



Education Quarterly Reviews

Omar, A. M., Onen, D., & Etomaru, I. (2023). Nurturing Excellence: An Evaluation of the Higher Education Quality Assessment Model from the Perspective of Undergraduate Students in Somalia's Benadir Region. *Education Quarterly Reviews*, 6(4), 121-132.

ISSN 2621-5799

DOI: 10.31014/aior.1993.06.04.791

The online version of this article can be found at:
<https://www.asianinstituteofresearch.org/>

Published by:
The Asian Institute of Research

The *Education Quarterly Reviews* is an Open Access publication. It may be read, copied, and distributed free of charge according to the conditions of the Creative Commons Attribution 4.0 International license.

The Asian Institute of Research *Education Quarterly Reviews* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of education, linguistics, literature, educational theory, research, and methodologies, curriculum, elementary and secondary education, higher education, foreign language education, teaching and learning, teacher education, education of special groups, and other fields of study related to education. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Education Quarterly Reviews* aims to facilitate scholarly work on recent theoretical and practical aspects of education.



ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

Nurturing Excellence: An Evaluation of the Higher Education Quality Assessment Model from the Perspective of Undergraduate Students in Somalia's Benadir Region

Abukar Mukhtar Omar¹, David Onen², Irene Etomaru²

¹ Faculty of Education, SIMAD University, Mogadishu, Somalia

² East African School of Higher Education Studies and Development, College of Education and External Studies, Makerere University, Kampala, Uganda

Correspondence: Abukar Mukhtar Omar, Faculty of Education, SIMAD University, Mogadishu, Somalia. Tel: - +252615010660, E-mail: abukar@simad.edu.so

Abstract

This study validated the Higher Education Quality Assessment Model (HEQAM) within the undergraduate educational milieu of universities in the Benadir region of Somalia. Originating in 2013, the HEQAM model, introduced by Noaman et al., represents a notable progression in evaluating the quality of higher education. Despite its decade-long existence, the model's validity and reliability have remained largely unexplored, with a solitary prior validation study conducted at a university in Saudi Arabia in 2017. This research addressed this lacuna by critically scrutinising the applicability of Noaman et al.'s HEQAM tool in assessing the perceived quality of higher education among students in the Benadir region. Employing a quantitative approach and a cross-sectional survey research design, data were garnered from 1,803 undergraduate students through electronic questionnaires across diverse universities in the Benadir region. The study's outcomes affirm the robustness and consistency of all eight dimensions within the HEQAM model as efficacious measures for evaluating higher education quality. The findings underscore substantial positive correlations among the dimensions, underscoring their significant interconnectedness. Thus, this investigation asserts that Noaman et al.'s HEQAM instrument is a reliable and cohesive tool adaptable to diverse educational settings. The discernible correlations and alignment with traditional conceptions of educational quality substantiate the construct validity of the HEQAM model. In light of these findings, the validated HEQAM instrument is recommended for standardised adoption in assessing and enhancing educational quality across various institutional and programmatic contexts. Comprehensive data and nuanced recommendations are available in the complete report.

Keywords: Higher Education Quality, Quality Assessment, Validation, Undergraduate Students, Instrument

1. Introduction

1.1. The Research Problem

This study addressed the critical issue of ensuring the validity and reliability of research instruments, explicitly focusing on Noaman et al.'s Higher Education Quality Assessment Model (HEQAM) introduced in 2013 (Noaman et al., 2013). The problem was the limited exploration of the model's validity and reliability, with only one prior validation study conducted at King Abdulaziz University in Saudi Arabia in 2017. This singular validation raised concerns about the generalizability of the HEQAM model across diverse higher education institutions, especially regarding its applicability in the Benadir region of Somalia. The problem was of paramount importance as the HEQAM model holds the potential to revolutionise higher education quality assessment. However, its unexplored validity and reliability compromise its effectiveness and reliability in assessing the perceived quality of higher education in different contexts.

The study builds upon Noaman et al.'s prior work by extending the HEQAM model's validation to a new context, the Benadir region in Somalia. The primary objective is to scrutinise the suitability of the HEQAM tool in evaluating the perceived quality of higher education in this specific region, addressing the lack of validation studies beyond the initial one in Saudi Arabia. The study also aims to contribute to the existing literature on higher education quality assessment models by validating the reliability and validity of each dimension outlined in the HEQAM model, assessing the independence of these dimensions, and evaluating the dimensions' suitability in the context of the Benadir region's universities.

The theoretical implications of the study are significant, as it contributes to the discourse on higher education quality assessment and provides insights into the effectiveness and applicability of the HEQAM model in diverse contexts. The practical implications are equally noteworthy, emphasising the importance of conducting comprehensive validation studies before employing assessment tools like the HEQAM model in educational settings. The study's outcomes will enhance our understanding of the instrument's effectiveness, ensuring its application in diverse contexts is sound and reliable. This, in turn, will contribute to more robust and meaningful assessments of the quality of higher education, particularly in underserved regions of developing countries with limited instrument validation studies.

