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THE INFLUENCE OF ACADEMIC SUPERVISION, LEARNING COMMUNITIES, AND COLLABORATIVE LEADERSHIP OF PRINCIPALS ON THE QUALITY OF LEARNING IN PUBLIC ELEMENTARY SCHOOLS

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Abstract

This study aims to examine the influence of academic supervision, learning communities, and collaborative leadership on the quality of learning in public elementary schools in Mijen District, Semarang City. The research employed a quantitative approach with regression analysis to test the proposed hypotheses. Primary data were collected through structured questionnaires and interviews with 147 teachers and principals, ensuring direct insights from practitioners about the dynamics of supervision, collaboration, and learning quality. Secondary data were obtained from school documents, official education reports, and relevant policy guidelines, which provided contextual support and validation for the primary findings. The analysis results demonstrate that academic supervision has a significant effect on improving learning practices, though planning dimensions require further strengthening. Learning communities contribute substantially by fostering professional collaboration and reflective practice, while collaborative leadership shows a moderate but meaningful impact in building supportive and goal-oriented school cultures. Together, these three variables explain 77.3% of the variation in learning quality, with the remaining 22.7% influenced by external factors such as teacher motivation, parental involvement, and institutional policies. The findings highlight the need for integrative strategies that combine structured supervision, active learning communities, and collaborative leadership to create a sustainable ecosystem for quality education. This study contributes to the broader discourse on school improvement by emphasizing the synergy between supervision, collaboration, and leadership in enhancing teaching and learning outcomes.

Keywords

Academic Supervision, Collaborative Leadership, Learning Community, Learning Quality, Primary Education.

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INTRODUCTION

Education is widely recognized as a fundamental driver of national development, as mandated in the Indonesian National Education System Law No. 20 of 2003, which emphasizes the role of education in cultivating the intellectual and moral capacity of citizens (Mahmudah & Putra, 2021; Kenmandola, 2022). To achieve this, the government has introduced various strategic programs, including the National Assessment (Asesmen Nasional), which evaluates literacy, numeracy, and character education (Fiskha et al., 2022; Syamsuddin & Harianto, 2023). The results are presented in the Education Report (Rapor Pendidikan), which functions as a diagnostic tool for schools and policymakers to identify strengths and weaknesses across key dimensions of educational quality (Anwar et al., 2022; Ambawani et al., 2024).

Despite these efforts, a persistent gap remains between the ideals of quality learning and the realities observed in schools. National Education Reports from several elementary schools in Mijen District indicate that while some progress has been made, the dimension of teaching quality and relevance (Dimension D) has stagnated or even declined in many cases. Teachers frequently rely on traditional lecture-based methods, and school principals often conduct academic supervision merely as an administrative formality rather than as meaningful professional guidance (Kholil & Harahap, 2023; Fahmi Addini et al., 2022). This disconnect highlights the tension between theoretical expectations of effective pedagogy and the practical implementation in classrooms.

Recent studies have consistently demonstrated that academic supervision, teacher learning communities, and collaborative leadership are among the most influential factors in improving learning quality. Yuningsih et al. (2024) and Tamim Mulloh & Muslim (2022) emphasizes that well-structured academic supervision enhances teachers' pedagogical competence, while Mastuti et al. (2022) stresses its role in supporting student-centered learning. Furthermore, teacher learning communities have been shown to provide spaces for reflection, knowledge sharing, and collective problem-solving, yet their implementation remains limited and often superficial (Pribadi et al., 2023; Supardi U.S. & Henhen Herdiana, 2024). Similarly, collaborative leadership, where school principals engage teachers in participatory decision-making and foster professional trust, has been proven effective in shaping inclusive and innovative learning environments (Masruhin et al., 2022; Rachman et al., 2023) However, most of these studies were conducted in broader educational contexts and did not specifically address the dynamics of elementary schools in Mijen District. The gap lies in the fact that while previous research highlights the importance of supervision, collaboration, and leadership

in general, little is known about how these factors simultaneously interact and influence learning quality in the unique context of local public elementary schools. This study, therefore, seeks to fill that gap by examining the integrated impact of academic supervision, teacher learning communities, and collaborative leadership on learning quality in Mijen District, thereby providing both theoretical refinement and practical implications for school improvement.

