Education Quarterly Reviews

Firmansyah, F., Sudadio, & Juansah, D. E. (2025). The Role of Change Leadership, Academic Supervision, and Self-Efficacy Mediated by Motivation to Improve Teacher Pedagogical Performance. *Education Quarterly Reviews*, 8(2), 82-94.

ISSN 2621-5799

DOI: 10.31014/aior.1993.08.02.581

The online version of this article can be found at:
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Published by:
The Asian Institute of Research

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The Asian Institute of Research
Education Quarterly Reviews
Vol.8, No.2, 2025: 82-94
ISSN 2621-5799
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DOI: 10.31014/aior.1993.08.02.581

The Role of Change Leadership, Academic Supervision, and Self-Efficacy Mediated by Motivation to Improve Teacher Pedagogical Performance

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Abstract
The average score of 59.03 in the 2022 Teacher Competency Test indicates the low pedagogical competence of teachers in Cilegon City. Low pedagogical competence has an impact on the declining quality of learning, curriculum achievement, and student learning outcomes. This study aims to analyse the effect of changed leadership, academic supervision, and self-efficacy on teacher pedagogical performance, with work motivation as a mediating variable. This study uses a quantitative approach with an ex post facto survey method and a path analysis model to test direct and indirect relationships between variables. The results of the study indicate that change leadership, academic supervision, and self-efficacy have a significant effect on teacher work motivation. Furthermore, the study demonstrates that work motivation significantly acts as a mediator in shaping teacher pedagogical competence. Adaptive change leadership, substantive implementation of academic supervision, and strong self-efficacy, when combined with high work motivation, can improve teacher pedagogical performance more optimally. The novelty of this study lies in the mapping of the role of motivation as a mediating variable that bridges the influence of leadership, supervision, and self-efficacy on teacher pedagogical performance holistically. This finding provides an important contribution to the development of a more contextual and sustainable educational intervention model, especially in improving teacher quality and education quality in Indonesia.

Keywords: Academic Supervision, Change Leadership, Motivation, Self-Efficacy, Teacher Pedagogical Performance

1. Introduction

The role of educators in attaining excellent educational accomplishment is crucial for the enhancement and development of human resources. Competent human resources capable of excelling in various domains significantly influence the attainment of national educational objectives and the advancement of the Unitary State of the Republic of Indonesia (Indrawati & Kuncoro, 2021), the presence of skilled and proficient individuals in

the education sector can facilitate student learning outcomes and enhance the overall quality of education (Chester et al., 2002). Numerous variables might signify an enhancement in educational quality, encompassing school facilities and infrastructure , educational expenses, teaching staff, educational personnel, parental involvement, student engagement aspects, and school administration in the orchestration of education (Aithal & Maiya, 2023; Firdaus et al., 2025; Shukla, 2023). Teachers with high performance quality will continually enhance educational standards; conversely, those whose performance falls below the minimal threshold will impede the advancement and growth of educational quality (Seery et al., 2022). Teachers will excel if the principal offers direction and oversight of their work. Educators are a critical component in the education system that enhances student accomplishment (Saronto, 2025). Consequently, any initiatives aimed at enhancing educational quality would be ineffectual without the backing of skilled and experienced educators. Enhancement of teacher effectiveness is essential to attain the established educational objectives via diverse efforts and tactics.

According to the results of the 2022 Teacher Competency Test, the average pedagogical competence in Cilegon City was 59.03 (npd.kemdikbud.go.id). The pedagogical competency test results for Cilegon City, which stands at 59.03, indicates that the pedagogical competence of instructors in the area is deficient. Pedagogical competence refers to a teacher's capacity to engage with students, organize and execute educational experiences, assess learning outcomes, and facilitate the realization of students' diverse potentials. The inadequate pedagogical competence indicates that many educators must enhance their skills and proficiency in delivering quality education to pupils (Bremner et al., 2023). The influence of inadequate teacher pedagogical ability is evident in the learning process, when the quality of instruction and instructors' comprehension of the content are suboptimal (Toom, 2024). This may also affect pupils' comprehension and proficiency in mastering the subject matter effectively. Furthermore, inadequate teacher pedagogical competence will adversely affect the quality of instruction provided by educators, which will consequently diminish the overall quality of school education and, by extension, the national education system (Torrance et al., 2022).