1.2. Importance of the Problem

The significance of this issue is heightened in the context of Noaman et al.'s HEQAM model, designed in 2013 to assess the quality of higher education. Despite its potential to revolutionise quality assessment, the model's singular validation at King Abdulaziz University in Saudi Arabia by Noaman et al. (2013) raises crucial questions about its generalizability to other institutions. The uncertainty extends to whether students and staff in diverse settings perceive higher education quality in alignment with the model's eight constructs. The lack of exploration into the independence or redundancy of these constructs underscores knowledge gaps. Additionally, the absence of studies validating the items within each construct raises concerns about the model's foundational reliability. The ongoing uncertainty poses a significant risk, as researchers may unwittingly use the HEQAM model without confirming its effectiveness, which is especially problematic in developing countries with limited validation studies. The intended research aims to enhance our understanding of the HEQAM model's effectiveness and ensure its reliable application in diverse contexts, a critical step toward fostering more robust assessments of higher education quality, particularly in underserved regions of developing countries.

1.3. Relevant Scholarship

Numerous scholarly inquiries have focused on comprehending the complexities of assessing higher education quality, with researchers developing comprehensive models and frameworks. Previous studies by Noaman et al. (2017), Gilano and Hailegebreal (2021), and Tsinidou et al. (2010) emphasised critical dimensions such as curriculum, faculty, and infrastructure in evaluating educational quality. Other investigations by Akareem and Hossain (2016), Ashraf et al. (2016), and Arrieta and Avolio (2020) delved into factors influencing students' perceptions of quality, highlighting the diverse viewpoints in the assessment process. Moreover, the adaptation of service quality measurement constructs from other industries, like the SERVQUAL and UNIQUAL models, have been applied in higher education evaluation, emphasising the need for rigorous assessment tools. However, the

validation and independence of these constructs, particularly within the HEQAM model, remain crucial aspects unexplored in existing literature, highlighting the significance of the present study.

The review of diverse geographical studies from regions including Indonesia, Turkey, and the United States revealed similarities in assessing higher education quality and the necessity of examining construct independence. Notably, Gbenga's (2016) exploration of wellness perception and MacKenzie et al.'s (2011) analysis of constructs in MIS and behavioural research underscored the importance of validating research tools for reliability. Additionally, studies by Pat-El et al. (2011), Ozdemir et al. (2020), and Khalaf and Khourshed (2017) offered insights into various aspects of measurement tools in higher education yet did not specifically address the validation of the 53-item instrument developed by Noaman et al. The significance of validating scales was further exemplified by Law's (2013) investigation of SERVPERF and HEDPERF scales and Teeroovengadam et al.'s (2019) exploration of the higher education service quality (HESQUAL) scale, underlining their importance in measuring student perceptions.

While these studies have significantly contributed to understanding higher education quality assessment, the present study, grounded in the HEQAM model, aims to provide a comprehensive framework for evaluating the quality of higher education in the specific context of Somalia, contributing to the ongoing discourse on this crucial subject. By focusing on the validation and independence of constructs within the HEQAM model, this research enriches the understanding of higher education quality assessment, offering valuable insights for academia, policymakers, and stakeholders striving to enhance educational standards.

1.4 Research Questions

The primary objective of this study was to ascertain the validity of Noaman et al.'s (2013) Higher Education Quality Assessment Model (HEQAM) for evaluating higher education quality from the perspectives of students in universities in the Benadir region of Somalia. The research was explicitly structured to address three research questions to achieve this overarching goal. These questions were:

1. To what extent do each of the eight dimensions of the HEQAM model demonstrate validity and reliability in assessing the quality of higher education?
2. To what degree do the eight dimensions of the HEQAM model exhibit independence from one another?
3. To what extent is the appropriateness of the eight dimensions of the HEQAM model evident in measuring the quality of higher education?

In pursuit of answers to these research questions, a cross-sectional survey design was implemented, with data collected from a sample of 1805 undergraduate students representing five universities in the Benadir region of Somalia. The researchers deemed this research design appropriate for obtaining comprehensive insights into the validity, reliability, interdependence, and overall suitability of Noaman et al.'s HEQAM model for assessing higher education quality within the specific context of the Benadir region.

2. Method

2.1. Research Design

This study adopted a descriptive survey research design, as Creswell (2018) advocated, to quantitatively capture trends, attitudes, and opinions within a population by examining a representative subset. The survey design proved apt for this research by quantitatively depicting students' perspectives on evaluating higher education quality, thereby conserving time and resources. The chosen cross-sectional sample survey design allowed data collection from a segment of the study population at a single point, avoiding the need for multiple field visits associated with a longitudinal design. This pragmatic decision streamlined the research process and economised resources. Moreover, the survey design facilitated the generalisation of findings from the sample population to the broader target population, encompassing all undergraduate students in higher education institutions within the Benadir region of Somalia, ensuring a comprehensive understanding of the subject.