In Mijen District, Education Reports (*Rapor Pendidikan*) reveal that the quality and relevance of learning (Dimension D) remain stagnant, with many schools experiencing a decline. Academic supervision is often limited to administrative checks without meaningful professional guidance, teacher learning communities function more as formalities than spaces for reflection, and collaborative leadership by principals is inconsistently applied. These realities highlight a mismatch between the ideals of effective pedagogy and the actual practices in schools, raising concerns about the sustainability of learning improvement.

Positioned within this context, this study examines the influence of academic supervision, teacher learning communities, and collaborative leadership on learning quality in public elementary schools in Mijen District. Theoretically, it contributes to educational management discourse by bridging gaps between leadership, professional development, and instructional quality. Practically, it provides evidence-based insights for principals, teachers, and education authorities to design interventions that enhance learning quality in alignment with national education goals.

METHOD

This study employed a quantitative approach with an explanatory survey design to examine the relationship between academic supervision, teacher learning communities, and collaborative leadership on the quality of learning in public elementary schools in Mijen District, Semarang (Waruwu et al., 2025; Yam&Taufik, 2021). The quantitative approach was selected to provide measurable evidence of the variables' influence and to test hypotheses statistically (Hardani MSi et al., 2020). The explanatory nature of the design allows the researcher to identify causal relationships between independent variables (academic supervision, teacher learning communities, and collaborative leadership) and the dependent variable (learning quality).

The data were collected through a structured questionnaire distributed to 147 teachers from 24 public elementary schools in Mijen District, with two teachers selected from each school. The population of this study comprised all public elementary school teachers in the district, and the

sample was determined using a total sampling technique to ensure representation across schools. The instrument was developed based on theoretical indicators of each variable: planning, implementation, and follow-up for academic supervision; reflection, sharing of best practices, and collaboration for teacher learning communities; and participatory vision, open communication, and joint decision-making for collaborative leadership. In addition, documentation and official school reports were analyzed to enrich contextual understanding. Primary data consisted of responses from teachers and principals, while secondary data included the National Assessment (Rapor Pendidikan) and relevant school reports from 2023–2024.

The collected data were analyzed using multiple regression analysis to test the extent of influence among the variables (Rizky et al., 2024; Zidane Ardiansyah et al., 2023). Descriptive statistics were first employed to portray the characteristics of the respondents and their perceptions of each variable, followed by inferential statistics to test the hypotheses. The hypotheses of this study are as follows:

1. Academic supervision has a positive and significant effect on the quality of learning.
2. Teacher learning communities have a positive and significant effect on the quality of learning.
3. Collaborative leadership has a positive and significant effect on the quality of learning.
4. Academic supervision, teacher learning communities, and collaborative leadership simultaneously have a positive and significant effect on the quality of learning.

Here is a picture of the research design:

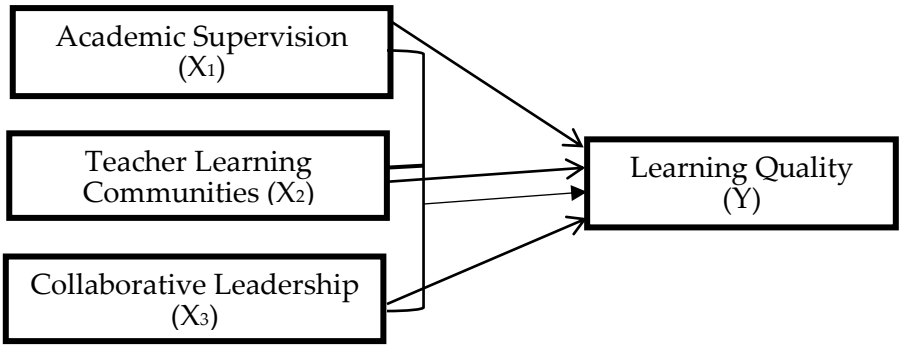

Figure 1. Research Design

This framework reflects the assumption that the quality of learning can be significantly improved when academic supervision is systematically implemented, when teacher learning communities are active and reflective, and when school principals apply collaborative leadership to foster shared responsibility and innovation in the teaching-learning process.

