?” is examined, it is seen that reading, writing, speaking, and listening skills come to the fore in the N-gram counting method and word cloud method. When the topic analysis was examined, it was seen that suggestions were given, such as taking into account regional needs, ensuring equality of opportunity, focusing on literacy skills, and changing the exam system while preparing the Turkish curriculum. In this regard, it can be said that teachers focus on skills rather than knowledge and emphasize that regional differences and needs should be taken into account. When the percentage expression of the sum of the percentages of the scores for listening and speaking skills is examined by taking the question as the basis, it is seen that the expression is partially dominant. When the percentage expression of the sum of the percentages of the scores for reading and writing skills is examined by taking the question as the basis, it is seen that the expression "yes" is dominant. In this respect, it can be stated that while the teachers see the program as more positive in terms of reading and writing skills, it is partially positive in terms of listening, watching, and speaking skills. However, it should be emphasized that the rates are close to each other. In the study of Dur (2014), in which primary and secondary school teachers, students, and parents' views on the renewed Turkish curriculum and its implementation were examined, it was determined that teachers reported positive opinions about reading, speaking, and writing achievements but partially positive opinions about listening and watching achievements, which is in line with the findings of this study. Er (2011) stated in his study that it is difficult to use measurement tools in the field of listening and watching learning, and that it is therefore necessary to increase the number of listening and watching texts, decrease the number of activities, include interesting text types, and increase the required time. They revealed that textbooks should be prepared according to the characteristics of the regions. Different in-service activities and incentives should be

developed to increase teachers' experiential and theoretical knowledge and motivation regarding curriculum compatibility. While updating the curriculum, the opinions and suggestions of Turkish teachers about the program should be taken into account. In order to improve listening/watching, speaking, reading, and writing skills in the curriculum, improvements should be made by considering student needs, regional differences, and current problems. Curriculum compatibility focuses on curriculum and instruction. Therefore, teachers should know how to teach better as well as what students need to learn. Planning the curriculum contents according to the best method, technique, and strategy in teaching also makes it necessary to use time effectively. Teachers need time to spread this knowledge throughout the school year to increase student success. Curriculum compatibility should be left to teachers. Thus, teachers should be empowered to carry out the adaptation process and ensure consistency throughout the entire academic year.

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School Quality Assurance Applications for Basic Education Schools*

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Abstract

This study aims to recommend applications of quality assurance for schools of basic education by analysing the school quality assurance applications of some countries which were successful at international tests and by interviewing university lecturers. This current study first analyses the quality assurance applications used in schools in some countries which achieved success at international tests. Thus, the school quality assurance applications in Estonia, Hong Kong and New Zealand were described. In addition to that ten university lecturers were also interviewed within the scope of this study. The data for the countries were collected by the document analysis method, and the views of the faculty members were collected by the interview method. The data were analysed in sub-themes such as the quality assurance applications used in schools in some countries which achieved success at international tests, the stake holders in the applications, how often the applications were used and in what processes they were used. As a result of the interviews, similar themes were classified. It may be recommended in the light of the results obtained that external evaluation should be made for self-evaluation and that national beside international tests should be used as data for school quality assurance applications. In addition, it is revealed how self-evaluation and external evaluation practices can be shaped.

Keywords: External Evaluation, Quality Assurance, Qualitative Research, Self-Evaluation

1. Introduction

Quality is a concept which involves several stakeholders; which needs considering in economic, political and social contexts; which is dynamic and is constantly changing; which is in search of perfection and which is multidimensional. Therefore, it is a term difficult to define (Schnindler, Puls-Elvidge, Welzant & Crawford, 2015). It is difficult to define due to two reasons. Namely, quality is a relative concept and it is also used in various contexts. Quality as a relative concept is the fact that a situation or a product which is considered as of good quality by a person can be considered as of low quality by another person. Besides, each individual can have different perceptions of quality. The word quality can have different meanings owing to the fact that the standards expected to be met in each case differ (Elassy, 2015).

* This article was produced from Asuman YILMAZ ŞEN's doctoral thesis.

It is the synthesis of theory and practice. It is not a procedural or linear process, but it contains complicated actions (Holt, 2000). On the other hand, the term can also be defined as perfection, suitability for use, compliance with specifications, compliance with needs, avoidance of faults and as meeting customers' expectations (Elshennawy, 2004).

Quality in education is a multidimensional concept which cannot be considered only in one single indicator. It is the characteristics of the elements of input, process and output available in the educational system which offers services to meet the explicit and implicit expectations of internal and external stakeholders (Cheng, 1995). According to Ng (2015), good quality education lays emphasis on holistic development. Holistic development expresses students' development both in artistic, sportive, non-academic areas and development in their character and interpersonal skills. Good quality education equips students with knowledge and skills directed to the future. What prepares them to life is the acquisition of 21st century skills, of social-emotional skills and of critical and creative thinking. In addition to that, such education also teaches good values such as respect, affection, politeness, honesty and compassion. It also helps students to develop positive attitudes towards learning.

European Commission (2015) defines quality in education as the acquisition of basic efficacies by students, the equalitarian and inclusive schooling systems, performing perfection activities in schools and as enabling students' transition from schools into business markets or into further education.

Quality in education is achieved by carrying out systematic management, supervision, achievement monitoring and quality development activities (Bakioğlu and Baltacı, 2017). On the other hand, quality assurance has different meanings for politicians, educators and stakeholders. While it means providing educations so as to add value to money for politicians, it means focusing on how to conduct better educational activities at school for educators. It is the availability of transparency for stakeholders (Mathews, 2010). In this context, quality can be regarded as a significant indicator for schools.

A system of quality management capable of meeting the expectations of continuously changing conditions should be suggested and the quality of the system rather than the quality of products and services should be focused on so as to be able to assure quality. Quality can be assured only by suggesting a quality management system which constantly improves itself (Ilkay & Aslan, 2012). Quality assurance is defined as a series of integrated policies, activities, procedures, rules, criteria, confirmation instruments and mechanisms designed together in order to provide and improve the quality suggested by educational institutions (European Union, 2015). Quality assurance is the management instrument which can contribute to improving the performance in institutions or in the units of institutions (Doherty, 2008).

Two elements are emphasized in the definitions of quality assurance. Accordingly, it is emphasized in the first element that quality assurance is a series of processes, policies and actions performed in cooperation with quality assurance agents and accreditation bodies externally and by institutions themselves internally whereas it is emphasized in the second that quality assurance is the statement of quality properties related to sustaining continuous development and accountability (Schindler, Puls-Elvidge, Welzant & Crawford, 2015).

Quality assurance applications differ from country to country in terms of instruments, processes and stakeholders available. Yet, the ultimate purpose of the applications is to secure that students have the best possible opportunities for learning and thus to improve learning and teaching. On the other hand, applications of quality assurance are also used in meeting the standards set in the national qualifications framework, in distributing the resources effectively and fairly, in providing additional support by identifying risky schools and in sharing the good applications to support school development (European Commission, 2018).

This study aims to recommend applications of quality assurance for schools of basic education by analysing the school quality assurance applications of some countries which were successful at international tests and by interviewing university lecturers. The research questions formulated in this context are as in the following:

- 1- What school quality assurance applications are used in schools in some countries which achieve success at international tests?

- 2- What views do university lecturers hold in relation to quality assurance applications that can be used in schools of basic education?
- 3- What recommendations can be made for quality assurance applications that can be used in schools of basic education?

2. Method

2.1 The Subsections of the Research

The data collected within the scope of this study were put to descriptive analysis- which is defined as “summarising and interpreting the collected data according to pre-distinguished themes” (Yıldırım and Şimşek, 2013:224). The data were analysed in sub-themes such as the quality assurance applications used in schools in some countries which achieved success at international tests, the stake holders in the applications, how often the applications were used and in what processes they were used. The information the themes distinguished for the countries and for the interviews is shown in Table 2.