Low teacher pedagogical performance can reduce the quality of learning in the classroom, because teacher pedagogical competence plays an important role in creating an effective and meaningful learning process for students (König et al., 2021). Limitations in pedagogical knowledge and classroom management cause the quality of learning to decline, so students do not get an optimal learning experience (Yang & Kaiser, 2022). This impacts low student motivation, participation, and involvement in the learning process, ultimately reducing the overall quality of education (Bremner et al., 2022).

In addition, low teacher pedagogical performance also directlyimpacts the achievement of curriculum objectives, because teachers who do not have adequate pedagogical competence tend to have difficulty implementing the curriculum effectively (Rokimin & Manaf, 2024). Suboptimal teacher quality and pedagogical competence cause the learning objectives designed in the curriculum not to be achieved optimally (Sudargini & Purwanto, 2020). As a result, the learning process becomes less focused and unable to meet the expected educational standards (Roca-Campos et al., 2021).

Another impact of low pedagogical performance is a decline in student learning outcomes in terms of academic achievement and non-cognitive development (Sağlam et al., 2023). Research shows that teacher pedagogical competence significantly influences student learning outcomes, where increasing this competence can improve academic achievement and student development as a whole (Cobanoglu et al., 2023). Therefore, efforts to improve teacher pedagogical performance are significant to ensure optimal learning quality, curriculum objectives, and student learning outcomes (Bednar & Brown, 2024).

The problem of low teacher pedagogical competence in Indonesia is increasingly prominent, along with changes in education policies that require teachers to continue to adapt to new demands in the learning process (Hertz et al., 2022). Teachers are expected to be able to master various pedagogical competencies, such as understanding student characteristics, applying learning theories, and managing classes effectively. However, in reality, many teachers still face obstacles in their implementation due to limited ongoing training and adequate supporting facilities (Zulkarnain et al., 2025). In addition, low student learning outcomes and teacher competencies indicate

that mastery of pedagogical competencies is not optimal, so special strategies are needed to improve the quality of education by strengthening teacher competencies (Amaliah et al., 2024).

On the other hand, not all schools have leadership that is adaptive to change, even though responsive leadership is critical to support teachers in facing the dynamics of education policy (Mallillin, 2022). Adaptive leadership can encourage innovation, strengthen accountability, and provide solutions to the challenges faced by teachers in the learning process (Grice et al., 2023). The lack of adaptive leadership makes it difficult for teachers to adapt to change, resulting in low motivation and performance in developing pedagogical competence (Singerin, 2024a). Therefore, strengthening adaptive leadership in the school environment is one of the keys to improving teacher pedagogical competence and the overall quality of education.

The problem of low teacher pedagogical competence in schools is often rooted in the implementation of academic supervision, which tends to be administrative and does not touch on the substantive aspects of improving teaching quality (Yani et al., 2022). Many teachers do not yet understand the function and implementation of academic supervision, so efforts to improve pedagogical competence do not run optimally. In addition, the effectiveness of academic supervision carried out by the principal is generally still in the moderate category. Hence, its contribution to developing teachers' pedagogical competence is also limited (Saleh & Mutiani, 2021). This is exacerbated by the lack of supervisors who can provide intensive assistance in implementing academic supervision in schools.

Academic supervision that only focuses on administrative aspects, such as the completeness of learning documents, often ignores the need for teachers to get constructive feedback regarding teaching practices in the classroom (Singerin, 2024b). As a result, improving teachers' pedagogical competence is slow and uneven, because supervision has not been directed at effectively strengthening skills in managing learning (Ahmadi & Hadi, 2023). Research shows that optimizing substantive academic supervision can significantly improve teachers' pedagogical competence (Suryani, 2023). Therefore, a paradigm shift is needed in implementing academic supervision to emphasize more on fostering professionalism and classroom learning quality.

