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Academic Supervision and Teachers' Pedagogical Competencies: Their Impact on Learning Quality in Indonesian Primary Schools.

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Abstract

Quality education in primary schools faces persistent challenges, particularly regarding the role of academic supervision and pedagogical competencies in learning outcomes. This study aims to examine the individual and combined effects of academic supervision and teachers' pedagogical competencies on learning quality in Indonesian primary schools. A quantitative survey using ex post facto correlational design was conducted with 110 primary school teachers from 10 schools in Gugus Bawana Ageng, Tembalang District, Semarang City, selected through proportionate random sampling. Data were collected using validated questionnaires and analyzed through descriptive statistics, correlation analysis, and multiple regression. Results reveal strong positive correlations between academic supervision and learning quality ($r = 0.749$) and pedagogical competence and learning quality ($r = 0.619$). Academic supervision contributed 56.1% to learning quality variance, while pedagogical competence contributed 38.3%. Combined, both variables explained 67.1% of learning quality variance ($R^2 = 0.671$). The study concludes that academic supervision demonstrates stronger predictive power than pedagogical competence in determining learning quality. Implications suggest prioritizing structured supervisory systems and targeted teacher development programs. Future research should explore longitudinal relationships and investigate the remaining unexplained variance through mixed-methods approaches.

Keywords: Academic Supervision, Learning Quality, Pedagogical Competences, Primary Education, Teacher Professional Development

1. Introduction

Research consistently demonstrates a strong correlation between teaching quality and student learning outcomes. Quality teaching, characterized by teachers' self-efficacy, subject knowledge, and communication skills, directly impacts student learning outcomes ([1]). Strong teacher-student interactions, characterized by effective communication and flexible instructional approaches, boost learner engagement and active participation ([2]). Professional development programs for educators lead to improved academic outcomes by strengthening their pedagogical skills and ability to manage

classroom environments ([3]). Educational researchers advocate for transitioning from instructor-focused to learner-centered pedagogical models to enhance educational quality ([4]). This learner-centered approach integrates engaging instructional methods with assessment practices, creating an active and responsive educational setting. Collectively, this body of research highlights the essential importance of strategic teaching practices, continuous educator development, and student-focused methodologies in maximizing learning achievements and elevating educational standards.

The definition of learning quality as a systemic relationship among educational components is well articulated by various scholars. The effectiveness of teaching activities is pivotal in reaching learning objectives, as highlighted by [5], who discusses the potential benefits perceived by school teachers regarding improved outcomes through structured teaching and learning activities. Moreover, [6] emphasize the need for varied instructional methods to enhance student engagement and learning interest, crucial elements in effective teaching. These findings align with the notion that optimized learning environments through a well-structured curriculum and diverse teaching strategies can significantly enhance the overall quality of education.

Considering the specific context of primary education, there is evident room for improvement in various dimensions of learning quality in specific clusters. While existing methods contribute to student engagement, weaknesses remain in the adherence to systematic pedagogical frameworks that cater to diverse learning styles and needs ([7]). Effective teaching practices, such as active learning and cooperative learning, are essential for fostering academic achievement and positive student attitudes ([8]). In particular, addressing the challenges faced by teachers in their delivery methods can significantly mitigate issues related to superficial learning, which often detracts from students' true educational potential ([9]).

This study is grounded in Glickman's Developmental Supervision Theory ([10]), which posits that effective supervision should be tailored to individual teacher needs and developmental stages. The theory emphasizes three supervisory approaches: directive, collaborative, and non-directive, depending on teachers' levels of commitment, abstraction, and expertise. Additionally, the study draws upon [11] Pedagogical Content Knowledge (PCK) framework, which identifies seven categories of teacher knowledge essential for effective instruction, including content knowledge, pedagogical knowledge, and knowledge of learners and their characteristics. These theoretical foundations provide a comprehensive lens for understanding how supervisory practices interact with teacher competencies to influence learning outcomes. The integration of these frameworks offers a robust theoretical foundation for examining the complex relationships between academic supervision, pedagogical competencies, and learning quality in educational settings ([12]).