Table 2: The Themes Distinguished

	Themes	Sub-themes
1	The concept of quality in schools	
2	Applications available in the model	
3	Self-evaluation	Stake holders How often Measurement and evaluation instruments Requirements
4	External evaluation	Stake holders How often Measurement and evaluation instruments Requirements
5	National stake holders surveys	
6	National test results	
7	International test results	
8	Sharing the reports	
9	Rewarding and certification	

Accordingly, the themes distinguished at the end of the interviews are shown in the Table. Thus, views on the concept of quality in schools were obtained and data concerning the applications that should be included in the model and the stake holders in the applications, periods of time, measurement and evaluation instruments and requirements were collected. Besides, it is also apparent from the Table that views on sharing the evaluation reports and on rewarding and certification according to evaluation results were stated.

2.2 The Study Group

This current study first analyses the quality assurance applications used in schools in some countries which achieved success at international tests. Thus, the school quality assurance applications in Estonia, Hong Kong and New Zealand were described. In addition to that 10 university lecturers were also interviewed within the scope of this study. Table 1 below shows the demographic information concerning the lecturers who were interviewed.

Table 1: The Interviewees' Demographic Properties

	Codes	Jobs/Titles	Gender	Place of employment
1	L1	Lecturer- Professor Dr.	Male	Higher education
2	L2	Lecturer- Dr.	Male	Higher education
3	L3	Lecturer- Assoc. Professor Dr.	Male	Higher education

4	L4	Lecturer- Assoc. Professor Dr.	Male	Higher education
5	L5	Lecturer- Assoc. Professor Dr.	Male	Higher education
6	L6	Lecturer- Professor Dr.	Male	Higher education
7	L7	Lecturer- Assoc. Professor Dr.	Male	Higher education
8	L8	Lecturer- Dr.	Female	Higher education
9	L9	Lecturer- Dr.	Female	Higher education
10	L10	Lecturer- Assoc. Professor Dr.	Female	Higher education

As clear from Table 1, 10 lecturers were included in the research. 3 of the participants were professors while 4 of them were associate professors and 3 were doctors. Each participant worked in an institution of higher education and 7 of them were male whereas 3 were female.

2.3 Measures

The research data were collected through interviews with the lecturers and through document analysis. The information on quality assurance applications for countries which constituted the study group in the current study was obtained from printed scientific resources such as books, journals, theses and articles. The websites of international organisations such as OECD and EURYDICE were also consulted for data on important documents. The validity and reliability of the data can be said to be high due to the fact that the data collection tools were the up to date documents on the subject of research which were legal and accessible. On the other hand, the interview texts were analyzed using the descriptive and content analysis technique. In order to ensure internal validity in the study, the opinion of a field expert was taken. The process carried out in order to ensure the external validity of the research was clearly stated and the systematic study was supported by the document. Findings are presented with frequency values. Findings are given using direct quotations without comment.

3. Results

3.1 School Quality Assurance Applications Used in Schools in Some Countries Which Achieve Success at International Tests

School quality assurance applications differ from country to country. While self-evaluation is made for external evaluation in some countries, external evaluation is made for self-evaluation in some countries. And some other countries aim to combine self-evaluation with external evaluation. The school quality assurance applications used by schools in some countries which achieved success at international tests were analysed in this current study.

It was found in the theme of applications available in the model that surveys on self-evaluation, external evaluation, centrally held tests and national stake holders' satisfaction were carried out in Estonia (European Commission, 2020a; European Commission, 2020b). On the other hand, self-evaluation and external evaluation came into prominence in Hong Kong and New Zealand (Hong Kong. Education Bureau, 2020a; New Zealand. Education Review Office, 2016).

Sub-themes such as stake holders, how often, measurement and evaluation instruments and requirements were distinguished in the theme of self-evaluation. An examination of stake holders who played roles in the countries' measurement and evaluation process showed that school administrators, teachers, students and parents were available in the process in Estonia, New Zealand and Hong Kong. It was reported that boards of trustees were also available as stake holders in the process of self-evaluation in New Zealand and Estonia (European Commission, 2015; Hong Kong. Education Bureau, 2020b; Nusche, Laveault, MacBeath & Santiago, 2012). On examining how often the countries made self-evaluation, it was found that self-evaluation was made once a year in New Zealand and in Hong Kong whereas it was made at least once in the school development plan in Estonia (Santiago et al., 2016; Hong Kong. Education Bureau, 2020c; New Zealand. Education Review Office, 2021). As to the countries' process of self-evaluation, the process was shaped by school administrators in New Zealand and Estonia (New Zealand. Education Review Office, 2021; European Commission, 2015). It also became apparent that school development plans and action plans were prepared in Estonia and Hong Kong (European Commission, 2015; Hong Kong. Education Bureau, 2020b).

Sub-themes of stake holders, how often, measurement and evaluation instruments and requirements were distinguished in the theme of external evaluation. On examining the stake holders available in the countries' external evaluation applications, it was found that the authorities of the Ministry of Education and Research were prominent in Estonia and that the authorities of the Office of Education were prominent in Hong Kong (Estonia. Ministry of Education and Research, 2016; European Commission, 2020a; Hong Kong. Education Bureau, 2022). School administrators, teachers, students and parents were found to be involved in the process of external evaluation in New Zealand and Hong Kong (Hong Kong. Education Bureau, 2022; New Zealand. Education Review Office, 2021). It was also reported that boards of trustees or units called parent-teacher association took on roles in external evaluation in Estonia (European Commission, 2020a; European Commission, 2020b; Estonia. Ministry of Education and Research, 2016). An examination of how often the countries made external evaluation demonstrated that external evaluation was made every three years by considering the duration of schools' development plans in New Zealand and Hong Kong (Hong Kong. Education Bureau, 2022; New Zealand. Education Review Office, 2021). It was also found that the frequency could change depending on schools (Nusche et al., 2012).

The activities may be classified as pre-evaluation, evaluation and post-evaluation on examining the countries' process of external evaluation. School development plans, annual action plans and school reports are submitted to evaluators and contact meetings are held in Hong Kong during pre-evaluation (Hong Kong. Education Bureau, 2022). The evaluation process lasts eight working days in Estonia (European Commission, 2020b). Classroom observations are made in New Zealand and Hong Kong (New Zealand. Education Review Office, 2016; Hong Kong. Education Bureau, 2022). Students' homework files are also examined in Hong Kong (Hong Kong. Education Bureau, 2022). In New Zealand, on the other hand, guidance activities are done in relation to school development plans (New Zealand. Education Review Office, 2016). As post-evaluation, the draft reports are prepared by evaluators, schools answer the questions available in the draft reports and the reports are given the final shape in Hong Kong (Hong Kong. Education Bureau, 2022).

National stake holders survey is done in Estonia within the scope of school quality assurance applications. Parents, students and teachers are included in the surveys (European Commission, 2020a; European Commission, 2020b). On examining the centrally held tests in the countries, it was found that standard setting tests and state tests were given by the institution of state and youth in Estonia. The test results are used as data in the context of schools' quality assurance (European Commission, 2020a; European Commission, 2020b).

While the reports prepared as a result of the external evaluations made in the countries are shared on the internet sites of the schools in Hong Kong, they are shared on the sites of the Ministry of Education in New Zealand (Hong Kong. Education Bureau, 2022; New Zealand. Education Review Office, 2021). The reports are shared with other schools, the system data are created and the data are broadcast annually in Estonia. The reports prepared as a result of self-evaluations are converted into statistical data in Estonia and are broadcast on schools' internet sites (European Commission, 2020b). In Hong Kong, however, school development plans which are made as a result of self-evaluation reports are broadcast on schools' internet sites (Hong Kong. Education Bureau, 2020b).

3.2 The Views of University Lecturers Hold in relation to Quality Assurance Applications that can be used in Schools of Basic Education

Table 3 shows the lecturers' views on the concept of quality in schools.