Teachers with high self-efficacy tend to be more confident in developing learning strategies, facing challenges in the classroom, and building positive relationships with students, which ultimately impacts the quality of the learning process and the psychological well-being of teachers (Hajovsky et al., 2020). Teacher self-efficacy also plays an important role in increasing enthusiasm, job satisfaction, and commitment to the profession and reducing the risk of work exhaustion or burnout (Haghayeghi & Moghadamzadeh, 2025; Huang et al., 2019). In addition, teachers with strong self-efficacy can better manage classroom behavior and adjust teaching practices according to student needs, including in the context of inclusive education (Wray et al., 2022).

However, in changing learning systems, many teachers experience confusion or uncertainty regarding their roles and responsibilities, which can affect the development of their professional identity and self-efficacy (Marschall, 2022). This uncertainty often arises due to external pressures, such as administrative demands, curriculum changes, or the shift to online learning, which require teachers to continuously adapt and develop new skills (Martin & Mulvihill, 2019). In this context, doubt or self-doubt can trigger teachers to evaluate themselves and seek more effective learning strategies, so the learning process continues optimally even amid change.

Teacher work motivation is an important internal factor in encouraging teachers to actualize their professional potential optimally. This motivation does not only come from intrinsic factors such as personal goals, sense of achievement, and individual characteristics, but is also influenced by extrinsic factors such as national education policies, support from colleagues, and a conducive school environment (Rothinam, 2023). Teachers with high work motivation tend to show greater commitment to their profession, create a supportive classroom atmosphere, and have better psychological resilience in facing work challenges.

Without strong work motivation, supervision, or training efforts given to teachers, they are often unable to produce significant behavioral changes, so teachers tend to work routinely and are less reflective of the learning practices carried out (Wulandari et al., 2022). Research shows that high work motivation is directly related to increased teacher performance, productivity, and job satisfaction, while low motivation can cause teachers to be less

innovative and less enthusiastic in developing themselves and their students (Layek & Koodamara, 2024). Therefore, it is important for educational institutions to create a supportive environment and effective human resource management strategies to increase teacher work motivation sustainably.

Most studies on teacher performance focus on the direct influence of leadership, supervision, or self-efficacy on teacher performance in schools (Luo et al., 2024; E. Puspitasari, 2024). These studies show that principal leadership, academic supervision, and teacher self-efficacy levels have a positive and significant relationship with improving teacher performance, both individually and collectively In addition, factors such as professional development, job satisfaction, and compensation have also been shown to play a role in supporting teacher performance through the influence of leadership and self-efficacy (Mammadzada, 2021).

However, there is still little research that deeply explores the role of motivation as a mediator that bridges the relationship between leadership, supervision, or self-efficacy with teacher pedagogical performance as a whole (Huda et al., 2025). Several recent findings highlight that work motivation can be a key factor that strengthens the impact of leadership and organizational culture on teacher performance, but the mediating mechanism of this motivation has not been studied comprehensively (Nadrah, 2023). Therefore, further research is needed to examine the role of change leadership, academic supervision, and self-efficacy in teacher pedagogical performance mediated by motivation as a link between various key factors so that it can provide a more complete understanding of efforts to improve the quality of education.

Discuss the relevant related literature, but do not feel compelled to include an exhaustive historical account. Assume that the reader is knowledgeable about the basic problem and does not require a complete accounting of its history. A scholarly description of earlier work in the introduction provides a summary of the most recent directly related work and recognizes the priority of the work of others. Citation of and specific credit to relevant earlier works are signs of scientific and scholarly responsibility and are essential for the growth of a cumulative science. In the description of relevant scholarship, also inform readers whether other aspects of this study have been reported on previously and how the current use of the evidence differs from earlier uses. At the same time, cite and reference only works pertinent to the specific issue and not those that are of only tangential or general significance. When summarizing earlier works, avoid nonessential details; instead, emphasize pertinent findings, relevant methodological issues, and major conclusions. Refer the reader to general surveys or research syntheses of the topic if they are available. Demonstrate the logical continuity between previous and present work. Develop the problem with enough breadth and clarity to make it generally understood by as wide a professional audience as possible (Beck & Sales 2001). Do not let the goal of brevity lead you to write a statement intelligible only to the specialist.