2.2. Study Population and Sample Size

The study focused on all undergraduate students enrolled in universities within the Benadir region of Somalia, considering their substantial representation in higher education institutions and the standard scrutiny of the quality of education they receive. To manage the extensive number of universities in the region, the accessible population was narrowed down to undergraduate students from five selected universities, including one publicly funded institution and four private entities, chosen to ensure representation from both for-profit and not-for-profit higher education institutions. According to data from the National Commission for Higher Education, these five universities collectively enrolled 27,023 undergraduates. Following the recommendation by Gay and Airasian (2002) that a survey study of this kind should aim for a coverage of 10 per cent and above of the target population, the researcher targeted a sample of 2,700 respondents. Ultimately, the study concluded with the participation of 1,803 students, resulting in a commendable response rate of 66.8%, aligning with the high response rate expectations for surveys of this nature as recommended by scholars. The distribution of study participants across the institutions is detailed in Table 1.

Table 1: Distribution of the Respondents by their Institutions

Type of Institution	Institution	No. of Students	Target size	Sample	Actual Size	Sample size
Private for Profit	UNISO	7293	729		209	
	JUST	4525	453		326	
Private Non-Profit	SU	5473	547		460	
	MU	5850	585		449	
Public university	SNU	3882	388		359	
Total		27023	2700		1803	

2.3. Sampling Procedures

In this study, a multi-stage sampling approach was meticulously employed. The first stage involved the stratified random sampling of universities, categorised into public and private, with further stratification within the private category distinguishing between for-profit and non-profit institutions. The selection of universities within each category utilised a lottery-based random sampling method, ensuring an unbiased representation. Notably, the public university, Somali National University, was automatically included due to its status as the sole public university in the country. In the second stage, respondents were selected based on academic year, focusing on students in their second, third, and fourth years to ensure a comprehensive assessment of education quality. First-year students were excluded, assuming they were in the early stages of their academic journey. Lastly, the survey instrument was distributed through students' WhatsApp groups within these institutions, restricting participation to group members to reach the desired sample size effectively. This approach was chosen because these WhatsApp groups were sufficiently large and representative of the target population.

2.4. Data Collection Method and Instrument

This research's chosen data collection method was the survey approach, explicitly utilising a questionnaire-based survey methodology. As Kumar (2018) articulated, surveys systematically gather data by posing inquiries to individuals with relevant information, a process facilitated through questionnaires or interviews. The questionnaire-based survey methodology was chosen for its effectiveness in obtaining student responses, providing valuable insights to validate Noaman et al.'s (2013) instrument to assess the quality of higher education. This approach also comprehensively understood how students evaluated public and private higher education institutions in the Benadir region. The survey method was deemed efficient, enabling the swift accumulation of data from a substantial pool of participants within a brief timeframe and at a manageable cost.

The data collection process involved an adopted self-administered questionnaire, recognised as a research instrument comprising inquiries designed to elicit information from respondents on a specific topic (Kumar, 2018). Such questionnaires efficiently gauge many subjects' behaviours, attitudes, preferences, opinions, and intentions, offering cost-effective and expeditious data collection. The questionnaire featured closed and open-ended

questions and was disseminated electronically via Google Forms. This choice aimed to assess and establish the reliability and validity of the Noaman et al. (2013) instrument, transforming it into an online format for ease of application. The distribution through specific program coordinators and subsequent sharing within student WhatsApp groups expedited the data collection, allowing respondents to express their perspectives without undue influence. The choice of this instrument format was grounded in its efficiency, accessibility, and capacity to capture diverse perspectives, considering the literacy of the undergraduate student respondents.

2.5. Validity and Reliability of Instrument

Validity, as outlined by Taherdoost (2016), refers to the accuracy of an instrument in measuring the intended constructs, encompassing facets such as the face, content, construct, and criterion validity. This study meticulously assessed all dimensions of validity within this framework. As defined by Taherdoost (2016), reliability pertains to the consistency and stability of results obtained through a measurement instrument, indicating repeatability over time. While the questionnaire used in this study was adopted from Noaman et al.'s (2013) work, where its reliability had been confirmed, the current researcher sought to validate its reliability through confirmatory factor analysis. This approach eliminated the need for pilot testing, as Noaman et al. (2013) previously established the instrument's reliability. The current study focused on validating the consistency of the instrument's items in measuring the quality of higher education.

3. Results

3.1. Research Question 1

The study's primary objective was to address the fundamental research question concerning the validity and reliability of each of the eight dimensions within the Higher Education Quality Assessment Model (HEQAM). Question one stated, "To what extent do each of the eight dimensions of the HEQAM model demonstrate validity and reliability in assessing the quality of higher education?" To accomplish this, the study employed confirmatory factor analysis (CFA), as elucidated by Castello and Osborne (2005), a statistical methodology designed to validate the underlying factor structure of observed variables. Through the strategic application of CFA, the research sought to ascertain the effectiveness of the eight dimensions encapsulated within the HEQAM model as dependable and robust metrics for comprehensively evaluating the quality of higher education. Notably, the comprehensive analysis aimed to determine the soundness and dependability of critical constructs, including curriculum structure, academic staff, career prospects, infrastructure, administrative services, library services, E-services, and location, all of which played integral roles in the HEQAM instrument's comprehensive assessment of higher education quality. The meticulous presentation of the in-depth findings derived from the CFA, complemented by an elaborate overview of the corresponding reliability indices, has been thoughtfully documented in Table 2, emphasising the robust and credible nature of the dimensions integrated within the HEQAM model.