Data from Data Pokok Pendidikan (DAPODIK) shows 10 primary schools in Gugus Bawana Ageng, Tembalang District, consisting of 6 public primary schools and four private primary schools ([13]). The 2024 education report shows improvement in several aspects, but the quality of education has stagnated and even declined in some areas. Analysis of learning quality data from 2023 to 2024 reveals concerning trends across the cluster schools. The learning quality scores range from moderate to good categories, with only three schools achieving good performance levels: SD Sendangmulyo 03, SD Islam Tunas Harapan, and SD Al Azam.

Several schools experienced significant declines in learning quality between 2023 and 2024. SD Islamadina showed a notable decrease from 64.76 to 59.43, while SD Negeri Sendangmulyo 01 declined from 73.23 to 63.17. Similarly, SD Negeri Sendangmulyo 02 dropped from 69.26 to 65.76. Conversely, some schools demonstrated improvement, such as SDN Rowosari 01, which increased from 59.95 to 67.25, and SD Islam Tunas Harapan, which improved from 68.44 to 73.84. Despite these mixed results, the overall trend indicates that seven out of ten schools maintain only moderate learning quality levels, highlighting the need for systematic interventions to enhance educational outcomes

across the cluster.

Academic supervision plays an essential role in enhancing the quality of education by supporting teachers in their professional development and the effective management of the learning process to meet educational objectives ([14]). This supervisory function is crucial for school leaders, particularly principals, as they are tasked with creating optimal learning environments and ensuring that educators are well-prepared to deliver high-quality instruction. According to several studies, academic supervision is characterized as a series of activities intended to help educators refine their skills in managing the learning process effectively ([15]; [16]; [17]).

At Gugus Bawana Ageng Primary Schools in Tembalang District, however, the implementation of academic supervision has faced significant challenges. The current supervisory practices are largely procedural and lack meaningful engagement with teachers. Academic supervision is sometimes conducted merely to fulfill administrative requirements, resulting in a superficial process that does not involve teachers in its planning or execution ([16]; [18]). The findings suggest that the absence of structured planning and follow-up actions renders the supervision ineffective, failing to address teachers' specific needs or develop their competencies. This trend of inadequate supervision practices reflects a broader issue of administrative compliance overshadowing genuine educational development ([19]; [16]).

The expectations outlined in the Law of the Republic of Indonesia Number 14 of 2005 emphasize that teacher competence, particularly in pedagogical skills, significantly influences the quality of education delivered ([20]). Pedagogical competence is defined as the ability of educators to foster diverse learning experiences, understand student needs, and manage classroom dynamics effectively ([21]; [22]; [23]). Unfortunately, a survey conducted among 50 primary school teachers at Gugus Bawana Ageng revealed that many teachers do not possess sufficient pedagogical competence. They struggle with developing lesson plans and learning objectives independently, which is critical for enhancing student engagement and learning outcomes ([24]).

The preliminary survey results indicate significant gaps in teachers' pedagogical competencies across multiple dimensions. The findings reveal that seventy-five percent of teachers only sometimes develop teaching materials independently, while twenty-five percent never engage in this critical practice. Regarding student assessment, forty-five percent of teachers never conduct initial assessments to determine student characteristics, and thirty percent do so only sometimes. The situation is more concerning regarding assessment tool development, where fifty percent of teachers never create their own assessment instruments, and forty percent do so only occasionally. In terms of instructional aids, thirty percent of teachers never utilize appropriate teaching aids in their lessons, while forty-five percent use them only sometimes. The implementation of differentiated learning presents the most significant challenge, with seventy percent of teachers only sometimes adapting their instruction according to student learning profiles, and thirty percent never implementing this essential pedagogical practice.

This lack of pedagogical proficiency can be attributed to several factors, including the absence of constructive feedback from academic supervision. The current practices do not provide teachers with actionable insights or support to advance their instructional methods ([25]; [26]). Consequently, supervision has become a cyclical process that fails to lead to sustainable improvements in teaching quality, as teachers often revert to their previous teaching methods after supervision sessions ([27]; [28]; [29]). Effective academic supervision should not only evaluate teacher performance but also equip educators with the tools and strategies necessary for continuous improvement ([30]).