FINDINGS AND DISCUSSION

Findings

1. Descriptive Analysis

` The research findings are based on data collected from 147 public elementary school teachers in Mijen District, Semarang City, through four questionnaires: learning quality, academic supervision, learning community, and collaborative leadership. Descriptive statistical analysis was conducted using SPSS to examine minimum, maximum, mean, and standard deviation values. The results show that the quality of learning (Y) had scores ranging from 128 to 188, with a mean of 160.69, categorized as moderate. Academic supervision (X1) ranged from 91 to 170, with a mean of 137.23, also in the moderate category. Similarly, the learning community (X2) had scores between 89 and 164, with a mean of 128.05, falling into the moderate category. Collaborative leadership (X3) ranged from 89 to 160, with a mean of 126.58, and was also classified as moderate.

Frequency distribution analysis further revealed that most respondents tended to perceive these four variables at the moderate level, with fewer responses in the very low or very high categories. Overall, the findings indicate that the quality of learning, academic supervision, learning communities, and collaborative leadership in public elementary schools in Mijen are generally perceived as moderate, suggesting room for improvement across all aspects.

2. Results of Dimension Testing of Research Variables

The dimension test ensured the validity and reliability of indicators for the four research variables. Results revealed variations in the strength of dimensions within each variable. For learning quality, the effectiveness of learning (0.813) had the strongest contribution, while teacher learning behavior (0.323) was the weakest, indicating a need for greater emphasis on teacher role modeling and holistic character-building. In academic supervision, implementation (0.891) was the strongest, whereas planning (0.613) was the weakest, reflecting the lack of systematic strategies in supervision design.

Similarly, in the learning community, collaborative inquiry (0.870) emerged as the dominant dimension, while shared repertoire (0.387) was weakest, suggesting that teachers were less active in sharing ideas, experiences, and teaching strategies. In collaborative leadership, goal-oriented skills (0.825) and team coordination (0.822) were the strongest, but effective communication

(0.643) was the weakest, highlighting the need for clearer, more structured, and dialogic communication from school leaders.

To provide a clearer overview, the summary of the highest and lowest contributing dimensions is presented in Table 1:

Table 1. The Summary of the Highest and Lowest Contributing Dimensions

Variable	Highest Contributing Dimension	Extraction Value	Lowest Contributing Dimension	Extraction Value	Notes
Learning Quality	Effectiveness of Learning	0.813	Teacher Learning Behavior	0.323	Teacher role modeling and character-building need strengthening.
Academic Supervision	Implementation	0.891	Planning	0.613	Supervision planning is less systematic and needs improvement.
Learning Community	Collaborative Inquiry	0.870	Shared Repertoire	0.387	Teachers share fewer strategies and ideas in professional forums.
Collaborative Leadership	Goal-Oriented Skills	0.825	Effective Communication	0.643	Communication by principals needs to be clearer and more engaging.

This summary highlights that while several dimensions show strong contributions, weaker aspects, particularly teacher behavior, supervision planning, collaborative knowledge-sharing, and communication, require targeted improvement to strengthen overall school quality in Mijen District.

3. Assumption Testing

Assumption testing was conducted to determine whether the variables used meet the required conditions (Mardiatmoko, 2020; Ahyani et al., 2024). The following are the assumption test results:

a. Normality Test

The Kolmogorov-Smirnov normality test was applied to four research variables: learning quality, academic supervision, learning community, and collaborative leadership. Results showed significance values of 0.098, 0.088, 0.071, and 0.093 respectively, all exceeding the threshold of 0.05. These findings indicate that the data from each variable are normally distributed. Therefore, the assumptions for regression analysis were met, ensuring the validity of

further statistical testing and strengthening the reliability of the research results (Silalahi et al., 2024).