Table 2: Confirmatory Factor Analysis and Reliability Test Result

Construct	Attributes	Factor Loadings	Reliability
Curriculum	The programme provides the appropriate scientific topics for a student's scientific path	0.570	0.634
	Curriculum lines with the requirements of the labour market	0.521	
	The curriculum enhances student skills and self-capabilities	0.656	
	The curriculum has prerequisites for the specific courses.	0.616	
	Weekly timetable	0.575	
	Variety of electives/modules in specialisation areas	0.627	
	The curriculum enhances student skills and self-capabilities	0.656	
	Eigenvalue	2.129	
	% variance explained	35.48	
Academic Staff	Academic qualifications.	0.649	0.755
	Professional experience	0.746	

	Research activity	0.684	
	The faculty is cooperative and responsive	0.628	
	Appropriate academic advising	0.614	
	Communication skills	0.669	
	Eigenvalue	2.704	
	% variance explained	45.09	
Career Prospects	Perspectives for a professional career	0.599	0.800
	Institution's links with business	0.590	
	Enhance technical skills	0.644	
	Enhance communication skills	0.644	
	Linguistic skills	0.640	
	Employment opportunities through job day programmes	0.636	
	Opportunities to continue studies abroad	0.606	
	Availability of exchange programmes with other institutes	0.603	
	Opportunities for postgraduate programmes	0.619	
	Eigenvalue	3.464	
	% variance explained	38.49	
Infrastructure	Modern and high-quality classrooms and laboratories	0.644	0.773
Infrastructure	Catering services	0.645	
	Sport facilities	0.653	
	Medical facilities	0.690	
	High-quality university administration buildings	0.676	
	Availability of services to host social and cultural events	0.674	
	Students' hostel	0.580	
	Eigenvalue	2.981	
	% variance explained	42.58	
Administrative Services	Effective, accurate, and prompt services	0.658	0.793
	Sufficient working hours	0.664	
	The availability of administrative services on the university website	0.719	
	Availability of technical support for e-services	0.716	
	Friendliness	0.626	
	Availability of Advertisement Materials for services	0.656	
	Clear guidelines and advice	0.638	
	Eigenvalue	3.133	
	% variance explained	44.76	
Library Services	Availability of textbooks and journals	0.660	0.801
	Easy borrowing process	0.695	
	The availability of library services electronically	0.794	
	E-library	0.727	
	Sufficient places to sit and read	0.675	
	Working hours	0.654	
	Friendliness	0.567	
	Eigenvalue	3.209	
	% variance explained	45.84	
E-service	The website provides academic and admin. services	0.664	0.778
	Effective, accurate, and prompt services	0.746	
	Prompt technical support	0.759	
	E-Service accessibility through different ways	0.748	
	E-Service through social networks	0.726	
	Eigenvalue	2.661	
	% variance explained	53.22	
Location	Accessibility	0.686	0.755
	Availability of transportation services (out campus)	0.747	
	Cost of transportation	0.721	
	Transportation services among the university buildings (on campus)	0.652	
	Availability of places for parking	0.634	

Safety and security department	0.577
Eigenvalue	2.709
% variance explained	45.15

The findings presented in Table 2 offer a comprehensive overview of the results obtained from the rigorous Confirmatory Factor Analysis (CFA) conducted for each construct within the Higher Education Quality Assessment Model (HEQAM). The CFA effectively distilled the multitude of items encompassed within the various constructs, including but not limited to curriculum structure, academic staff, career prospects, infrastructure, administrative services, library services, and e-services, into coherent singular factors, each demonstrating a strong sense of validity and reliability. Notably, the robust factor loadings, all surpassing the threshold of 0.5, and the commendable Cronbach's alpha values, each exceeding the recommended 0.6 benchmarks, serve as compelling indicators of the remarkable internal consistency embedded within these constructs. These compelling results undeniably affirm the unwavering robustness and credibility of the measurement items encapsulated within the HEQAM model, further attesting to their unwavering trustworthiness in comprehensively evaluating the multifaceted dimensions of higher education quality.

The insightful results from the comprehensive CFA provide a critical foundation for understanding the intricate nuances embedded within the HEQAM model's constructs. The successful extraction of coherent single factors from the diverse items signifies a significant milestone in the validation process, further reinforcing the model's credibility in capturing the multifaceted nature of higher education quality. The substantial factor loadings observed across the constructs, surpassing the critical threshold of 0.5, accentuate the robust relationship between the observed variables and their respective latent constructs. Simultaneously, the commendable Cronbach's alpha values, surpassing the recommended threshold of 0.6, serve as a compelling testament to the reliability and consistency of the measurement items, attesting to the model's ability to comprehensively assess the quality of higher education across various critical dimensions. Overall, these findings serve as a pivotal validation of the HEQAM model, bolstering its position as a comprehensive and reliable tool for evaluating the multifaceted landscape of higher education quality.