To transform academic supervision into a more beneficial practice, it is essential that principals engage teachers in both the planning and evaluation of supervision processes. By establishing a collaborative approach to supervision, school leaders can ensure that it becomes a supportive mech-

anism that meets the professional development needs of teachers ([31]; [32]). Effective supervision is most impactful when it is tailored to the context and needs of educators and involves consistent follow-up to track progress towards specific teaching goals ([33]; [34]). Through such reforms, the potential for enhancing teacher competencies and ultimately improving educational quality within the Gugus Bawana Ageng Primary School cluster can be realized.

Given the critical challenges facing elementary education in the Gugus Bawana Ageng cluster, particularly the stagnating learning quality and identified gaps in both supervisory practices and teacher competencies, this study addresses the urgent need to understand the relationship between academic supervision and teachers' pedagogical competencies in determining learning quality outcomes. Specifically, this research seeks to answer the following questions:

1. To what extent does academic supervision influence learning quality in Indonesian primary schools?
2. How do teachers' pedagogical competencies affect learning quality outcomes in primary education settings?
3. What is the combined effect of academic supervision and pedagogical competencies on learning quality, and how do these variables interact to enhance educational outcomes?

The research fills a significant gap in the literature by examining how these two crucial educational components work individually and collectively to influence learning quality in Indonesian elementary schools. This investigation is particularly important as it provides empirical evidence that can inform policy decisions and practical interventions to enhance educational quality in similar educational contexts. The study's findings contribute to the broader understanding of effective educational leadership and teacher development strategies necessary for improving elementary education outcomes, particularly within the Indonesian educational landscape where systemic improvements in supervision practices and teacher professional development are critically needed.

2. Methods

This study employed a quantitative approach using an ex post facto correlational design to examine the relationships between academic supervision (X1), pedagogical competence (X2), and learning quality (Y). The study was conducted in Gugus Bawana Ageng, Tembalang District, Semarang City, involving 110 primary school teachers selected from a population of 152 teachers across 10 schools using proportionate random sampling. The sample size was determined using the Slovin formula with a 5% significance level

Data were collected using three questionnaires measuring the research variables. The Academic Supervision questionnaire measured supervision planning, implementation, and evaluation. The Pedagogical Competence questionnaire covered mastering student characteristics, planning learning, implementing learning, and conducting assessment. The Learning Quality questionnaire measured quality learning, learning effectiveness, and educator learning behavior. All instruments used a 5-point Likert scale.

Prior to data collection, instruments underwent validity and reliability testing with 30 teachers. Validity was assessed using Pearson product-moment correlation with $r = 0.361$ as the criterion. Several items were found invalid and removed: item 38 from Learning Quality ($r = 0.153$), item 8 from Academic Supervision ($r = 0.256$), and items 37 and 48 from Pedagogical Competence ($r = 0.119$ and $r = 0.254$, respectively).

Reliability testing using Cronbach's alpha showed excellent internal consistency: Academic Supervision ($\alpha = 0.988$), Pedagogical Competence ($\alpha = 0.989$), Learning Quality ($\alpha = 0.982$), and Collaborative Culture ($\alpha = 0.980$), all exceeding the minimum threshold of 0.60. Data analysis was performed using SPSS version 26.0. Prerequisite tests at a 0.05 significance level.

3. Results and Discussion

3.1 Results

Descriptive Statistics

The descriptive statistical analysis of the research variables Academic Supervision (X1), Pedagogical Competence (X2), and Primary School Learning Quality (Y) are presented in Table 1

Table 1. Descriptive Analysis

	Learning Quality	Academic Supervision	Pedagogical Competence
N	110	110	110
Valid			
Missing	0	0	0
Mean	156.96	174.35	189.58
Std. Error of Mean	1.779	1.990	2.739
Median	155.00	176.00	191.00
Variance	348.237	435.696	824.961
Range	70	93	126
Minimum	121	127	114
Maximum	191	220	240
Sum	17266	19178	20854

Based on Table 1, the learning quality variable (39 items) obtained scores ranging from 121 to 191 with a mean of 156.96. Academic supervision (44 items) scored between 127 and 220 with a mean of 174.35. Pedagogical competence (48 items) ranged from 114 to 240 with a mean of 189.58. All variables showed normal distribution patterns based on the mean and median values.