b. Linearity Test

The linearity test using ANOVA demonstrated that the relationship between learning quality (Y) and academic supervision (X1), learning community (X2), and collaborative leadership (X3) met the linearity assumption. The significance values of Deviation from Linearity for Y–X1 (0.085), Y–X2 (0.152), and Y–X3 (0.620) were all greater than 0.05. These results indicate that the regression equations between dependent and independent variables are linear, thus fulfilling the assumption required for further regression analysis (Husdi & Dalai, 2023).

c. Multicollinearity Test

The multicollinearity test was conducted using tolerance and VIF values. Results showed that academic supervision (VIF = 3.279; tolerance = 0.305), learning community (VIF = 4.976; tolerance = 0.201), and collaborative leadership (VIF = 2.939; tolerance = 0.340) all had VIF values below 10 and tolerance values above 0.10. These findings indicate no multicollinearity among independent variables, confirming that each predictor is statistically independent and appropriate for further regression and path analysis (Eru Ugi & Armin, 2023).

d. Heteroscedasticity Test

The heteroscedasticity test results showed significance values for academic supervision (0.543), learning community (0.107), and collaborative leadership (0.080), all greater than 0.05. These findings indicate that no heteroscedasticity occurred in the regression model, meaning the residuals had equal variance across observations. This conclusion was also supported by the scatterplot, which displayed data points spread randomly without forming a specific pattern, thereby fulfilling the classical assumption for regression analysis (Astutiningtyas & Kusumaningsih, 2025).

4. Hypothesis Testing

Hypothesis testing was carried out using simple and multiple linear regression analysis to facilitate data analysis (Sugiyanto et al., 2025). All data processing was conducted using SPSS version 21.0 and Microsoft Office Excel 2013. In this study, four hypotheses were tested. Hypotheses 1, 2, and 3 were tested using simple linear regression analysis, while Hypothesis 4 was tested using multiple linear regression analysis. The choice of regression technique was based

on the research objective, namely, to examine the influence of each independent variable both partially and simultaneously on the dependent variable (Alwy Yusuf et al., 2024).

a. Simple Regression

1) Hypothesis 1: The Effect of Academic Supervision on the Quality of Learning in Public Elementary Schools in Mijen District

To interpret the correlation coefficient, the researcher used the following guideline:

Table 2. Interpretation of Correlation Coefficient

Coefficient Interval	Strength of Relationship
0.000–0.199	Very weak
0.200–0.399	Weak
0.400–0.599	Moderate
0.600–0.799	Strong
0.800–1.000	Very strong

Source: Sugiyono (2018:274)

This analysis aimed to determine the extent of the effect of Academic Supervision on Learning Quality. The test was conducted using simple linear regression to examine the relationship between variable X1 and Y. The results of the correlation test of Academic Supervision (X1) on Learning Quality (Y) are presented in Table 3.

Table 3. Correlation Test of X1 on Y

	Learning Quality	Academic Supervision
Learning Quality	1	.814**
Academic Supervision	.814**	1
Sig. (2-tailed) = .000	N = 147	
**. Correlation is significant at the 0.01 level (2-tailed).		
Source: SPSS Output		

Table 3 shows that the correlation between Academic Supervision and Learning Quality is positive, indicated by an r-value of 0.814. The Sig. (2-tailed) value is 0.000, meaning that the relationship between X1 and Y is very strong and significant, as 0.000 < 0.05. The hypothesis was further tested using the ANOVA results in Table 4.

Table 4. ANOVA Results of X1 on Y

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	17118.430	1	17118.430	284.236	.000b
Residual	8732.795	145	60.226		
Total	25851.224	146			
a. Dependent Variable: Learning Quality					
b. Predictors: (Constant), Academic Supervision					
Source: SPSS Output					

Table 4.4 indicates that the ANOVA test of Academic Supervision on Learning Quality yielded a significance value of 0.000, which is smaller than 0.05 (0.000 < 0.05). The calculated F-value was 284.236, greater than the F-table value at the 0.05 confidence level (3.08). Since F-calculated > F-table, the first hypothesis stating that "there is an effect of Academic Supervision on Learning Quality in Public Elementary Schools in Mijen District" is accepted. The magnitude of the effect of Academic Supervision on Learning Quality is presented in Table 5.