2. Hypotheses Development and Research Design

The primary research question asks: direct effect of change leadership on motivation (H1), direct effect of academic supervision on motivation (H2), direct effect of self-efficacy on motivation (H3), direct effect of change leadership on teacher pedagogical performance (H4), direct effect of academic supervision on teacher pedagogical performance (H5), direct effect of self-efficacy on teacher pedagogical performance (H6), direct effect of motivation on teacher pedagogical performance (H7), indirect effect of change leadership on teacher pedagogical performance through motivation (H8), indirect effect of academic supervision on teacher pedagogical performance through motivation (H9), indirect effect of self-efficacy on teacher pedagogical performance through motivation (H10), and indirect effect of change leadership, academic supervision, and self-efficacy simultaneously on teacher pedagogical performance through motivation (H11).

Improving teacher performance is a central issue in efforts to improve the quality of education, where teachers are not only required to master the technical aspects of learning, but also need to be supported by work motivation, effective leadership, and strong self-confidence (Mutiara & Ayu, 2024). Various studies have shown that technical training alone cannot change teacher performance significantly. Hence, interventions that integrate motivational reinforcement, change leadership, and self-efficacy are critical to create a productive and innovative work environment (Wahyuti & Boussanlègue, 2025). In addition, school leadership that empowers and provides space

for teachers to develop professionally has increased teacher motivation, commitment, and teaching quality (Irwanto & Maria, 2025).

In Indonesia, the need for a more contextual model for improving teacher performance is increasingly time-sensitive, considering that the educational challenges faced at the local level require adaptive and relevant solutions (Pujilestari et al., 2023). Previous research confirms that strategies that combine training, motivational reinforcement, change leadership, and self-efficacy development can make a real contribution to improving teacher performance and student learning outcomes (Miranti et al., 2024). Thus, the results of this study are expected to be the basis for designing educational interventions that are more effective, sustainable, and in accordance with the specific needs of teachers in Cilegon City and in Indonesia in general (Khofi, 2024).

3. Research Methods

This study employs a quantitative approach and utilises an ex post facto survey as its research method. The main problem in this study is to see the effect of change leadership, academic supervision, and self-efficacy on teacher pedagogical competence through motivation, so this research model is path analysis consisting of exogenous and endogenous variables. Exogenous variables are variables that affect other variables, either directly or indirectly. In this study, exogenous variables consist of change leadership (CL), academic supervision (AS), and self-efficacy (SE). Other variables exert an influence on endogenous variables. In this study, the endogenous variables are teacher motivation (Mo) and teacher pedagogical competence (TPP). The theoretical framework of this research is in Figure 1.