Table 3: Codes for Theme One according to the Lecturers' Views

The concept of quality in schools	The quality of education and instruction (L1)- (L3)- (L10)
	Attaining the goals set in the curriculum (L1)- (L10)
	An environment where students and teachers feel happy (L1)- (L9)
	Displaying the school goals in multi-dimensional form (L2)
	School administrators' and teachers' qualities (L4)- (L8)- (L9)
	Schools having a climate of values (L5)- (L8)- (L9)
	A school which has factors strengthening sense of belonging (L5)

An inviting school (L5)- (L9)
A positive climate (L5)
Building a sense of quality on the school's own values (L6)
A school which has a professional approach (L7)
Schools' ability to activate their managerial and educational instruments functionally (L7)
A school with a culture of consensus (L7)
A school of multivocality (L7)
A school which is in search of standards and which continuously updates its standards (L7)
A school which respects children's rights and which is inclusive (L8)
A school which has adequate and suitable physical possibilities (L4) (L9)

Table 3 shows the views on the concept of quality in schools, on the quality of education and instruction and on the quality of school administrators and teachers. Accordingly, positive climate in schools is also considered important in terms of quality of schools. An example for participants' views is as in the following:

"As to school quality, there should be an atmosphere which will make teachers and students in a school say 'fortunately I am here' L: 5

On the other hand, a school which is safe is considered as a school of good quality. A participant view illustrative of this is as in the following:

"Quality in schools... is the professional reciprocation of all the processes that an organisation of education puts into use so as to achieve its mission. Institutions which are called schools are the professional institutions. Therefore, each process should progress professionally in all its components when we adopt the approach of system. If we can make sense of the word professionalism, it means that we catch quality." L: 7

The lecturers' views on the order of priority in school quality assurance applications are shown in Table 4.

Table 4: Codes for Theme Two according to the Lecturers' Views

School quality assurance applications- order of priority										
	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
Self-evaluation	1	1	1	1	1	1	1	1	1	1
External evaluation	2	2	2	-	-	2	2	2	2	2
National stake holders survey	-	3	3	-	-	-	-	-	-	-
National test results	3	-	4	-	-	3	3	3	-	3
International test results	4	4	-	-	-	4	4	-	-	4

It is clear from Table 4 that all of the participants give more priority to self-evaluation than to external evaluation. Two participants gave the third priority to national stake holders surveys while five participants gave it to national test results. The fourth priority was given to national test results by one participant while it was given to international test results by five participants. Some of the examples for participant views are as in the following:

"Self-evaluation is very important. there should also be external evaluation. The existing situation should be observed and evaluated externally. Areas of blindness can occur in individuals.... I think that tests given on national scale are important in identifying quality but I don't think they are functional. They only intend to measure the cognitive dimension. They miss affective and psychomotor dimensions. I think, on the other hand, that international tests such as PISA and TIMSS make more multidimensional evaluations. I also consider national stake holders surveys important." L: 2

"I put schools' self-evaluation at the top. I believe that an external observation will be superficial. Applications such as training in coaching can be external. I do not think that evaluations made externally will be effective because the data to be collected by an outsider will not be of good quality, because feedback to be given will not be of good quality and because the criteria to be considered will not measure the teaching quality." L: 4

Table 5 below shows the lecturers' views on the stake holders of self-evaluation.

Table 5: Codes for Theme Three according to the Lecturers' Views

Stake holders of self-evaluation	
School administrators	L1- L2- L3- L4- L5- L6- L7- L8- L9- L10
Teachers	L1- L2- L3- L4- L5- L6- L7- L8- L9- L10
Students	L1- L2- L3- L4- L5- L6- L7- L8- L9- L10
Parents	L1- L2- L3- L5- L6- L7- L8- L9- L10
Support staff	L1- L2- L3- L5- L6- L7- L8- L9- L10
Graduates	L2
Neighbouring public institutions	L2
Non-governmental organisations	L5- L6
Society	L5

According to Table 5, all the participants said that school administrators, teachers and students constituted the stake holders of self-evaluation. Several participants thought that parents and support staff should be included in the process of self-evaluation. It was also pointed out that graduates, neighbouring public institutions and non-governmental organisations can also take on roles in the process of self-evaluation. Some examples for the participants' views in this respect are as in the following:

"School administrators, teachers, parents, students and support staff should be included in the process. On the other hand, neighbouring institutions and individuals in the neighbourhood can also state their thoughts on how they see our school through surveys." L: 2

"They can be performed by educational managers. All the stake holders of school can join. The necessary training should be offered. It should be guaranteed to teachers in particular that it was a job-related process and that it should not be considered personal." L: 8

Table 6 shows the lecturers' views on the frequency of self-evaluation.

Table 6: Codes for Theme Three according to the Lecturers' Views

The frequency of self-evaluation	Once a month (L1)
	Every day with teachers (L2)
	Once a month with school administrators, teachers, students and representatives (L2)
	Twice an academic year (L2)
	Four times a year including holidays (L3)
	Process evaluation (L4) (L6) (L7) (L9)
	Once a week with teaching staff (L4)
	Once a year (L5) (L8) (L10)

Accordingly, it was stated by the participants that self-evaluation could be made in the form of process evaluation. An example for the participants' views is as in the following:

"It is not an ending process. It is continuous. Therefore, internal supervision action plans should be prepared in following up the process. Both procedural and traditional actions should be taken." L: 6

It was also stated that self-evaluation could be made once or twice an academic year. On the other hand, it was also argued that teachers could participate in the self-evaluation process more frequently. An example for Participants' views is as in the following:

"Self-evaluation is a part of process evaluation. process evaluation is made everyday institutionally. It may be reported occasionally. We evaluate the process, we do not look at the results here. Stake holders can sometimes gather and interpret the data. It may be done every two weeks. It depends on learning output and the domain." L: 4

The lecturers' views on self-evaluation measurement and evaluation instruments are shown in Table 7.

Table 7: Codes for Theme Three according to the Lecturers' Views

Self-evaluation measurement and evaluation instruments	Surveys (L1) (L2) (L6) (L9)
	Interviews (L1) (L2) (L3) (L5) (L7) (L8) (L9) (L10)
	Student products (L4)
	Organisations (L1) (L5)
	Observations (L1) (L2) (L3) (L4) (L5) (L6) (L7) (L8) (L9) (L10)

As apparent from Table 7, the participants said that observations and interviews might be included more often in the process of self-evaluation as instruments of measurement and evaluation. An example for participants' views in as in the following:

"We should demand sincere things instead of surveys. We can also make evaluations in the form of a dinner activity. A week should be devoted to it. we can collect the data through interviews." L: 5

It was claimed that surveys could also be used in the process. An example for participants' views was as in the following:

"The data should be collected through various channels. Surveys or interviews are not adequate on their own. Some people are more comfortable during interviews while others are more comfortable during surveys." L: 9

It was also stated that measurement and evaluation could be made with students' products in the process of self-evaluation. An example for participants' views in this respect is as in the following:

"The primary data could be collected through students' products. The things produced by students are the data. The process should be observed." L: 4

Organisations could also be used as the source of data in the process of self-evaluation. The lecturers' views on the requirements of self-evaluation are shown in Table 8.

Table 8: Codes for Theme Three according to the Lecturers' Views

Requirements of self-evaluation	It should not be accusive or in search of errors (L2)
	The officials in provincial directorate of national education or in district directorate of national education should offer guidance in the process of self-evaluation (L3)
	People should not pretend (L3) (L5) (L6) (L8) (L9)
	Stake holders should be shown the benefits of the process (L3) (L8)
	Stake holders should be encouraged to participate (L1) (L2) (L3) (L4) (L5) (L6) (L7) (L8) (L9) (L10)
	Stake holders should internalise it (L3) (L4) (L5) (L6) (L7) (L8) (L10)
	Stake holders should participate in training on making self-evaluation (L8)
	Process evaluation (L4) (L6) (L7) (L9)
	A culture of self-evaluation should be created (L4) (L6)
	Reflective learning environments should be created (L4) (L7)
	Both procedural and traditional actions should be taken (L6)
	Reporting should not be considered as a work load (L6)
	Schools should develop their own models of perfection (L5) (L6)
	Sincerity should be available (L5) (L7)
	Objectivity should be secured (L8) (L9)
	Making use of multiple data collection sources (L9)

As clear from Table 8, it is considered important for stake holders to participate in and to internalise the process of self-evaluation. An example for participants' views is as in the following:

"The process should not be considered as forced labour. People should not pretend to do. The stake holders should be shown the benefits of the process and thus they should be helped to internalise the process." L: 3

Besides, culture of self-evaluation and environments of reflective learning were also emphasised. It was also stated that regulations might be made so that reporting would be considered as a work load. As illustrative of this, participant said:

“Reporting should not be considered as a work load. It should be made as a value of the institution. Individuals should internalise the process as a part of school culture.” L: 6 Table 9 shows the lecturers’ views on the stake holders of external evaluation.