Table 2 serves as a comprehensive visual representation of the intricate nuances and underlying statistical robustness encapsulated within the results of the CFA. The detailed presentation of each construct's eigenvalues, factor loadings, and reliability indices provides a comprehensive snapshot of the internal consistency and credibility embedded within the HEQAM model. The compelling presentation of these findings emphasises the robustness and trustworthiness of the model's measurement items, reaffirming their ability to effectively capture and evaluate the multifaceted nature of higher education quality. These meticulously extracted and analysed results underscore the model's efficacy in comprehensively assessing the diverse dimensions of educational quality, thereby contributing to the ongoing dialogue and scholarly discourse surrounding the evaluation of higher education standards.

3.2. Research Question 2

The study's second research question examined the independence of the eight dimensions incorporated within the HEQAM model. The second question was, "To what degree do the eight dimensions of the HEQAM model exhibit independence from one another?" To achieve this, the analysis relied on linear correlation analysis, a method extensively elucidated by Peck et al. (2015) for discerning various variables' distinctiveness and unique characteristics. By leveraging this analytical approach, the research aimed to delineate the nuanced relationships and interdependencies among the dimensions, ultimately unravelling their contributions to the comprehensive evaluation of higher education quality. The meticulous documentation of the findings stemming from the linear correlation analysis, thoughtfully presented in Table 3, serves as a pivotal resource, providing nuanced insights and a comprehensive understanding of the intricate dynamics and interconnected nature of the dimensions encapsulated within the HEQAM model.

Table 3: Inter-correlations of the HEQAM Model Constructs

	CS	AS	CP	IN	AdS	LS	ES	LO
CS	1	0.604**	0.575**	0.507**	0.516**	0.477**	0.447**	0.378**
AS		1	0.662**	0.559**	0.576**	0.550**	0.505**	0.425**
CP			1	0.654**	0.641**	0.622**	0.546**	0.450**
IN				1	0.675**	0.649**	0.572**	0.485**
AdS					1	0.674**	0.607**	0.516**
LS						1	0.637**	0.531**
ES							1	0.599**
LO								1

The insights in Table 3 provide a comprehensive overview of the correlation analyses performed among the diverse dimensions integrated within the Higher Education Quality Assessment Model (HEQAM). The compelling data illustrates that the correlation coefficients established among the eight variables, namely Curriculum Structure (CS), Academic Staff (AS), Career Prospects (CP), Infrastructure (IN), Administrative Services (AdS), Library Services (LS), E-services (ES), and Location (LO), consistently exhibited positive and statistically significant relationships at the 0.05 level (two-tailed). The meticulous examination of these correlation coefficients underscores the significant associations embedded within the constructs, thereby shedding light on the interrelated nature of the multifaceted dimensions encapsulated within the HEQAM model. Specific correlations within the data set were identified as displaying robust relationships, further underscoring their substantial interconnectedness, as indicated by the statistical significance at the $p < 0.01$ level.

The comprehensive findings highlighted in Table 3 serve as a critical testament to the intricate relationships and underlying interdependencies prevalent within the diverse dimensions of the HEQAM model. The compelling presentation of positive correlation coefficients signifies the notable associations and interactions observed among the various constructs, emphasising their interconnected nature and collective impact on the comprehensive evaluation of the quality of higher education. Furthermore, the consistent statistical significance observed at the 0.05 level (two-tailed) accentuates the reliability and robustness of the correlation analyses, further attesting to the significant relationships shared among the dimensions integrated within the HEQAM model. Notably, the identification of correlations demonstrating substantial relationships, underscored by the statistical significance at the $p < 0.01$ level, serves as a compelling indicator of the nuanced and interrelated nature of the critical dimensions encapsulated within the HEQAM model, further contributing to the comprehensive understanding of higher education quality assessment.

Table 3 serves as an essential visual representation of the intricate associations and compelling statistical robustness embedded within the correlation analyses conducted among the various dimensions of the HEQAM model. The meticulous presentation of the positive and statistically significant correlation coefficients accentuates the integral relationships shared among the constructs, further elucidating their collective impact on the holistic evaluation of higher education quality. The consistent statistical significance observed at the 0.05 level (two-tailed) validates the robustness and reliability of the correlation analyses, affirming the significant associations embedded within the HEQAM model. Notably, identifying correlations demonstrating substantial relationships at the $p < 0.01$ level underscores the model's ability to comprehensively assess the intricate inter-dependencies among the critical dimensions, further contributing to the ongoing dialogue and scholarly discourse surrounding evaluating higher education standards.

3.3. Research Question 3

The study was designed to tackle the third research question, which centred on evaluating the appropriateness of the eight dimensions encompassed within the HEQAM model in effectively assessing the quality of higher education. The third research question was, "To what extent is the appropriateness of the eight dimensions of the HEQAM model evident in measuring the quality of higher education?" To respond to this inquiry, the researchers opted to employ an exploratory factor analysis (EFA), a statistical technique elaborated by Castello and Osborne (2005) that facilitates the condensation of complex data into a more concise set of summary variables, thereby enabling the exploration of the underlying theoretical structure of the phenomena under investigation. Leveraging

the capabilities of the EFA, the study successfully streamlined the numerous items involved in measuring the quality of higher education, drawing insights from the responses obtained through the comprehensive survey administered among university students in the Benadir region of Somalia. The detailed and insightful outcomes stemming from the rigorous EFA analysis are meticulously documented and presented comprehensively in Table 4, offering a nuanced and in-depth understanding of the critical nuances associated with the various dimensions encapsulated within the HEQAM model.