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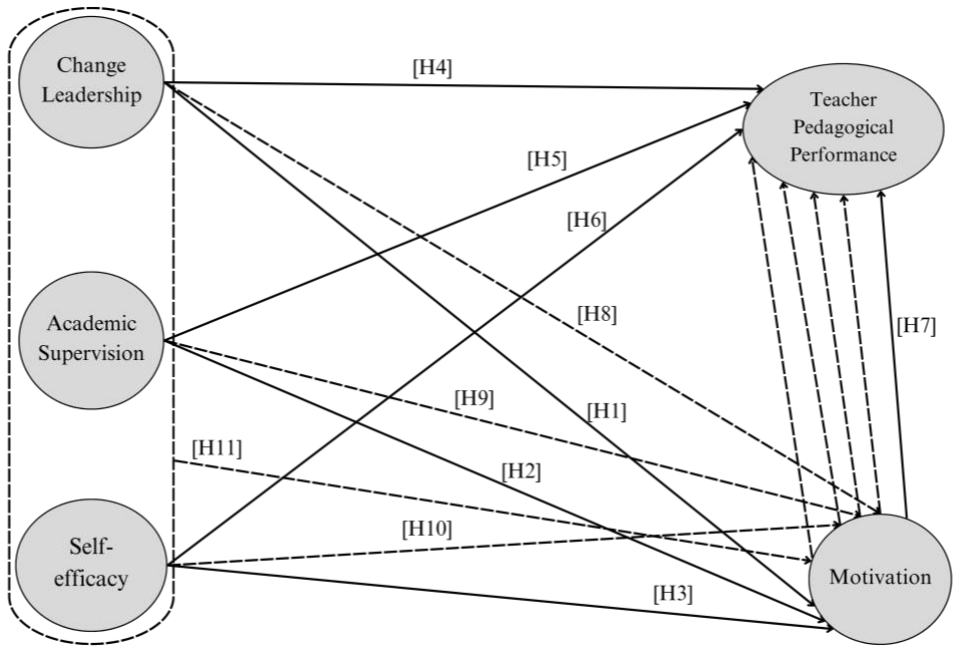

Figure 1: Research theoretical framework

The target population of this study was all teachers of State Junior High Schools throughout Cilegon City, with the status of civil servants and a population of 507 teachers. The sample data were 230 teachers, 87 men (38%) and 143 women (62%). The target population for this study comprises all junior high school teachers in Cilegon City as outlined below (table 1):

Table 1: Population and research sample

School name	Subdistrict	Number of Population	Number of Sampel
State Junior High School 1 Cilegon	Jombang	42	33
State Junior High School 2 Cilegon	Cilegon	32	25
State Junior High School 3 Cilegon	Grogol	54	42
State Junior High School 4 Cilegon	Ciwandan	51	40
State Junior High School 5 Cilegon	Cibeber	56	44
State Junior High School 6 Cilegon	Pulomerak	36	28
State Junior High School 7 Cilegon	Cilegon	29	23
State Junior High School 8 Cilegon	Cibeber	33	26
State Junior High School 9 Cilegon	Ciwandan	28	22
State Junior High School 10 Cilegon	Pulomerak	24	19
State Junior High School 11 Cilegon	Citangkil	32	25
State Junior High School 12 Cilegon	Purwakarta	24	19
State Junior High School 13 Cilegon	Jombang	27	21
State Junior High School 14 Cilegon	Citangkil	25	20
State Junior High School 15 Cilegon	Grogol	14	11
Total		507	230

The validation and reliability procedures guarantee that the questionnaire yields precise and consistent measurements among various responders. The analytical procedure adheres to a systematic sequence to guarantee statistical integrity. This research instrument uses a Likert scale of 1-5 (table 2). The instrument or questionnaire is compiled by containing statements that have been equipped with alternative answer choices.

Table 2: Likert Scale Statement

Likert Scale Statement		Likert scale
Positif	Negatif	
Strongly agree	Strongly disagree	5
Agree	Disagree	4
Neutral	Neutral	3
Disagree	Agree	2
Strongly disagree	Strongly agree	1

Data analysis techniques in the study used SPSS version 25; the test in this study used the classical assumption test using the Kolmogorov-Smirnov estimation error normality test, linearity test, regression test, multicollinearity test, and Glejser heteroscedasticity test. The hypothesis test employed the correlation test, utilising the Pearson product moment and the Sobel test.

4. Results

The normality test is a statistical method to determine whether the collected data follows a normal distribution. A normal distribution, often described as a "mountain" or "bell" shape, has most of the data centred around the middle value and little data at either end (Mohd Ibrahim, 2024). This test is important in quantitative analysis because many statistical techniques, such as regression analysis and t-tests, assume that the data are normally distributed. Based on the results of the normality test, it can be concluded that all data in this study are normally distributed (table 3).