Table 9: Codes for Theme Four according to the Lecturers’ Views

Stake holders of external evaluation	
Independent external institutions	L4- L6- L8- L9
Educational supervisors	L1- L2- L3
School managers	L1- L2- L3- L4- L5- L6- L7- L8- L9- L10
Teachers	L1- L2- L3- L4- L5- L6- L7- L8- L9- L10
Students	L1- L2- L3- L4- L5- L6- L7- L8- L9- L10
Parents	L1- L2- L3- L5- L6- L7- L8- L9- L10
Support staff	L1- L2- L3- L5- L6- L7- L8- L9- L10
Graduates	L3
Academicians	L3- L6
Non-governmental organisations	L2- L3- L5- L7
Other school managers	L2- L3
Mentors in provincial/district directorates of national education	L5
Society	L5

As clear from Table 9, all of the participants argued that school managers, teachers and students should be available in the process of external evaluation. Apart from that, 9 Participants also stated that parents and support staff beside the above-mentioned stake holders should be included in the process. The participants also argued that external evaluation could be made by external institutions, by educational supervisors and by the mentors in provincial/district directorates of national education. Illustrative of this, a participant said:

“External evaluation should be carried over by independent autonomous institutions and accreditation should be made by them. The independent institutions can be formed with the participation of experts, academicians and research assistants. Those individuals should be guided for such a mission. The data collected should be shared with schools and guidance should be given in creating school perfection models.” L: 6

It was also stated by the participants that graduates, academicians, non-governmental organisations and other school managers could take on roles in the process. A statement made in relation to this by a participant was as in the following:

“The process should be managed by supervisors. Additionally, parents, non-governmental organisations nearby, students, school managers and teachers can also take part in the process. Other school managers can also be consulted in sharing good applications and in solving certain problems after our school is made transparent. Graduates can also participate in the process as stake holders. Graduates can occasionally meet and their opinions and requests can be obtained through those meetings. Cooperation can be made with universities. Support can also be received from academicians.” L: 3

The lecturers’ views on how often external evaluation should be made are shown in Table 10.

Table 10: Codes for Theme Four according to the Lecturers’ Views

The frequency of external evaluation	When needed (L1) (L3) (L4) (L7) (L8) (L9)
	Twice a year (L2) (L3)
	Once a year (L5)
	Every three years (L6) (L10)

It is clear from Table 10 that six participants think external evaluation can be made when needed. Some of the examples for participants’ views are as in the following:

“School external evaluation should last for 15-20 days and it should be made whenever it is needed.” L: 1

“Schools can be supervised when needed. There should not standard time for it.” L: 3

It was also argued that it can be made once or twice a year. A participant's statement representative of this view was as in the following:

"School external evaluations can be made twice a year when considered from the aspect of supervisors." L: 2

On the other hand, it was also argued that such evaluations could be made every three years. The lecturers' views on external evaluation measurement and evaluation instruments are shown in Table 11.

Table 11: Codes for Theme Four according to the Lecturers' Views

External evaluation measurement and evaluation instruments	Lesson videos (L1)
	Diaries (L1)
	Surveys (L1) (L2) (L3) (L4) (L6)
	Interviews (L1) (L2) (L3) (L4) (L5) (L6) (L10)
	Graduate meetings (L3)
	Observations (L1) (L2) (L3) (L4) (L5) (L6) (L7) (L8) (L9) (L10)

Accordingly, all the participants said that observations could be used as an instrument of measurement and evaluation in external evaluation. In addition to that, it was also stated that interviews and surveys could also be used. Thus, a participant said:

"While surveys can be given to stake holders, focal group interviews and individual interviews can be made with parents and students- who have more ties with the school." L: 2

Lesson videos, diaries and graduate meetings were also mentioned as instruments which could be used in external evaluation. An example for participants' views was as in the following:

"Views and requests can be obtained by holding graduate meetings occasionally." L: 3

Table 12 shows the lecturers' views on the requirements for external evaluation.

Table 12: Codes for Theme Four according to the Lecturers' Views

Requirements for external evaluation	It should not make judgement (L2)
	School supervisors (L2) (L3)
	School mentors (L5)
	Specialised evaluators (L4) (L6) (L8) (L9) (L10)
	Professional process (L4) (L6) (L7) (L8) (L9) (L10)
	Accreditation (L6)
	Cooperation with universities (L3)
	There should not be evaluation by giving marks (L3)
	It should not be for a short time (L1) (L2) (L3)
	Guiding (L3) (L5) (L6) (L8)
	It can be shaped according to teachers' needs (L1)
	Appointing measurement and evaluation experts (L2) (L5)
	Evaluation directed to development (L3)
	Multi-vocal structure (L7)
	Objectivity (L9)
	Evaluation criteria (L9) (L10)

According to Table 12, participants stated that external evaluation could be made by specialised evaluators in a professional process. They also recommended that school supervisors should be employed in the process. An example for participants' views was as in the following:

"I consider school supervisors important. How many teachers and school managers a supervisor can reach can be found and those supervisors can be in contact with them as people responsible from a school. In the same way, measurement and evaluation experts can be assigned to a certain number of schools. They can analyse the collected data." L: 2

Participants also said that external evaluation should not be for a short time and that guidance should be considered important. It was also stressed that the process of external evaluation should not make judgement, it should not evaluate by giving marks and that it should be multi-vocal and directed to development. The lecturers' views on national stake holder surveys are shown in Table 13.

Table 13: Codes for Theme Five according to the Lecturers' Views

National stake holder surveys			
They should be included	Reasons	They should not be included	Reasons
L2 - L3 L8- L10	Comparisons can be made (L2) It contributes to determining policies (L2) It informs us of the educational-instructional process of the ministry (L3)	L1- L4- L5- L6- L7- L8- L9	Each school is different from another (L1) Stake holder surveys at the scale of provinces/districts (L1) Data should be collected through qualitative instruments (L4) Sincere responses (L5) (L7) Additional bureaucracy (L6)

While four participants said that national stake holder surveys could be included in quality assurance models, six participants said that they should not be included in the models. They claimed that national stake holder surveys could be made due to the fact that they enabled comparisons and that they could be used as data in the policy determination process. A participant stated their opinion in this respect as in the following:

"Schools and school zones can compare themselves with others through national stake holder surveys. Besides, the results of such surveys can also be used in determining policies." L: 2

However, the participants also stated that those surveys might cause additional bureaucracy, lead to insincere responses and therefore they should not be used in every school and that they should not be included in quality assurance models. A participant's statement representative of the view was as in the following:

"Stake holder surveys at the scale of the provinces or districts could be made instead of national surveys. There are approximately 60,000 schools in our country. Each school is different from another school." L: 1

The participants' views on the results of national tests are shown in Table 14.