Table 5. Effect Size of Variable X1 on Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.814a	.662	.660	7.761
a. Predictors: (Constant), Academic Supervision				
b. Dependent Variable: Learning Quality				

Source: SPSS Output

Table 5 shows an R Square value of 0.662 or 66.2%, meaning that the influence of Academic Supervision on Learning Quality is 66.2%, while the remaining 33.8% is influenced by other variables outside the research. The regression coefficient significance was further tested using the t-test as presented in Table 6.

Table 6. t-Test Results of X1 on Y

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	
(Constant)	69.920	5.422		12.895
Academic Supervision	.661	.039	.814	16.859
a. Dependent Variable: Learning Quality				

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
Source: SPSS Output				

The regression equation can thus be written as:

$\hat{Y} = 69.920 + 0.661X1$

Based on the regression coefficient analysis, the following conclusions can be drawn:

1. The dependent variable, Learning Quality, has a constant value of 69.920 when Academic Supervision remains unchanged.
2. The regression coefficient of 0.661 indicates that for every one-unit increase in Academic Supervision, Learning Quality increases by 0.661, assuming other independent variables remain constant.
3. It can therefore be concluded that an increase in Academic Supervision leads to an improvement in Learning Quality.

2) Hypothesis 2: The Influence of Learning Community on the Quality of Learning at Public Elementary Schools in Mijen District

The test was conducted to determine the influence of the Learning Community variable on Learning Quality. This analysis is important to examine the extent of the Learning Community's role in improving the effectiveness of the learning process at schools. The test used simple linear regression analysis with the assistance of SPSS 21.0 to obtain regression coefficients, significance values, and the strength of the relationship between variables. The results are presented in the following tables for clearer interpretation. The test of the influence of Learning Community (X2) on Learning Quality (Y) can be seen in Table 7 below:

Table 7. Correlation Test X2 to Y

	Learning Quality	Learning Community
Learning Quality	Pearson Correlation = 1	.861**
	Sig. (2-tailed) =	.000
	N = 147	147
Learning Community	Pearson Correlation = .861**	1
	Sig. (2-tailed) = .000	
	N = 147	147

Table 7 shows that the correlation between the Learning Community variable and Learning Quality is positive, indicated by the correlation coefficient (r) of 0.861. Meanwhile, the Sig. (2-tailed) The value is 0.000, which demonstrates a very strong and significant relationship since 0.000 < 0.05. The ANOVA test for the Learning Community variable on Learning Quality is as follows:

Table 8 ANOVA Test X2 to Y

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	19163.478	1	19163.478	415.492	.000b
Residual	6687.747	145	46.122		
Total	25851.224	146			

Table 8 shows the ANOVA test results of the Learning Community on Learning Quality. The analysis indicates a significance value of 0.000, which is smaller than the significance level of 0.05 (0.000 < 0.05). The calculated F value of 415.492 is greater than the F table value at a 0.05 confidence level, which is 3.08. Since F-count (415.492) > F-table (3.08), the second hypothesis stating that there is an influence of Learning Community on Learning Quality at public elementary schools in Mijen District is accepted. The influence of the Learning Community on Learning Quality is presented in Table 9 as follows:

Table 9. Coefficient of Determination X2 to Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.861a	.741	.740	6.791

The R Square value in Table 4.26 indicates that the Learning Community (X2) contributes 74.1% to Learning Quality (Y), while the remaining 25.9% is influenced by other variables outside this study. This figure shows that the Learning Community has a substantial influence on improving learning quality. To further determine the partial significance of this influence, a t-test was conducted. The t-test results can be seen in Table 4.10 below:

Table 10. t-Test X2 to Y

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	73.010	4.338			16.830
Learning Community	.685	.034	.861		20.384

From Table 10, the regression equation can be written as follows: $\hat{Y} = 73.010 + 0.685X2$

Based on the regression coefficient analysis, it can be concluded that:

1. The value of the dependent variable, Learning Quality, can be observed from the constant at 73.010, assuming the independent variable remains constant.
2. The influence of the Learning Community variable on Learning Quality, as seen from the regression coefficient of 0.685, means that for every one-unit increase in the Learning Community, the Learning Quality will increase by 0.685, assuming other independent variables remain constant.
3. It can be concluded that if the Learning Community improves, the Learning Quality will also increase.