Table 3: Recapitulation of the results of the Kolmogorov-Smirnov estimation error normality test

Variable	Probability of significance	α = 0.05	Criteria	Conclusion
CL → Mo	0.20	0.05	0.20 > 0.05	Normally Distributed
SE → Mo	0.29	0.05	0.29 > 0.05	Normally Distributed
AS → Mo	0.23	0.05	0.23 > 0.05	Normally Distributed
CL → TPP	0.18	0.05	0.18 > 0.05	Normally Distributed
SE → TPP	0.90	0.05	0.90 > 0.05	Normally Distributed
AS → TPP	0.27	0.05	0.27 > 0.05	Normally Distributed
Mo → TPP	0.32	0.05	0.32 > 0.05	Normally Distributed

A linearity test is a statistical procedure used to determine whether there is a linear relationship between two or more variables. The linearity test aims to determine whether there is a linear relationship between the dependent variable and the independent variable in a regression model (Hall & Oakes, 2023). Based on the results of the linearity test and the significance test of the regression equation above, it can be concluded that the data in this study are all linear and have a significant regression equation (table 4 and table 5).

Table 4: Recapitulation of linearity test results

Variable	Linearity	Deviation from linearity	α = 0.05	Conclusion
CL → Mo	0.003 < 0.05	0.10 > 0.05	0.05	Linear
SE → Mo	0.003 < 0.05	0.12 > 0.05	0.05	Linear
AS → Mo	0.001 < 0.05	0.17 > 0.05	0.05	Linear
CL → TPP	0.002 < 0.05	0.12 > 0.05	0.05	Linear
SE → TPP	0.002 < 0.05	0.13 > 0.05	0.05	Linear
AS → TPP	0.001 < 0.05	0.14 > 0.05	0.05	Linear
Mo → TPP	0.000 < 0.05	0.16 > 0.05	0.05	Linear

Table 5: Recapitulation of regression test results

Variable	t value	t table	sig.	α = 0.05	Conclusion
CL → Mo	2.518	1.971	0.003	0.05	Significant
SE → Mo	3.001	1.971	0.002	0.05	Significant
AS → Mo	2.351	1.971	0.001	0.05	Significant
CL → TPP	6.724	1.971	0.001	0.05	Significant
SE → TPP	7.925	1.971	0.000	0.05	Significant
AS → TPP	7.243	1.971	0.000	0.05	Significant
Mo → TPP	9.537	1.971	0.002	0.05	Significant

The multicollinearity test is one of the statistical techniques used to identify the presence of a high correlation between two or more independent variables in a regression model (Clark-Carter, 2024). This test is important because multicollinearity can cause problems in the estimation and interpretation of regression coefficients, thus affecting the accuracy of the model. Based on the results of the multicollinearity test analysis, it was obtained that all data had a tolerance value greater than 0.100 and a VIF value of less than 10.00 (table 6). Table 6 indicates the absence of multicollinearity symptoms.

Table 6: Recapitulation of multicollinearity test results

Variable	Criteria		Conclusion
	Tolerance	VIF	
CL → Mo	0.158 > 0.100	9.173 < 10.00	There are no symptoms of multicollinearity
SE → Mo	0.134 > 0.100	8.429 < 10.00	There are no symptoms of multicollinearity
AS → Mo	0.179 > 0.100	8.562 < 10.00	There are no symptoms of multicollinearity
CL → TPP	0.122 > 0.100	7.473 < 10.00	There are no symptoms of multicollinearity
SE → TPP	0.164 > 0.100	9.715 < 10.00	There are no symptoms of multicollinearity

Variable	Criteria		Conclusion
	Tolerance	VIF	
AS → TPP	0.182 > 0.100	7.531 < 10.00	There are no symptoms of multicollinearity
Mo → TPP	0.119 > 0.100	9.935 < 10.00	There are no symptoms of multicollinearity

The heteroscedasticity test is a statistical procedure used to determine whether a regression model exhibits inequality in residual variance (Clark-Carter, 2024). In regression analysis, a crucial assumption is that the error variance (residual) remains constant across the range of independent variable values, a condition referred to as homoscedasticity. The results of the heteroscedasticity test indicated that all data had a significant probability value of less than 0.05 (see table 7). Therefore, it can be concluded from table 7 that none of the data displayed symptoms of heteroscedasticity.