Factor Analysis Results

Learning Quality Variable Indicators

Table 2. Factor Analysis of Primary School Learning Quality Variables

	Initial	Extraction
Quality learning	1.000	0.207
Learning effectiveness	1.000	0.749
Educator learning behaviour	1.000	0.575
Extraction Method: Principal Component Analysis.		

The factor analysis reveals that learning effectiveness (.749) contributes most significantly to learning quality, followed by educator learning behavior (.575), while quality learning factor shows the lowest contribution (.207).

Academic Supervision Variable Indicators

Table 3. Factor Analysis of Academic Supervision Variables

	Communalities	Initial	Extraction
Supervision Planning	1.000	0.891	
Supervision Implementation	1.000	0.811	
Evaluation and follow-up	1.000	0.754	
Extraction Method: Principal Component Analysis.			

Based on Table 3 above, Supervision planning (.891) emerges as the most influential factor in academic supervision, followed by supervision implementation (.811) and evaluation and follow-up (.754).

Pedagogical Competence Variable Indicators

Table 4. Factor Analysis of Pedagogical Competency Indicators

	Communalities	Initial	Extraction
Mastering Students Characteristics	1.000	0.852	
Ability to Plan Learning Module	1.000	0.833	
Ability to Implement Learning	1.000	0.757	
Ability to Conduct Assessment	1.000	0.812	
Extraction Method: Principal Component Analysis.			

Based on Table 4 above, Mastering student characteristics (.852) shows the highest contribution to pedagogical competence, followed by ability to plan learning (.833), ability to conduct assessment (.812), and ability to implement learning (.757).

Correlation Analysis

Table 5. Correlation Analysis between Academic Supervision and Learning Quality

Correlations			
		Learning Quality	Academic Supervision
Learning Quality	Pearson Correlation	1	.749**
	Sig. (2-tailed)		.000
	N	110	110
Academic Supervision	Pearson Correlation	.749**	1
	Sig. (2-tailed)	.000	
	N	110	110

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis reveals a strong positive relationship between academic supervision and learning quality ($r = .749$, $p < .001$), indicating that improvements in academic supervision practices are associated with enhanced learning quality.

Table 6. Correlation Analysis between Pedagogical Competences and Learning Quality

Correlations				
		Learning Quality	Pedagogical Competences	Competences
Learning Quality	Pearson Correlation	1	.619**	
	Sig. (2-tailed)		.000	
	N	110	110	
Pedagogical Competences	Pearson Correlation	.619**	1	
	Sig. (2-tailed)	.000		
	N	110	110	

** . Correlation is significant at the 0.01 level (2-tailed).

A significant positive correlation exists between pedagogical competence and learning quality ($r = .619$, $p < .001$), demonstrating that teachers with higher pedagogical competence contribute to better learning outcomes.

Regression Analysis

Simple Regression: Academic Supervision on Learning Quality

Table 7. ANOVA Results – Academic Supervision Effect on Learning Quality

ANOVA ^a					
Model		Sum of Squares	df	Mean Square	F Sig.
1	Regression	21309.940	1	21309.940	138.244 .000 ^b
	Residual	16647.915	108	154.147	
	Total	37957.855	109		

^aDependent Variable: Learning Quality
^bPredictors: (Constant), Academic Supervision

Based on Table 6, the results of the ANOVA test of academic supervision on the quality of primary school learning show that the calculated F value is 138.244, which is greater than the F table value at a confidence level of 0.05, which is 2.62.