Table 14: Codes for Theme Six according to the Lecturers' Views

Results of national tests			
They should be included	Reasons	They should not be included	Reasons
L1- L3 L6- L7 L8- L10	Determining the quality of education and instruction (L1) Indicator (L3) Multiple evaluation (L7) Power tests (L7)	L2- L5 L6- L9	They do not demonstrate quality (L2) Unreliable (L5)

Accordingly, six participants held the view that the results of national tests should be included in quality assurance models because they might be indicators in revealing the quality of education. In this respect, a participant said:

"Nationally given tests should be available in this model. They are significant indicators. But, we should not focus only on the results of the tests." L: 3

"It cannot be said that the results of the tests should not be taken into consideration. There should be multiple evaluation. It is not in the centre, either. You cannot give speed test to individuals in constructivist approach. You can give power test. You should make students solve problems instead of making them do tests." L: 7

Four participants, on the other hand, emphasised that the results of those tests should not be included in quality assurance models since they would not demonstrate the quality of a school and since they were not reliable. A participant stated their view as:

“Tests given at the national scale do not indicate quality. School managers are compared on the basis of how many students won good quality schools in LGS (high school entrance exam).” L: 2

The lecturers' views on the results of international tests are shown in Table 15.

Table 15: Codes for Theme Seven according to the Lecturers' Views

Results of international tests			
They should be included	Reasons	They should not be included	Reasons
L1- L2	Comparisons can be made. (L2)	L3- L4- L5- L8	All schools do not join (L3)
L6- L7	They force to work hard (L2)	L9	
L10			

It is apparent on examining Table 15 that five participants believe that the results of international tests should be included in quality assurance models because they enable comparisons and because they trigger hard work. A participant said in this respect:

“The results of international tests should be included. The results force us to work hard. We make efforts to make the teaching-learning process more appropriate.” L: 2

Five other participants, however, stated that the test results should not be included in quality assurance models because some of the schools did not participate in those tests. A participant's statement illustrative of the view was as in the following:

“International tests should not be included. Not all of the schools join such tests. The results should not be included for unity in education. They should not be included because samples could not be taken from all schools.” L: 3

The lecturers' views on sharing the evaluation reports are shown in Table 16.

Table 16: Codes for Theme Eight according to the Lecturers' Views

Sharing the evaluation reports			
Stake holders who participate in the evaluation	Reasons	Stake holders and society	Reasons
L8	Negative competition (L8)	L1- L2	It is a requirement for being open school. (L2)
	Negative school image (L8)	L3- L4	There should be transparency (L3)
		L5- L6	(L4) (L7) (L9)
		L7- L9	Accountability (L4) (L9)
		L10	Guidance to students who wish to enter the school (L4)
			They should be open to the public (L6)
			Constructive criticism (L9)

Accordingly, a participant stated that the reports prepared as a result of evaluations should only be shared with stake holders who took part in the evaluation because the reports could cause negative competition and because they could have negative effects on the school image. A view stated in this respect was as in the following:

“Accusing language should not be used in evaluation reports. In my opinion, they are not so necessary. Negative competition can arise; the school image can be deteriorated.” L: 8

On the other hand, the participants also argued that the results of the evaluation reports could be shared with the society beside the stake holders who took part in the evaluation so that transparency and accountability could be attained as a requirement for being an open school. The view was stated as in the following by a participant:

“Self-evaluation and external evaluation reports should be shared with all the stake holders and with the society. It is a requirement for being an open school. Stake holders should be informed of the results. In fact, the quality of a school is revealed in this way. Why should high quality schools and schools which achieve success abstain from sharing the results?” L: 2

It was also pointed out by the participants that sharing the reports of evaluation results with everybody would guide students who would like to enter the school. A statement representative of the view was as in the following:

“Transparency and accountability are the main principles. The results can, of course, be shared with the society on the condition that the limits are determined by school administration, students and teachers. The students who would prefer to attend that school will need such information.” L: 4

The lecturers' views on rewarding and certification are shown in Table 17.

Table 17: Codes for Theme Nine according to the Lecturers' Views

Rewarding and certification			
There should be	Reasons	There should not be	Reasons
L1- L2 L3- L4 L6- L8 L9- L10	A motivating power (L1) (L2) (L3) (L4) (L6) A driving force (L8) It should be objective (L8) It should influence emotions (L9)	L5- L7	There should be internal motivation (L5)

It is clear from Table 17 that there are eight participants who think that there should be rewarding and certification according to the results of evaluations. They consider rewarding and certification as motivating and as a driving force and say that the rewards and certificates given should be objective and should appeal to emotions. A view in this respect was stated as:

“There should be rewarding. Rewards should be useful. They should influence receivers' motivation. They activate those individuals' feelings; they affect the individuals. They should, for instance, be given by parents. But they should not be like the ones given on teachers' day. They should be representative rewards but the person who receives them should feel honoured.” L: 9

Two participants stressed the need for internal motivation and said that there should be rewarding and certification. A participant stated their view as:

“In my opinion, rewards and certificates are perfunctory. If I have a target, I am already rewarded. So I do not feel the need for a reward. The situation turns into wrong incentive. If we transform the situation into internal motivation, we do not need an external reward.” L: 5

3.3 Conclusions and Discussion

It may be recommended in the light of the results obtained that external evaluation should be made for self-evaluation and that national beside international tests should be used as data for school quality assurance applications. Boards of self-evaluation could be formed in schools and school administrators, representatives of parent-teacher associations, students, parents, support staff and even the representatives of non-governmental organisations could be included in those boards. Self-evaluation can be made at least once in an academic year. The data can be collected in the process through classroom observations, students' products, surveys to be given to parents and students and through interviews with the members of parent-teacher associations, with teachers and support staff. Evaluation reports can be prepared by analysing the collected qualitative and quantitative data. School development plans can be prepared according to those reports. School self-evaluation boards can be held responsible for preparing, implementing and evaluating the school development plans.

The process can be managed by stake holders available in the team of school self-evaluation by means of educational supervisors. The process of external evaluation can be shaped according to the frequency of school development plans. The data can be collected through classroom observations, students' products, surveys to be given to parents and students and through interviews with school administrators, members of parent-teacher associations, teachers and support staff in external evaluation- as in the case of self-evaluation. the reports prepared on the basis of external evaluation and school development plans can be broadcast on the web pages of schools. Besides, schools with exemplary applications can also be rewarded.

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Examination of the Concept Images of Pre-service Teachers for Single-Variable and Multi-Variable

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Abstract

This study aims to examine the concept images of pre-service mathematics teachers for the concepts of single-variable and multivariable functions. In the present research, which was conducted with the case study method, a test consisting of three open-ended questions was used to obtain data about the definition of the concept of function and the concept images of the single and multivariate functions of the pre-service teachers. The data obtained were coded with the descriptive analysis method and analyzed qualitatively. Each coding was given as a theme with frequency and percentage values and the answers given by the pre-service teachers were presented as examples. The findings obtained in this study showed that the pre-service teachers' concept images about function consisted of different representations of the concept of a function and concept images were generally classified as matching, transformation and equation. The pre-service teachers' concept images of the concept of function also had incomplete learning and misconceptions. That definition and value sets, which are important components of the concept of function, were not included in the answers. The pre-service teachers defined the functions as $f(x)$ in multivariate function examples, and they ignored that x represents the only variable in the function. In addition, pre-service teachers who had misconceptions in single-variable function examples (equation and algebraic expression) made the same mistake in multivariable functions and could not make a correct representation although they used two variables in their expressions. It was determined that misinformation and misconceptions in concept images for multivariable functions were caused by incomplete information and mislearning in the function definition and single-variable function examples. The findings suggest that supporting the course designs on single and multivariable functions with examples and concept knowledge would be beneficial for an effective learning process.

Keywords: Concept Image, Single Variable Function, Multivariable Function

1. Introduction

Mathematical concepts are interrelated like links in a chain. Failure to establish a relationship between these concepts during mathematics teaching makes learning mathematical concepts challenging and causes students to develop a negative attitude toward mathematics. Therefore, effective learning of mathematical concepts is significant for both effective mathematics teaching and the development of positive attitudes toward mathematics. There are different theories about the process of understanding and learning concepts, one of which is the theory of concept definition and concept image, founded by Tall and Vinner (1981). In general terms, concept definition is the words and contents used to distinguish a concept from others. Concept image is all the content and

associations that exist in the individual's mind regarding that concept. Vinner (1983) states that the existence of a concept in an individual's mind consists of two different cells: concept definition and a concept image. These cells are seen as mental structures that become active in actions related to the concept in question.