Table 7: Recapitulation of heteroscedasticity test results

Variable	Sig.	α = 0.05	Criteria	Conclusion
CL → Mo	0.735	0.05	0.735 > 0.05	There are no symptoms of heteroscedasticity
SE → Mo	0.328	0.05	0.328 > 0.05	There are no symptoms of heteroscedasticity
AS → Mo	0.410	0.05	0.410 > 0.05	There are no symptoms of heteroscedasticity
CL → TPP	0.614	0.05	0.614 > 0.05	There are no symptoms of heteroscedasticity
SE → TPP	0.328	0.05	0.328 > 0.05	There are no symptoms of heteroscedasticity
AS → TPP	0.329	0.05	0.329 > 0.05	There are no symptoms of heteroscedasticity
Mo → TPP	0.538	0.05	0.538 > 0.05	There are no symptoms of heteroscedasticity

Hypothesis testing in path analysis examines the causal relationships between variables in a model. Path analysis is a statistical technique used to explore and verify complex causal relationship models in table 8, table 9, and table 10 involving exogenous variables (change leadership, principal academic supervision, and self-efficacy) and endogenous variables (motivation and teacher pedagogical performance).

Table 8: Recapitulation of direct influence test results

Variable	Path coefficient	t value	t table	*p*-value	Conclusion
CL → Mo	0.483	2.618	1.971	0,001	Positive and significant
SE → Mo	0.371	3.936	1.971	0.000	Positive and significant
AS → Mo	0.352	4.537	1.971	0.001	Positive and significant
CL → TPP	0.437	3.835	1.971	0.002	Positive and significant
SE → TPP	0.381	3.925	1.971	0.002	Positive and significant
AS → TPP	0.530	5.538	1.971	0.003	Positive and significant
Mo → TPP	0.427	4.835	1.971	0.002	Positive and significant

Table 9: Recapitulation of indirect influence test results

Variable	Path coefficient	t value	t table	*p*-value	Conclusion
CL → Mo → TPP	0.643	9.649	1.971	0.000	Positive and significant
SE → Mo → TPP	0.539	8.794	1.971	0.002	Positive and significant
AS → Mo → TPP	0.683	10.839	1.971	0.002	Positive and significant

Table 10: Recapitulation of the results of the indirect simultaneous effect test

Variable	f value	f table	*p*-value	Conclusion
CL, SE, AS → Mo → TPP	39.835	9.649	0.000	Positive and significant

5. Discussion

Principal change leadership has a direct and significant influence on teacher performance, where an effective leadership style can increase teacher productivity and work enthusiasm, especially teacher pedagogical performance (Edi & Sudadio, 2023). In addition, change leadership implemented by the principal has also been

shown to contribute significantly to teacher pedagogical performance in schools (Pambudi & Gunawan, 2020). The positive relationship between principal leadership and teacher performance emphasises the importance of leaders' role in creating a conducive work environment (Martini et al., 2024). Supportive and motivating leadership can encourage teachers to achieve more optimal educational goals (Mahdi et al., 2025).

Structured and consistent academic supervision has been shown to have a significant influence on increasing teacher pedagogical performance, both individually and collectively (Mustahyi et al., 2021). Optimal implementation of academic supervision can help teachers develop teaching skills and improve the quality of learning in the classroom (Edi & Sudadio, 2023). Academic supervision also acts as a tool to improve teachers' ability to plan, implement, and evaluate the learning process (Martini et al., 2024). With effective supervision, teachers feel more supported and motivated to improve their performance.