3) Hypothesis 3: The Effect of Collaborative Leadership on Learning Quality in Public Elementary Schools in Mijen District

The test of the effect of Collaborative Leadership (X3) on Learning Quality (Y) can be seen in Table 11 below.

Table 11. Correlation Test of X3 to Y

Correlations

		Learning Quality	Collaborative Leadership
Learning Quality	Pearson Correlation = 1		.726**
	Sig. (2-tailed)		.000
	N = 147		147
Collaborative Leadership	Pearson Correlation = .726**		1
	Sig. (2-tailed)		.000
	N = 147		147

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

Source: SPSS Output

Table 11 shows that the correlation between Collaborative Leadership and Learning Quality is positive, indicated by an r-value of 0.726. Meanwhile, the significance value of .000 < 0.05 indicates a strong and significant correlation between X3 and Y. The F-test results of Collaborative Leadership on Learning Quality are presented in Table 12.

Table 12. ANOVA Test of X3 to Y

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	13633.109	1	13633.109	161.793	.000b
Residual	12218.116	145	84.263		
Total	25851.224	146			

a. Dependent Variable: Learning Quality
b. Predictors: (Constant), Collaborative Leadership
Source: SPSS Output

Table 12 explains that the ANOVA test of Collaborative Leadership on Learning Quality resulted in a significance value of .000 < 0.05. The calculated F-value is 161.793, which is greater than the F-table value of 3.08 at the 0.05 confidence level. Thus, Hypothesis 3, which states that Collaborative Leadership significantly affects Learning Quality in public elementary schools in Mijen District, is accepted. The effect size is shown in Table 13.

Table 13. Effect Size of Variable X3 on Variable Y

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.726a	.527	.524	9.179

a. Predictors: (Constant), Collaborative Leadership
b. Dependent Variable: Learning Quality
Source: SPSS Output

Table 13 shows that the R Square value is 0.527, meaning that Collaborative Leadership contributes 52.7% to Learning Quality, while the remaining 47.3% is influenced by other variables outside this study. This indicates that Collaborative Leadership has a moderate effect on Learning Quality. To determine the partial significance of this effect, a t-test was conducted, as shown in Table 14

Table 14. t-test Results of X3 to Y

Coefficientsa

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	
(Constant)	83.439	6.121		13.632

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
Collaborative Leadership	.610	.048	.726	12.720

a. Dependent Variable: Learning Quality
Source: SPSS Output

From Table 4.13, the regression equation can be formulated as:

Ŷ = 83.439 + 0.610X3

Based on this regression coefficient analysis, it can be concluded that:

1. The dependent variable (Learning Quality) has a constant value of 83.439 when the independent variable remains unchanged.
2. The regression coefficient of 0.610 indicates that each one-unit increase in Collaborative Leadership will increase Learning Quality by 0.610, assuming other independent variables remain constant.
3. Thus, when Collaborative Leadership improves, Learning Quality also increases.

b. Multiple Regression

4) **Hypothesis 4: The Influence of Academic Supervision, Learning Community, and Collaborative Leadership on the Learning Quality of Public Elementary Schools in Mijen District**

An ANOVA test was conducted to determine whether Hypothesis 4 is accepted or rejected. The results are presented in Table 15 below:

Table 15. ANOVA Test Results of Regression X1, X2, X3 on Y

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	19985.207	3	6661.736	162.398	.000b
Residual	5866.017	143	41.021		
Total	25851.224	146			

a. Dependent Variable: Learning Quality
b. Predictors: (Constant), Collaborative Leadership, Academic Supervision, Learning Community

Table 15 shows that F-calculated = 162.398 > F-table = 3.08 with a probability significance level of 0.000 < 0.05, meaning H0 is rejected and H4 is accepted. Thus, the regression model used in this study is significant, indicating that academic supervision, learning community, and collaborative leadership significantly influence learning quality.

The next step is to examine the Adjusted R Square value in Table 4.15 to determine the magnitude of influence of the independent variables on the dependent variable.