The mental image of a concept consists of visual representations, such as symbols, graphics, shapes, mental pictures and thoughts that appear in the person's mind in relation to that concept. All these mental thoughts and representations in the individual's mind regarding the concept constitute the concept image. Therefore, concept image is a phenomenon that can vary from person to person. Individuals have concept images that are right, wrong, incomplete or contradictory, which are specially created according to their own experience and thinking. Thus, concept image has an informal structure that has the potential to reflect the misconceptions and wrong views of the person toward that concept and the concept image of the person does not have to be compatible with the formal definition of the concept as it is personal (Rösken & Rolka, 2007). Concept definition, on the other hand, is expressed as a scientifically accepted definition. In other words, the formal definition represents the concept definition.

In light of the studies on concept images and concept definitions, it has been determined that students tend to use the concept of image instead of using concept definitions. Although there are concept definitions and concept images of some concepts in mind, these two may not always coexist for every concept; because, for some concepts, there is only the concept image in mind and there is no concept definition. In other words, while students are solving a problem, they can establish an interaction between these two and use only concept definition or concept image (Vinner, 2002). For example, a student can use only the concept image for the function without the need for a formal definition of the function. In such cases, there is no need for a formal definition of the concept, as the concepts are expressed based on the concept images acquired in the past years (Tall & Vinner, 1981).

When it comes to effective learning, meaningful interaction between concept definition and concept image is a prerequisite. The interaction between concept image and concept definition can occur in two different ways (Vinner, 1983). (i) In the first case, when a student is introduced to the concept, he/she first creates a mental image, and then the teacher gives the definition for the concept. After that, there are three different situations. In the first, the student assimilates the concept definition given by the teacher and changes the initial concept image. In the second, the student keeps his/her own concept image, changes the definition given by the teacher, and creates a mental definition that resembles his/her own concept image. In the third, the concept definition and concept image of the student remains the same. When the student is asked a question about the concept, he/she tells the concept definition as he/she learned from the teacher but continues to use the concept image he/she has in other cases. (ii) In the second case, unlike in the first case, the student has not encountered the concept before. That is, the concept image cell is empty. In this case, the concept image begins to take shape according to the concept definition.

Apart from the interaction process between concept definition and concept image, there are three different uses of these two during a cognitive activity (Vinner, 1983). In the first, the student uses the concept definition more than his own concept image in the cognitive activity process. In the second, the student focuses only on the concept definition. In the third, the student uses only the concept image. However, in teaching processes, it is stated that the situations where only concept image is used are the most common. Considering this situation, it is seen that concept image has a more active role in the concept teaching process rather than concept definition. In this case, it can be stated that students benefit from concept images more frequently in mathematical operations and learning processes.

It is seen that many different studies have been conducted on Tall and Vinner's (1981) concept definition and concept image model (Ergün, 2010; Fujita, 2012; Fujita & Jones, 2007; Macit & Nacar, 2019; Monaghan, 2000; Nakahara, 1995; Vinner, 1983; Ward, 2004; Wilson, 1990). Among the studies examined, it has been observed that there are studies on different subjects, such as trigonometric functions, rational numbers, and geometric objects, for mathematics education.

It has been taken into account that secondary school mathematics teacher candidates encountered the concept of multivariate function for the first time at the university level. In the literature review, no concept image studies were found for multivariate functions. In addition, it was thought that only one-variable functions were not

sufficient in the formation of pre-service mathematics teachers' concept images about function. Therefore, in this study, both univariate functions and multivariate functions are focused because learning multivariate functions is associated with univariate functions (Yerushalmy, 1997). To learn multivariable functions, besides basic function knowledge, the properties of univariate functions should be adapted to multivariate functions. Thus, learning multivariate functions can be expressed as challenging for most students. In addition, spatial thinking and visualization skills are required for the transition from univariate functions to multivariate functions. Therefore, geometric interpretation of multivariable functions may not be quick and easy for some of the students. The analysis course, one of the mathematics education courses at the university level, has a structure based on the subject of functions. The subject of univariate functions and multivariate functions is also included in different departments of universities related to mathematics. Most of the students studying in these departments are faced with multivariate functions for the first time. In general, multivariable functions are also the basis for many different areas of mathematics. Hence, the challenges that may be encountered in the learning process of multivariate functions will negatively affect the learning of other concepts related to this concept. This study aims to examine the pre-service teachers' concept images regarding the concepts of univariate function and multivariate function at the university level. According to the findings and results obtained from this study, suggestions will be presented to facilitate the transition from univariate functions to multivariate functions. And also, examining the concept images of the students about the single and multivariate functions can be useful in the planning of the teaching content and activities.

According to these purposes, the sub-problems of the research are as follows:

- 1- What are the concept images of secondary school mathematics teacher candidates regarding the concept of function?
- 2- What are the concept images of the secondary school mathematics teacher candidates on the example of a single variable function?
- 3- What are the concept images of the secondary school mathematics teacher candidates on the example of a multivariate function?

2. Method

2.1 Research Design

Qualitative research method, which aims to determine the concept images of pre-service mathematics teachers on single and multivariate functions, and a descriptive survey model were used in this research. The main purpose of the descriptive survey model is to accurately observe and describe a situation and its characteristics. In the field of education, it is used to learn the affective and cognitive characteristics of people (Johnson & Christensen, 2014). In this study, the descriptive survey model was used as the concept images of pre-service teachers about single and multivariate functions were examined. Concept images of pre-service secondary school mathematics teachers were expressed with descriptive statistics.

2.2 Participant (Subject) Characteristics

The study group of this research consisted of pre-service secondary school mathematics teachers. Pre-service teachers participated in the present study voluntarily. Easily accessible case sampling, one of the purposeful sampling methods, was used. This sampling method adds speed and practicality to the research. In this method, the researcher chooses a situation that is close and easy to access (Yıldırım & Şimşek, 2011). This study was conducted with 37 secondary school mathematics teacher candidates. All of the candidates had taken the analysis 1 course, which included the concept of function. In the selection of the sample, no elimination was made from the pre-service teachers in the class and all the pre-service teachers in the class were included in the scope of this study, but the pre-service teachers who were not present when the test was applied were not included in the scope of this study.

2.3 Data Collection Tools

The data of the study were obtained with a test consisting of open-ended items. A test consisting of three open-ended questions was prepared by the researcher to obtain data on the definition of the pre-service teachers' concept of a function and their concept images for single and multivariate function examples. In this test, firstly, the definition of function concept, secondly, univariate function concept and its example, and thirdly, multivariate function concept and its example were asked. For the content validity of this test, the relevant literature and the opinion of an expert in mathematics education were deemed sufficient. In applying the test, first of all, pre-service teachers were informed about this study, and they were explained to write concept definitions and explain the concept examples in detail. Then, to determine the concept images of the pre-service teachers about their functions and sub-concepts, a test consisting of three open-ended questions was applied to them in 30 minutes after the lesson.

2.4 Data Analysis

The data obtained from the test consisting of open-ended questions were examined in three stages: understanding, planning and evaluation. The concept images of the pre-service teachers were examined at each stage.

As a result of the literature review and reading of the data by the researcher, a coding for the data was created. Each word, sentence and examples were coded accordingly. Then thematic coding was performed. The codes related to each other were brought together to reach the themes. The study performed at this stage is the content analysis study. Content analysis is the classification of verbal and written data in terms of a specific problem or purpose and categorizing them to extract a specific meaning from them (Tavşancıl & Aslan, 2001). The data obtained from the test were coded and analyzed qualitatively. The coding process was carried out together with the researcher and a mathematics education specialist. The data obtained from the present study were coded by two researchers working independently from each other. The number of "consensus" and "disagreement" situations was determined for the coding made. According to Miles and Huberman (1994) coding reliability formula, it was calculated as 96%. Each coding is presented in themes with frequency and percentage values. Concept images and examples of pre-service teachers' functions and sub-concepts were analyzed and interpreted descriptively.