Table 4: Factor Loadings for Eight Constructs of the HEQAM Model

Factor	Eigenvalue	% variance	Highly loading items (loading in brackets)
1	14.40	27.18	CP1(0.423), CP2(0.429), CP3 (0.569), CP4 (0.522), CP6(0.550), CP7(0.458)
2	2.17	4.11	CS1(0.499), CS3(0.498), CS (0.558), CS6 (0.418), AS1(0.600), AS2(0.574)
3	1.69	3.19	IN7(0.401), LS1(0.551), LS2(0.616), LS3(0.688), LS4(0.608), LS5(0.516)
4	1.41	2.66	AdS2(0.362), AdS3(0.442), AdS4(0.522), AdS5(0.723), AdS6(0.604)
5	1.20	2.27	LO1 (0.489), LO2(0.638), LO3(0.709), LO4(0.668), LO5(0.574), LO6(0.420)
6	1.16	2.21	ES1(0.599), ES2(0.631), ES3(0.565), ES4 (0.530), ES5 (0.506)
7	1.12	2.12	IN1(0.506), IN2(0.422), IN3(0.486), IN4(0.540)
8	1.05	1.99	CS2(0.436), CS4(0.632)

The insightful data in Table 4 elucidates the outcome of the exploratory factor analysis (EFA) conducted on the 53 items encompassed within the Higher Education Quality Assessment Model (HEQAM) instrument. The analysis results identified eight distinctive factors, with the first eight factors notably demonstrating statistical significance, as indicated by their eigenvalues surpassing the threshold of 1.00. Notably, these factors exhibited a range of eigenvalues from 14.403 to 1.058, collectively accounting for the variation in the 53 items and explaining percentages from 27.175% to 1.996%. The comprehensive overview presented in Table 3 accentuates the significance of the factors identified through the exploratory factor analysis, further contributing to the nuanced understanding of the multifaceted dimensions encapsulated within the HEQAM model and their collective influence on the comprehensive evaluation of higher education quality.

Additionally, the profound insights outlined in Table 4 provide an in-depth exploration of the third research question, emphasising the pivotal role of the Career Prospects (CP) construct as the most substantial factor, featuring valid items for effectively measuring the quality of higher education. Simultaneously, the exclusion of specific items from the analysis, in adherence to the recommendations Rad et al. (2018), further underscores the meticulous approach adopted in the study. The discernible patterns observed within the Curriculum Structure (CS), Academic Staff (AS), Infrastructure (IN), Library Services (LS), Administrative Services (AdS), Location (LO), and E-services (ES) constructs emphasise their inherent significance in the comprehensive evaluation of higher education quality. These noteworthy findings testify to the robustness and comprehensive nature of the HEQAM model proposed by Noaman et al. (2013), highlighting its efficacy in encompassing essential factors for the holistic assessment of higher education standards. The meticulous analysis presented in Table 4 contributes significantly to the ongoing discourse and scholarly exploration surrounding evaluating and enhancing the quality of higher education programs and services.

4. Discussion

This study primarily focused on assessing the validity and reliability of the eight dimensions comprising the Higher Education Quality Assessment Model (HEQAM) in evaluating higher education quality. The research findings offered crucial insights into the significance of each dimension in appraising educational quality, drawing on comparisons and contrasts with existing literature. Notably, the study emphasised the fundamental role of curriculum structure as an essential quality indicator in higher education, aligning with the perspectives of

Tsinidou et al. (2010) and Bairagya and Joy (2021) while diverging from the viewpoint of Gilano and Hailegebreal (2021), who minimised its importance. Additionally, the study underscored the substantial influence of academic staff quality on higher education assessment, in alignment with the conclusions of Tsinidou et al. (2010) and Yildiz and Kara (2009) while conflicting with the findings of Gilano and Hailegebreal (2021). The research also highlighted the critical role of career prospects as an essential criterion for evaluating the quality of university education, echoing the observations of Tsinidou et al. (2010) and Noaman et al. (2017).

The study's second objective was to establish the pairwise independence of the eight dimensions in the HEQAM instrument. The results uncovered significant positive correlations among all eight constructs, with particular dimensions demonstrating solid associations. These findings were consistent with Noaman et al.'s (2017) previous research, which underscored the interconnected nature of the HEQAM model dimensions in evaluating higher education quality. Similarly, Gilano and Hailegebreal's (2021) study, employing dimensions similar to Noaman et al.'s (2013), emphasised the interrelatedness of the eight aspects in gauging higher education quality. Furthermore, Tsinidou et al.'s (2010) investigation revealed notable associations among seven of the eight examined dimensions. The third objective aimed to evaluate the reasonableness of the eight dimensions within the HEQAM model for assessing higher education quality. The exploratory factor analysis (EFA) findings demonstrated the presence of eight distinct factors, each significant and collectively explaining a substantial proportion of the variation in the 53 items. The confirmatory factor analysis (CFA) results further confirmed the validity and reliability of each construct within the HEQAM model, exhibiting robust factor loadings and high internal consistency. These outcomes reinforced the HEQAM model's effectiveness in comprehensively evaluating the multifaceted aspects of higher education quality, highlighting its applicability and robustness in diverse research contexts. Overall, the study contributed valuable insights into the intricate dimensions of the HEQAM model, emphasising its utility in the comprehensive assessment of higher education quality.