Table 16. Model Summary of Regression X1, X2, and X3 on Y

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.879a	.773	.768	6.405

a. Predictors: (Constant), Collaborative Leadership, Academic Supervision, Learning Community
b. Dependent Variable: Learning Quality

Table 16 shows that academic supervision, learning community, and collaborative leadership together influence learning quality. The R Square value of 0.773 or 77.3% indicates that variations in learning quality can be explained by these three variables. Meanwhile, the Adjusted R Square value of 0.768 shows that the model is stable and not overfitted. The remaining 22.7% is influenced by other factors not included in the model, such as job satisfaction, work motivation, and other contextual factors.

Table 17. Regression Coefficients of X1, X2, and X3 on Y

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	63.180	4.767		13.254	.000
Academic Supervision (X1)	.253	.059	.311	4.318	.000
Learning Community (X2)	.437	.071	.381	6.187	.000
Collaborative Leadership (X3)	.354	.057	.264	3.933	.000

a. Dependent Variable: Learning Quality
b. Source: SPSS Output

The regression equation obtained is:

Y = 63.180+0.253X1+0.437X2+0.354X3

Y = 63.180 + 0.253X1 + 0.437X2 + 0.354X3

Y = 63.180+0.253X1+0.437X2+0.354X3

Where:

- Y = Learning Quality
- X1 = Academic Supervision
- X2 = Learning Community
- X3 = Collaborative Leadership

Analysis of the regression coefficients can be interpreted as follows:

1. The constant value of 63.180 indicates the baseline of learning quality when independent variables are held constant.
2. Academic supervision (X1) has a regression coefficient of 0.253, meaning that each improvement in academic supervision increases learning quality, assuming other variables remain constant.
3. Learning community (X2) has a regression coefficient of 0.437, indicating that strengthening the learning community significantly improves learning quality, ceteris paribus.
4. Collaborative leadership (X3) has a regression coefficient of 0.354, which means that improvements in collaborative leadership also enhance learning quality when other variables are constant.
5. In conclusion, if academic supervision, learning community, and collaborative leadership improve, then learning quality also increases.

Discussion

The results indicate that academic supervision (X1), learning community (X2), and collaborative leadership (X3) each have a significant positive effect on learning quality (Y) in elementary schools in Mijen District. Additionally, collectively, they explain 77.3% of the variance in learning quality, highlighting the essential interrelated impact of these educational leadership factors.

1. Academic Supervision's Effect on Learning Quality

Academic supervision, defined as systematic planning, observation, and feedback, is a critical principal task (Yuningsih et al., 2024 ; Nur Asnani Nasmin et al., n.d.). Our findings demonstrate a very strong positive correlation ($r = 0.814$) and $R^2 = 0.662$, supporting its substantial contribution. Similarly, recent research by Ikrima Mailan (2023) confirms that effective principal supervision enhances overall learning quality in integrated Islamic primary schools. Tamim Mulloh & Muslim, (2022) Advocates that well-designed supervision fosters professional innovation. Additional studies substantiate these results: a study in Gunungpati District found that principal academic supervision explains 65.5% of school quality variance. Yusnita SDN & Sambas, (2022) showed that supervision significantly improves teachers' pedagogical competence. (Syafitri et al., 2023) Demonstrated that academic supervision, instruction leadership, and discipline collectively enhance elementary school quality, though supervision alone had a modest contribution. Research

in South Pemulutan highlights a positive and significant influence of principals' academic supervision on learning quality and (Fatimah & Rosyidah, 2021) emphasizes that collegial, broad-based supervision positively affects teaching and learning digitalcommons.library.umaine.edu.

Nonetheless, our dimensional analysis revealed that the planning aspect of supervision is weakest in Mijen, which confirms Imelda (2024) view that effective supervision must begin with sound planning. In practice, administrative routines overshadow developmental goals, limiting supportive interaction and pedagogical advancement.

Therefore, for supervision to significantly enhance learning quality, it must be carefully planned, transforming it from a perfunctory duty into strategic, professional development that elevates teaching effectiveness. Strengthening principals' capacity in supervision planning and implementation should be prioritized in leadership training programs.