The main purpose of this research is to present a descriptive and realistic picture of the researched subject. Since the purpose of generalization is not carried out, the findings are limited only to the pre-service teachers who participated in this research. In qualitative research, the validity and reliability of the findings are ensured by presenting the data obtained as detailed and directly as possible (Yıldırım & Şimşek, 1999). Given this situation, quotations from the answers of the pre-service teachers were also included.

2.5 Statements of Publication Ethics

This research was reviewed by the Izmir Demokrasi University Social and Humanities Ethics Committee, and it was decided that the research was ethically appropriate. Date and ethical approval decision number for this study: 08/04/2022- 2022/04-04

3. Results

In this study, in which the pre-service teachers' concept images for univariate and multivariate functions were examined, first of all, the pre-service teachers' concept images for the function were examined. The data obtained are presented in Table 1.

Table 1: Function Concept Images of Pre-service Teachers

Themes for the Concept of Function	f	%
Input-output (machine, conversion)	14	37.8
Matching	13	35.1
Equation	4	10.8

A type of transaction	1	2.7
Graphic representation	1	2.7
Rule	1	2.7
Blank response	3	8.1

When Table 1 is examined, it is seen that the pre-service teachers' concept images about the function consist of input-output (machine, transformation), matching, equation, a type of operation, graphical representation and rule expressions, respectively. The concept images of the pre-service teachers were mostly gathered under the themes of input-output and matching, and three pre-service teachers did not answer this question. Although the pre-service teachers do not include the details of the domain and image set of the functions, it can be said that they mostly gave the matching and input-output answers based on these contents. Only one pre-service teacher preferred to express it according to the way of representation by drawing graphics instead of defining the function. The concept images of the pre-service teachers regarding the univariate function examples are examined in Table 2.

Table 2: Concept images of pre-service teacher for the example of a univariate function

Themes for the Univariate Function Example	Examples of functions with one variable	f	%
Examples of equations based on y and f(x) notation	$f(x)=2x+3$ $y=2x+12$ $y=x+9$ $4t^2 + 3t-2=y$ (a different variable instead of x) $f(x)=x+3$ $f(x)=2x+x^2+3$ (quadratic function) $f(x)=7x+3$ $f(x)=5x+6$ $f(x)=2x+2$ $f(x)=x+5$ $f(x)=2x+9$ $f(x)=3x+5$ $f(x)=x+8$ $f(x)=7x+5$ $f(x)=2x+7$	15	40.5
Examples of algebraic expressions	$ax+b$, x^2-12x $5x+7$ ax $2x$ $5x+2$ $3x+5$ $4x+5$ $x+5$ $3x$	10	27.02
Examples of equations	$3x+2=6$ $2x=5$ $x+3=5$ $2x+1=3$ $3x+2=5$	8	21.6

	$ax+b=c$ $3x+5=8$ $x=1$		
Multivariate expression	$2x+4y=6$	1	2.7
Verbal expression	A function is to show results by sticking to a single value in a graph.	1	2.7
Blank response		2	5.4

When Table 2 was examined, it was seen that pre-service teachers mostly gave equality examples based on $f(x)$ and y notation as univariate function examples. Ten pre-service teachers wrote algebraic expressions as examples of univariate functions. In this case, it can be thought that giving an example of a function with an algebraic expression without depending on $f(x)$ is a result of incomplete or wrong learning. While expressing the concept of univariate function, eight pre-service teachers used equation examples. One pre-service teacher gave an example of a multivariate function, one pre-service teacher preferred verbal expression, and two pre-service teachers did not respond. When the examples given in general were examined, it was seen that while the majority of the pre-service teachers used the letter x as variable/unknown, only one pre-service teacher used the letter t . In addition, most of the examples given were linear functions/equations, and only one pre-service teacher gave an example of a quadratic function. While it is possible to express the concept of function with different representations, such as graphs, set diagrams, tables and words, most pre-service teachers used algebraic representation in sample selection.

Concept images of pre-service teachers regarding multivariate function examples are examined in Table 3.

Table 3: Concept images of pre-service teachers for examples of multivariate functions

Themes for Multivariable Function Example	Examples of Multivariable Functions	f	%
Examples of equations based on the y or $g(x)$ notation	$4t^2+3k=y$ $g(x)=5x+4y+2$ $g(x)=4x^5+3x^4+7x^3+11x+20$ $2x+12=y$ $x+5=y$ $y=x^2+3$ $g(x)=x+y+3$ $g(x)=2x+3y+z$ $f(x)=4a+3b$ $fgx)=3x^2+2x+4$ $g(x)=2x+3y+xy$ $g(x)=x^2+4x-4$ $f(x)=2x+3y+5$ $h(x)=3x^2+5y$ $f(x)=2x+3y+4$	15	40.5
Examples of algebraic expressions	$ax+by+c$ y^2-6x $8x+5y+10$ $10x-7y+9$ $3x+4y$ $2x^2+4y+1$ $2x+y$ $3x+5y$ $2x+3y$	9	27.02

Examples of equations	$2x+3y=8$ $x.y=9$ $x+2y=13$ $2x+5y=47$ $x^2+1=2$ ($x=-1$) $2x+4x=0$ $x^2+y^3=27$ $4x-5-3y=0$ $ax+by+cz=0$	9	27.02
Multivariable function	$f(x,y)=2x+3y+8$	1	2.7
Verbal expression	Displaying different kinds of values in a chart	1	2.7
Blank response		2	5.4

When the pre-service teachers examined the concept images of the multivariate function examples in Table 3, it was observed that some basic concepts about the function were not sufficiently known. For example, some pre-service teachers defined the variable notation of the multivariate function as x only, as in the example $g(x)=5x+4y+2$. Afterwards, they expressed the multivariate function with $f(x)$, $g(x)$ or $h(x)$, but in the continuation of the equation, they wrote two different variables (expressions containing x and y). This shows that they have misconceptions not only about the multivariate function but also about the way the function is expressed. Another missing information that pre-service teachers have about the function is the definition and value sets of the function because pre-service teachers did not specify definitions and value sets for both univariate and multivariate functions. Although the pre-service teachers generally used the variables x and y in the examples of multivariate functions, they used incorrect expressions as a form of representation. Although he did not specify the definition and value set, only one student gave a correct example with the notation $f(x,y)=2x+3y+8$. In that case, it is possible to say that pre-service teachers have incomplete knowledge not only about multivariate functions but also about the concept of function in general. The findings suggest that teaching the subject of multivariate functions directly, without completing these deficiencies about the basic meaning of the function, can continue the incomplete information and misconceptions.

4. Discussion

The data obtained in this research, in which the concept images of the pre-service teachers for the concept of a function and the examples of single and multivariate functions were examined, it was determined that first of all, the concept images of the pre-service teachers for the function consisted of different features/aspects of the concept of function. Function concept images of pre-service teachers were generally under the themes of matching, transformation and equation. Carlson, Oehrtman and Thompson (2005) stated that students should be supported to distinguish between function and equation, regarding the mistake of perceiving function as an equation. As another finding in this study, a small number of pre-service teachers had the concept images of rules and procedures for the concept of function. According to these findings obtained from the first question of this research, the majority of pre-service teachers had incomplete/wrong learning in the basic definition of the concept of function. In addition, the concept images of some of the pre-service teachers matched the concept definition of the function. However, this image overlapped with only one of the multiple representations of the function and this image did not have such versatile content as the concept definition of the function. While it is possible to express the concept of function under various representations, such as graphics, cluster diagrams, tables, and verbal and algebraic representations, the majority of pre-service teachers used algebraic representation in function examples. According to the National Council of Teachers of Mathematics [NCTM] (1989) standards, students are expected to have the ability to represent functions with tables, graphs, equations and verbal expressions, to know the meanings of these representations and to make transitions between representations. In addition, Lobato and Bowers (2000) stated that it is important to use multiple representations and although students know how to transform between representations, students may not be able to explain and realize what, how and how they are represented.