5. Conclusion

In conclusion, this study successfully established the validity and reliability of each of the eight dimensions of the Higher Education Quality Assessment Model (HEQAM) as quality measures in higher education for students in universities within the Benadir region of Somalia. The research confirmed the pairwise independence of these dimensions, acknowledging their assessability while recognising their interconnected nature. Furthermore, the study demonstrated that the eight dimensions serve as reasonable quality measures, with varying degrees of significance identified through exploratory factor analysis. In light of these findings, the study recommends developing targeted quality improvement plans, emphasising resources on the most significant dimensions such as curriculum structure, academic staff quality, and career prospects. Establishing a continuous assessment and monitoring system involving regular data collection and analysis on all dimensions to identify emerging trends is also advised. Active engagement of students, faculty, and other stakeholders in the quality improvement process is encouraged, fostering open communication channels for feedback and collaboration. These recommendations aim to enhance the overall quality of higher education in the Benadir region. The study's contributions provide valuable insights and empirical evidence supporting the comprehensive and robust nature of the HEQAM model in evaluating higher education quality.

Author Contributions: Conceptualisation, A.M.O., D.O. and I.E.; methodology, D.O.; software, A.M.O.; formal analysis, I.E. and D.O.; writing—original draft preparation, A.M.O. and D.O.; writing—review and editing, A.M.O, D.O. and I.E. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by SIMAD University through its Staff Development Programme.

Conflicts of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics approval: All subjects gave informed consent for inclusion before participating in the study. The study was conducted following the Declaration of Helsinki, and the protocol was

approved by the Research and Higher Degrees Committee of East African School of Higher Education Studies and Development, Makerere University.

Acknowledgements: The authors extend their sincere gratitude to the management of SIMAD University for their generous sponsorship of this study. Special thanks are also due to all the respondents who participated in the research and the reviewers, whose insightful feedback and constructive suggestions have contributed significantly to the overall quality of this work.

References

- Abbas, J. (2020). HEISQUAL: A modern approach to measure service quality in higher education institutions. *Studies in Educational Evaluation*, 67, 100933. <https://doi.org/10.1016/j.stueduc.2020.100933>
- Akareem, H. S., & Hossain, S. S. (2016). Determinants of education quality: what makes students' perception different? *Open Review of Educational Research*, 3(1), 52–67. <https://doi.org/10.1080/23265507.2016.1155167>
- Arrieta, M. D. C., & Avolio, B. (2020). Factors of higher education quality service: The case of a Peruvian university. *Quality Assurance in Education*, 28(4), 219-238. <https://doi.org/10.1108/QAE-03-2020-0037>
- Ashraf, M.A., Osman, A.Z.R. and Ratan, S.R.A. (2016), "Determinants of quality education in private universities from student perspectives: A case study in Bangladesh", *Quality Assurance in Education*, Vol. 24 No. 1, pp. 123-138.
- Asiyai, R. I. (2020). Best practices for quality assurance in higher education: implications for educational administration. *International Journal of Leadership in Education*, 25(5), 843–854. <https://doi.org/10.1080/13603124.2019.1710569>
- Asnawi, N., & Setyaningsih, N. D. (2020). Perceived service quality in Indonesian Islamic higher education context. *Journal of International Education in Business*, 13(1), 107–130. <https://doi.org/10.1108/jieb-11-2019-0054>
- Bairagya, I., & Joy, B. (2022). What determines the quality of higher education? A study of commerce graduates in Kerala (India). *Journal of the Asia Pacific Economy*, 27(1), 1-25.
- Batiibwe, M. S., Bakkabulindi, F. E., & Mango, J. M. (2017). Is the SAMR Model Valid and Reliable for Measuring the Use of ICT in Pedagogy? Answers from a Study of Teachers of Mathematical Disciplines in Universities in Uganda. *International Journal of Computing & ICT Research*, 11(1)
- Castello A.B. and Osborne J.W. (2005). "Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis". *Practical Assessment, Research & Evaluation*, 10(7), 1-9.
- Cavallone, M., Manna, R., & Palumbo, R. (2020). *Filling in the gaps in higher education quality*. 34. <https://doi.org/10.1108/ijem-06-2019-0189>
- Creswell, J. W. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publication.
- Datta, K. S., & Vardhan, J. (2017). A SERVQUAL-based framework for assessing quality of international branch campuses in UAE: A management students' perspective. *SAGE Open*, 7(1), 2158244016676294.
- Dicker, R., Garcia, M., Kelly, A., & Mulrooney, H. (2018). What does 'quality' in higher education mean? Perceptions of staff, students, and employers. *Studies in Higher Education*, 44(8), 1425–1441. <https://doi.org/10.1080/03075079.2018.1445987>
- Gay, L. R., & Airasian, P. W. (2002). *Educational Research: Competencies for Analysis and Applications S/G*. Addison Wesley Longman.
- Gbenga, J. B. (2016). Reliability and validity testing of modified structured wellness questionnaire for monitoring the wellness perception of university students. *Makerere Journal of Higher Education*, 7(2), 91-104.
- Gerritsen-van Leeuwenkamp, K. J., Joosten-ten Brinke, D., & Kester, L. (2019). Students' perceptions of assessment quality related to their learning approaches and learning outcomes. *Studies in Educational Evaluation*, 63, 72–82. <https://doi.org/10.1016/j.stueduc.2019.07.005>
- Gilano, G., & Hailegebreal, S. (2021). Assessment of Educational Quality and Associated Factors: The Case of Arba Minch College of Health Sciences in 2017, South Ethiopia. *Education Research International*, 2021, 1–9. <https://doi.org/10.1155/2021/8854366>
- Jelena, L. (2010). Determinants of service quality in higher education. *Interdisciplinary, Management Research*, 6, 631-647.
- Khalaf, M. A., & Khourshed, N. (2017). Performance-based service quality model in postgraduate education. *International Journal of Quality & Reliability Management*, 34(5), 626–648. <https://doi.org/10.1108/ijqrm-04-2015-0059>