Table 8. Model Summary – Academic Supervision Effect

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.749 ^a	.561	.557	12.416

^aPredictors: (Constant), Academic Supervision

Table 9. Regression Coefficients – Academic Supervision

Coefficients ^a					
		Unstandardized		Standardized	
Model		B	Std. Error	Beta	t Sig.
1	(Constant)	40.176	10.003		4.016 .000
	Academic Supervision	0.670	0.057	.749	11.758 .000

^aDependent Variable: Learning Quality

The regression analysis shows that academic supervision significantly predicts learning quality ($F = 138.244$, $p < .001$), explaining 56.1% of the variance in learning quality ($R^2 = .561$). The regression equation is: $Y = 40.176 + 0.670X_1$

Simple Regression: Pedagogical Competence on Learning Quality

Table 10. ANOVA Results – Pedagogical Competence Effect on Learning Quality

Model	ANOVA ^a				
	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	14526.073	1	14526.073	66.952	.000 ^b
Residual	23431.782	108	216.961		
Total	37957.855	109			

^aDependent Variable: Learning Quality
^bPredictors: (Constant), Pedagogical Competences

Table 11. Model Summary – Pedagogical Competence Effect

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.619 ^a	.383	.377	14.730

^aPredictors: (Constant), Pedagogical Competences

Table 12. Regression Coefficients – Pedagogical Competences

Model	Coefficients ^a				
	Unstandardized		Standardized		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	80.766	9.418		8.576	.000
Pedagogical Competences	0.402	0.049	.619	8.182	.000

^aDependent Variable: Learning Quality

Pedagogical competence significantly predicts learning quality ($F = 66.952$, $p < .001$), accounting for 38.3% of the variance ($R^2 = .383$). The regression equation is: $Y = 80.766 + 0.402X_2$

Multiple Regression Analysis

The multiple regression analysis demonstrates that both academic supervision and pedagogical competence together significantly predict learning quality ($F = 75.230$, $p < .001$). The combined model explains 68.0% of the variance in learning quality ($R^2 = .680$), with the adjusted R^2 of 67.1%. The final regression equation is: $Y = 19.007 + 0.286X_1 + 0.126X_2$. Both predictors make significant unique contributions to learning quality: academic supervision ($\beta = .319$, $t = 3.613$, $p < .001$) and pedagogical competence ($\beta = .193$, $t = 2.777$, $p < .01$). Academic supervision shows a stronger predictive power compared to pedagogical competence in the combined model.

Table 13. ANOVA Results – Combined Effects of Academic Supervision and Pedagogical Competence

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25827.409	3	8609.136	75.230	.000 ^b
	Residual	12130.445	106	114.438		
	Total	37957.855	109			

^aDependent Variable: Learning Quality

^bPredictors: (Constant), Collaborative Culture, Pedagogical Competences, Academic Supervision

Table 14. Model Summary – Combined Effects

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.825 ^a	.680	.671	10.698

^aPredictors: (Constant), Collaborative Culture, Pedagogical Competences, Academic Supervision

Table 15. Regression Coefficients – Combined Effects

		Coefficients ^a				Sig.
		Unstandardized		Standardized		
Model		B	Std. Error	Beta	t	
1	(Constant)	19.007	9.254		2.054	.042
	Academic Supervision	0.286	0.079	.319	3.613	.000
	Pedagogical Competences	0.126	0.045	.193	2.777	.006
^a Dependent Variable: Learning Quality						

3.2 Discussion

Theoretical Framework and Interpretation of Findings

The findings of this study provide substantial empirical evidence supporting the pivotal role of academic supervision in enhancing primary school learning quality, which aligns with contemporary educational theories. The stronger predictive power of academic supervision ($\beta = .319$) compared to pedagogical competence ($\beta = .193$) in the combined model can be theoretically explained through Bandura’s Social Cognitive Theory, which emphasizes the triadic reciprocal causation between personal factors, behavioral patterns, and environmental influences [35]). Academic supervision represents the environmental component that actively shapes teacher behavior through modeling, feedback, and social learning processes, making it a more immediate and controllable factor in educational improvement than individual teacher competencies.