In this regard, Christou, Elia and Gagatsis (2004) emphasize the necessity of alternative teaching approaches in teaching the use of multiple representations and transformation between representations.

The results obtained from the current research on the concept of function were also similar to other studies in the literature (Sierpinska, 1992; Vinner & Dreyfus, 1989). Also, in a similar study, it was stated that "Mistakes regarding the formal definition of the concept of function arise from students' describing the concept incompletely or incorrectly. For example, the function is only a match, a formula or an equation" (Kabael, 2010, p.). This view supported the results of the present study. Similarly, the inference in Mayes's (2001) study that students defined the function only as a rule or a formula was similar to the present study. In a different study on function concept images (Aydın & Köğçe, 2008), the findings showed that most of the pre-service teachers perceived functions as equations and that they were inadequate in defining function concepts. The findings of that study also overlapped with the results of the current research. In this case, it is possible to say that some concept images of the pre-service teachers regarding the concept of function take the meaning of the function in one direction and make the definition limited.

For the second sub-problem of the research, concept images of pre-service teachers for univariate functions were investigated. In their answers, pre-service teachers did not write anything about definition and value sets, which are important components of the concept of function; they wrote equations based on $f(x)$ or y notation. It has been determined that some of the pre-service teachers have an equation concept image related to the concept of function. Another result obtained from this research is that some pre-service teachers have the concept image of algebraic expressions related to the concept of function. According to these results, it is possible to say that the pre-service teachers have deficiencies and misconceptions in their basic knowledge of the concept of function, which is one of the main topics of the analysis course. The reason for this deficiency can be considered the fact that the function notations are written without conceptual knowledge and emphasizing the conceptual content in the questions, the concept definition is not emphasized enough in the teaching of the function concept, the function is not explained with multiple representations or the transition between representations is not emphasized enough. In short, it can be said that explaining the operational properties of the function more than the conceptual aspect of the function causes information deficiencies.

When the pre-service teachers' preferences for the letter and the degree of function in the univariate function examples were examined, only one pre-service teacher wrote an example of a quadratic function. Other pre-service teachers wrote linear functions to univariate function examples. In addition, it has been determined that the pre-service teachers' letter preferences are generally the letter x as a variable, and they mostly choose $f(x)$ notation as a notation. Therefore, it can be said that pre-service teachers' concept images are affected by different expressions, such as a variable letter, representation style and degree of function, which are more commonly used in questions. In other words, it can be stated that pre-service teachers' concept images are formed according to the common usage of a concept in books, questions or course content.

As the third sub-problem of this research, pre-service teachers' concept images of multivariate functions were investigated. Pre-service teachers defined function representations in multivariate function examples as $f(x)$ by heart and in a stereotyped way. They used the notation $f(x)$ for multivariate functions, ignoring that x represents the only variable in the function. When the data were examined, it was seen that the pre-service teachers did not use the $f(x,y)$ format, which is correct for multivariate functions, but rather used $g(x)$ and $h(x)$ notations. They preferred different letters instead of the commonly used $f(x)$ notation in multivariable function examples. For univariate functions, most of the pre-service teachers wrote the notation $f(x)$. In the case of multivariable functions, they thought that they were making a correct representation only by letter change, whereas their representation was not correct. In function representations, f , h , g only represent the function symbolically. The most important thing is to write one or more variables correctly in the function representation according to the number of variables in the function. In other words, the expected response from the pre-service teachers for the representation of bivariate functions was not $h(x)$, $f(x)$ or $g(x)$. They were expected to write $f(x,y)$ for bivariate functions. The reason for the letter preferences in the pre-service teachers' examples was that they knew that single and multivariate functions had different representations. However, they did not have the knowledge of notation to express this difference. They wanted to express this difference simply by changing the letter f in the notation $f(x)$. In general terms, the pre-service teachers did not have knowledge of the $f(x,y)$ form of the functions of two variables. In

addition, the pre-service teachers who misunderstood only equation and algebraic expressions as function expressions in univariate function examples also made the same mistake in bivariate function examples. Although they used two variables in their example, they could not write a correct notation. The pre-service teachers did not write the definition and value set in the multivariate function examples as well as in the univariate function examples. Pre-service teachers mostly preferred to use quadratic expressions in multivariate function examples, unlike univariate functions. We can say that pre-service teachers' concept images of multivariate functions are close to quadratic expressions. That is, they took into account the word "many" in the expression "multivariate function." But they did not increase the number of variables in the function according to the word multiple variables; they preferred to increase the degree of the function.

The subject of multivariate functions is taught at universities in departments related to mathematics, such as engineering, basic sciences, and mathematics teaching. Most of the students studying in these departments encounter this subject for the first time. In general, the subject of multivariate functions is an important subject for different fields of mathematics (e.g., analysis, complex analysis, functional analysis, geometry and algebra). The subject of univariate functions, which is the basis of multivariate functions, is also an important subject for many subjects and courses related to the science of mathematics. Therefore, pre-service teachers have learning deficiencies and misconceptions about multivariate functions and univariate functions may negatively affect the learning process of other mathematical concepts related to these concepts.

The main concept that this research aimed to examine was multivariate functions. However, while designing this research, it was desired to examine the concept images of the function definition and univariate function examples before examining the pre-service teachers' concept images of multivariate functions because it is aimed to draw a more holistic conclusion according to the information to be obtained and the incomplete learning and misconceptions to be determined. As predicted in the research design, the pre-service teachers' misconceptions and misconceptions in the concept images of the multivariate function stem from incomplete information and mislearning in the function definition and univariate function examples. Based on this information and data, although the concept of function, which is one of the main subjects of mathematics and some of its sub-branches, is crucial, there are incomplete learning and misconceptions about this concept, and learning this concept is difficult for students (Mayes, 2001). The results obtained in this study are similar to the literature given that, in this study, it has been determined that the incorrect concept images of the pre-service teachers in the research stem from previous incomplete or incorrect learning. Overcoming this difficulty seems to be possible with the existence of situations where concept image and concept definition overlap with each other.

Based on the research results, it should always be considered that mathematics is a course with holistic and progressive content. In other words, for a subject to be learned completely and correctly, there should be no learning deficiency and misconceptions about the previous subjects. In this respect, it can be suggested that lesson plans be made in a way that complements the missing learning and supports previous learning. To teach a concept in the literature, it is recommended to make many examples of that concept (Tall & Vinner, 1981). This recommendation should also be taken into account in this study. The findings suggest that teaching with a large number of examples of single and multivariate functions would be beneficial in terms of an effective learning process. In addition, as a result of this research, it was found that the letter preferences of the pre-service teachers in the function representations were generally the letter x and they mostly chose the $f(x)$ notation as the notation. In other words, the concept images of the pre-service teachers were formed according to the factors, such as letters, representation style and degree of function frequently used in the questions and various sources. In short, the common use and representations of the concept were effective in the concept images of the learners. In questions where the operational feature of the function concept comes to the fore, giving additional information about the concept definition of the function and emphasizing its definition enables learners to learn the concept of function more effectively. In this way, the concept images of the learners can become compatible with the concept definition. Thus, in questions that require procedural knowledge, conceptual information can be included as additional information or as a reminder, provided that there is no clue in solving the problem. This situation can contribute to the concept of images in individual's mind. Therefore, while preparing some questions, it may be suggested to include conceptual definitions in the question. In this way, the definitions that learners frequently encounter are useful for their concept images. In addition to this research result, it can be suggested that different studies should be conducted in larger research groups on concept image and conceptual and procedural knowledge.

This situation, together with the results of the current study, will contribute to the learning processes in terms of providing a holistic approach to the subject of functions.

Conflicts of interest

The author has not declared any conflicts of interests.

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