- Kumar, R. (2018). *Research methodology: A step-by-step guide for beginners*. *Research methodology*, 1-528.
- La Rotta, D., Usuga, O. C., & Clavijo, V. (2020). Perceived service quality factors in online higher education. *Learning Environments Research*, 23(2), 251-267. <https://doi.org/10.1007/s10984-019-09299-6>
- Law, D.C.S. (2013), "Initial assessment of two questionnaires for measuring service quality in the Hong Kong post-secondary education context", *Quality Assurance in Education*, Vol. 21 No. 3, pp. 231-246. <https://doi.org/10.1108/QAE-Sep-2012-0034>
- MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly*, 293-334.
- Milojević, R., & Radosavljević, M. (2019). Assessment of Higher Education Service Quality: *Integration of Servqual Model and AHP Method*. *Teme*, 557. <https://doi.org/10.22190/teme190131034m>
- Noaman, A. Y., Ragab, A. H. M., Fayoumi, A. G., Khedra, A. M., & Madbouly, A. I. (2013, September). HEQAM: A developed higher education quality assessment model. In 2013 *Federated Conference on Computer Science and Information Systems* (pp. 739-746). IEEE
- Noaman, A. Y., Ragab, A. H. M., Madbouly, A. I., Khedra, A. M., & Fayoumi, A. G. (2017). Higher education quality assessment model: towards achieving educational quality standard, *Studies in Higher Education*, 42(1), 23–46. <https://doi.org/10.1080/03075079.2015.1034262>
- Ozdemir, Y., Kaya, S. K., & Turhan, E. (2020). A scale to measure sustainable campus services in higher education: "Sustainable Service Quality." *Journal of Cleaner Production*, 245, 118839. <https://doi.org/10.1016/j.jclepro.2019.118839>
- Pat-El, R. J., Tillema, H., Segers, M., & Vedder, P. (2011). Validation of Assessment for Learning Questionnaires for teachers and students. *British Journal of Educational Psychology*, 83(1), 98–113. <https://doi.org/10.1111/j.2044-8279.2011.02057.x>
- Peck, R., Olsen, C., & Devore, J. L. (2015). *Introduction to statistics and data analysis*. Cengage Learning.
- Salahshour Rad, M., Nilashi, M., & Mohamed Dahlan, H. (2018). Information technology adoption: a review of the literature and classification. *Universal Access in the Information Society*, 17, 361-390.
- Sann, R., Lai, P.-C., Liaw, S.-Y., & Chen, C.-T. (2023). Multidimensional scale development and validation: university service quality (UNIQUAL). *Journal of Hospitality and Tourism Insights*. <https://doi.org/10.1108/jhti-08-2022-0343>
- Seyfried, M., & Pohlenz, P. (2018). Assessing quality assurance in higher education: quality managers' perceptions of effectiveness. *European Journal of Higher Education*, 8(3), 258–271. <https://doi.org/10.1080/21568235.2018.1474777>
- Taherdoost, H. (2016). Validity and reliability of the research instrument; how to test the validation of a questionnaire/survey in research. How to test the validation of a questionnaire/survey in research. <http://dx.doi.org/10.2139/ssrn.3205040>
- Teeroovengadam, V., Nunkoo, R., Gronroos, C., Kamalanabhan, T. J., & Seebaluck, A. K. (2019). Higher education service quality, student satisfaction and loyalty. *Quality Assurance in Education*, 27(4), 427–445. <https://doi.org/10.1108/qaе-01-2019-0003>
- Tsinidou, M., Gerogiannis, V. and Fitsilis, P. (2010), "Evaluation of the factors that determine quality in higher education: an empirical study", *Quality Assurance in Education*, Vol. 18 No. 3, pp. 227-244. <https://doi.org/10.1108/09684881011058669>
- Yildiz, S. M., & Kara, A. (2009). The PESPERF scale. *Quality Assurance in Education*, 17(4), 393–415. <https://doi.org/10.1108/09684880910992359>