This theoretical interpretation is further supported by recent research indicating that academic supervision functions as a catalyst that activates and amplifies existing pedagogical competencies rather than merely assessing them ([36]). The Social Cognitive Theory’s concept of self-efficacy provides additional insight into why supervision yields stronger effects: supervisory practices enhance teachers’ confidence in their abilities through mastery experiences, vicarious learning, and verbal persuasion the three primary sources of self-efficacy according to ([37]). When teachers observe effective teaching models during supervision and receive constructive feedback, their self-efficacy beliefs are strengthened, leading to improved performance that extends beyond their initial competency levels.

Why Academic Supervision Demonstrates Greater Predictive Power

The superior predictive power of academic supervision over pedagogical competence can be understood through several theoretical mechanisms. First, the agency effect: Academic supervision creates an immediate external agency that guides teacher behavior, while pedagogical competence represents static individual capabilities that may remain dormant without proper activation ([38]). As demonstrated in recent studies, supervision acts as a "triggering mechanism" that transforms potential competencies into actual teaching behaviors ([39]).

Second, the systematic intervention effect: Unlike pedagogical competence, which develops gradually over time, academic supervision provides structured, systematic interventions that directly address specific teaching challenges. Research by [40] supports this finding, showing that clinical supervision approaches significantly improved managerial competence through targeted interventions. The current study's factor analysis revealing supervision planning as the most influential component (0.891) reinforces this systematic approach's importance.

Third, the social learning amplification effect: Academic supervision leverages social learning processes more effectively than individual competencies. Through observational learning and modeling, supervision creates learning opportunities that transcend individual teacher limitations ([41]). This aligns with findings from [42] who demonstrated that collaborative supervision approaches significantly enhanced professional learning communities' effectiveness.

Comparative Analysis with Previous Research

The study's findings show remarkable consistency with international research while revealing some unique patterns. The correlation coefficient between academic supervision and learning quality ($r = 0.749$) surpasses most previous studies, including [43] who reported $r = 0.741$, and significantly exceeds [44] findings of 34% variance explanation. This stronger correlation in the current study may be attributed to the comprehensive measurement of supervision planning, implementation, and follow-up components often overlooked in previous research.

However, the pedagogical competence correlation ($r = 0.619$) presents an interesting contrast with international findings. While this correlation is substantial, studies from Western contexts typically report stronger relationships between teacher competence and student outcomes ([12]). This discrepancy may reflect the specific challenges identified in the preliminary survey, where 75% of teachers only sometimes develop teaching materials independently, suggesting that pedagogical competence in this context requires external activation through supervision to become effective.

The combined variance explanation of 67.1% represents a significant advancement over previous studies. [45] found that supervision alone explained 69.4% of pedagogical competence variance, while our study demonstrates that the combination of both factors explains 67.1% of learning quality variance directly indicating a more efficient predictive model.

Theoretical Integration: Social Cognitive Theory and Educational Supervision The study's findings can be effectively interpreted through Bandura's Social Cognitive Theory framework, particularly the concepts of reciprocal determinism and self-regulation. Academic supervision serves as the environmental component that influences personal factors (teacher beliefs and self-efficacy) and behavioral patterns (teaching practices) simultaneously ([46]). This triadic influence explains why supervision demonstrates such strong predictive power it operates on multiple levels of the learning system concurrently.

The factor analysis results further support this theoretical integration. Supervision planning emerged as the most critical factor (0.891), which aligns with Social Cognitive Theory's emphasis on forethought and goal-setting as fundamental to self-regulation ([47]). When supervisors engage in systematic planning, they create clear behavioral models and outcome expectations that guide teacher

development a process consistent with the theory's emphasis on observational learning and outcome expectancies.

The finding that mastering student characteristics is the primary pedagogical competence factor (0.852) reflects the Social Cognitive Theory's emphasis on understanding environmental factors (student needs and characteristics) as essential for effective behavioral adaptation (teaching strategies). This connection between environmental awareness and behavioral effectiveness demonstrates how pedagogical competence operates within the social cognitive framework.

Addressing Implementation Challenges Through Theoretical Lens

The study identified significant challenges in current supervisory practices, particularly the lack of meaningful engagement and follow-up. These challenges can be understood through Social Cognitive Theory's concept of sustained behavioral change, which requires ongoing reinforcement and modeling rather than sporadic interventions ([41]). The finding that many schools conduct supervision merely for administrative compliance reflects a fundamental misunderstanding of supervision as a social learning process.