Self-efficacy, or teachers' self-confidence in their abilities, has a strong relationship with teacher pedagogical performance, where high levels of self-efficacy encourage teachers to be more innovative and effective in teaching (Puspitasari et al., 2024). The reciprocal relationship between teacher leadership and self-efficacy shows that increasing self-efficacy can strengthen educational practices and student learning outcomes (Mifsud, 2024). Self-efficacy is also an important predictor in determining the level of teacher performance in schools. Teachers who have high self-efficacy tend to be more confident in facing challenges and adapting to change (Akman, 2021).

Work motivation, both within the teacher and with the support of the principal, contributes significantly to improving teacher pedagogical performance. High achievement motivation in teachers can encourage them to continue to improve their competence and work results (Edi & Sudadio, 2023; Firmansyah et al., 2025). Motivational support from the principal has also been shown to have a stronger influence than academic supervision in improving teacher pedagogical performance (Armiati et al., 2025). With optimal motivation, teachers are more enthusiastic in carrying out their duties and responsibilities at school.

Change leadership has been shown to have a significant influence on teacher pedagogical performance, both directly and through work motivation as a mediator (Mifsud, 2024). Research shows that effective leadership can increase teacher work motivation, which ultimately has a positive impact on teacher pedagogical performance (Tajudin et al., 2021). In addition, the results of the study Sudarman et al., (2021) revealed that change-orientated leadership contributes greatly to improving teacher performance, with work motivation playing a determining factor in strengthening this relationship. Supportive and inspiring leadership can create a work environment that motivates teachers to work more optimally (Rasidinurahmad et al., 2022).

Teacher self-efficacy has a direct effect on teacher pedagogical performance, with work motivation as a mediator that strengthens the relationship (Anawati & Mahayasa, 2023). Teachers who have high self-efficacy tend to be more motivated in carrying out their duties, thus having an impact on improving performance (Westbrook & Peterson, 2022). Other studies have also found that self-leadership, which is closely related to self-efficacy, can increase teacher work motivation and indirectly improve their performance (Hattari & Ariyanto, 2023). Work motivation is an important bridge connecting self-efficacy with better teacher performance.

The principal's academic supervision has a significant effect on teacher pedagogical performance, both directly and through work motivation as an intermediary variable (Palupiningsih et al., 2021). Research shows that effective academic supervision can increase teacher work motivation, which ultimately has a positive impact on their performance (Saine et al., 2023). In addition, the combination of academic supervision and work motivation has been shown to have a greater impact on improving teacher performance than if only one factor is improved (Irhan et al., 2021). Structured and ongoing supervision can motivate teachers to continue to improve the quality of learning (Edi et al., 2024).

Change leadership, academic supervision, and self-efficacy have been proven to have a positive effect simultaneously on teacher pedagogical performance, where work motivation plays an important mediator in this relationship (Satria et al., 2024). Research shows that effective principal leadership can increase teacher work motivation, which ultimately has a significant impact on improving their performance (Martono & Prihatin,

2021). Structured academic supervision also contributes greatly to building teacher work motivation, thus encouraging collective performance improvement (Rusdiana et al., 2022). In addition, high teacher self-efficacy, supported by good organisational culture and leadership, strengthens work motivation and leads to more optimal performance (Supriyatna et al., 2023). These findings emphasise the importance of strategic interventions in the areas of leadership, supervision, and strengthening self-efficacy to maximise work motivation and teacher pedagogical performance.

Author Contributions: All authors contributed to this research**.**

Funding: This research received no external funding

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

Informed Consent Statement/Ethics approval: Not applicable.

Acknowledgments: Our gratitude goes to the Principal and all teachers of State Junior High Schools in Cilegon City who have given permission to conduct research at the school. Our gratitude also goes to all parties who have helped in this research that we cannot mention one by one.

Declaration of Generative AI and AI-assisted Technologies: This study has not used any generative AI tools or technologies in the preparation of this manuscript.

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