Recent research by [48] demonstrated that continuous supervisory support significantly improved teacher professional well-being and classroom quality, supporting the current study's emphasis on systematic follow-up. The theoretical implication is that supervision must be reconceptualized from an evaluative process to a social learning partnership that continuously reinforces effective teaching behaviors through modeling, feedback, and collaborative reflection.

Implications for Educational Practice and Policy

The stronger predictive power of academic supervision suggests that educational investments should prioritize supervisory system development over isolated teacher training programs. This finding aligns with the Social Cognitive Theory's emphasis on environmental modification as a more effective approach to behavioral change than individual skill development alone ([46]). The study's theoretical contributions extend beyond the immediate context by demonstrating how social learning principles can be systematically applied to educational supervision. The identification of supervision planning as the most critical factor provides a clear direction for policy development: effective supervision requires structured planning that incorporates goal-setting, behavioral modeling, and outcome monitoring all key components of Social Cognitive Theory applications in educational settings.

Future Research Directions and Theoretical Extensions

The remaining 32.9% of unexplained variance suggests several avenues for future research within the Social Cognitive Theory framework. Potential factors include teacher self-regulation capabilities, collective efficacy beliefs, and social persuasion effectiveness all core components of Bandura's theory that warrant investigation in educational supervision contexts.

Future studies should examine the temporal dynamics of supervision effects, investigating how the relationship between supervision and learning quality evolves over time. Social Cognitive Theory suggests that self-efficacy beliefs and behavioral changes follow predictable developmental patterns that could inform optimal supervision timing and intensity.

Additionally, research should explore cultural adaptations of supervision models, particularly how social learning processes vary across different cultural contexts. The current study's Indonesian context may require supervision approaches that differ from Western models, reflecting cultural variations in social learning preferences and authority relationships.

4. Conclusion

This study provides substantial evidence supporting the significant influence of academic supervision and teachers' pedagogical competencies on learning quality in primary schools. The research successfully confirms all three hypotheses through quantitative analysis involving 110 primary school teachers in Gugus Bawana Ageng, Tembalang District. Academic supervision demonstrates a strong positive correlation with learning quality ($r = 0.749$), contributing 56.1% to variance in learning outcomes, while pedagogical competence shows significant correlation ($r = 0.619$), accounting for 38.3% of variance. The combined effect accounts for 67.1% of learning quality variance ($R^2 = 0.671$), with supervision planning (0.891) and mastery of student characteristics (0.852) emerging as the most influential factors. The findings address the stagnation in learning quality where only three out of ten schools achieved good ratings, demonstrating that both variables are essential determinants of primary school learning quality. This research contributes significantly to educational leadership theory by providing empirical evidence of the interconnected relationship between supervisory practices and teacher competencies in Indonesian contexts, extending theoretical frameworks beyond administrative compliance to critical educational quality mechanisms. From a policy perspective, the findings offer evidence-based recommendations for restructuring academic supervision systems and informing national/regional education policies regarding teacher supervision standards and professional development requirements.

Several limitations should be acknowledged in interpreting these findings. The study's exclusive focus on one educational cluster in Tembalang District, Semarang City, may limit generalizability to other contexts, while the cross-sectional design prevents establishment of causal relationships. The reliance on self-reported questionnaire data may introduce social desirability bias and not fully capture the complexity of actual supervisory practices and teaching competencies. Additionally, the unexplained 32.9% variance suggests other important factors (school infrastructure, student socioeconomic backgrounds, parental involvement) were not examined, and the absence of longitudinal classroom observations limits understanding of supervision mechanisms. Educational leaders should prioritize developing effective supervisory systems with structured planning, implementation, and follow-up phases, combined with targeted teacher professional development programs. Future research should conduct longitudinal studies to establish causal relationships, explore the remaining unexplained variance factors, and employ comparative studies across different educational contexts with mixed-methods approaches incorporating classroom observations to provide deeper insights into supervisory processes and their impact on educational outcomes.

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