2. The Effect of Learning Community on Learning Quality in Public Elementary Schools in Mijen District

The learning community variable often receives insufficient attention in efforts to improve learning quality. Defined by Novita & Radiana (2024) as an organization where members continually develop their capacities, expand thinking, and learn together—and emphasized by Dirjen GTK (2023) as marked by shared vision, regular reflection, and collaborative problem-solving—our study finds that the learning community in Mijen is perceived at a moderate level, with *shared repertoire* being the weakest dimension.

This gap aligns with Arifin & Hanif (2024), who explains that learning communities must provide spaces for teachers to share experiences and discuss solutions collectively. Although collaborative inquiry emerges as the strongest dimension, professional collaboration remains limited (Harlita & Ramadan, 2024), who argues that learning communities should foster sustainable professional collaboration.

Regression results demonstrate the strong influence of learning communities, with a correlation of 0.861 and an R^2 of 0.741, indicating that 74.1% of variability in learning quality is explained by this factor. These results suggest that strengthening teacher collaboration is a strategic pathway toward improved instructional practices.

Previous studies reinforce this finding. Cholivah & Hidayati (2025) concluded that professional learning communities significantly enhance student achievement in small schools. Research on lesson-study communities also showed improvements in elementary learning models

through structured collaborative inquiry. Asih et al. (2023) highlighted that PLC dimensions play a crucial role in enhancing elementary teachers' performance, while (Muliantara & Suarni, 2022) Their meta-analysis confirmed that PLC participation improves teaching practice, student learning, and teacher collaboration. Similarly, a case study in Michigan found that high-quality teacher collaboration benefited both students and staff when it was perceived as extensive and supportive.

Taken together, these results affirm that a well-developed learning community promotes reflection, collaboration, and sustained improvement, which in turn leads to higher teaching quality and more meaningful learning outcomes. For schools in Mijen, intentional promotion of professional sharing, collective planning, and sustained collaboration is essential to maximize the potential of learning communities in enhancing educational quality.

3. The Influence of Collaborative Leadership on Learning Quality in Public Elementary Schools in Mijen District, Semarang City

Collaborative leadership is an important approach in improving learning quality, yet it often does not become the main focus in school management. Indriasari et al. (2024) defines collaborative leadership as a managerial skill conducted through constructive cooperation with stakeholders, facilitating and maintaining positive organizational interaction. El Ilmi et al. (2025) adds that collaborative leadership requires openness in communication, equality of roles between leaders and members, and participatory decision-making, thus fostering shared ownership of organizational goals.

Findings from this study show that teachers' perceptions of collaborative leadership in Mijen District are moderate. The lowest contribution lies in the dimension of effective communication skills, suggesting that open, constructive dialogue between principals and teachers is still limited. Teachers also need to develop openness to feedback from younger colleagues. Putri Pratiwi et al. (2023) emphasizes that effective communication is the foundation of a productive collaborative culture in schools. Meanwhile, the dimension of goal-oriented skills recorded the highest contribution, reflecting the principal's ability to set learning objectives aligned with regulations and school conditions. However, teachers' professional collaboration remains underdeveloped, with stronger engagement in social activities rather than pedagogical support.

Regression analysis indicates that collaborative leadership contributes 52.7% to learning quality (R Square = 0.527), with a strong positive correlation (r = 0.726). This implies that strengthening collaborative practices significantly improves the effectiveness of teaching and

learning. The remaining 47.3% of variance is influenced by other factors outside this study, highlighting the need for broader systemic support.

This conclusion aligns with Supit et al. (2025), who found that collaborative leadership through communication and teamwork enhances teacher performance and positively impacts learning quality. Similarly, Ramadhan & Welis (2024) stress that success in collaborative leadership depends on empowering teachers as equal partners, providing professional support, and encouraging active participation in school decision-making. Ultimately, collaborative leadership shapes not only managerial effectiveness but also classroom practices, fostering reflection, shared responsibility, and sustainable professional growth that enhance the quality of education.

4. The Joint Influence of Academic Supervision, Learning Communities, and Collaborative Leadership on Learning Quality in Public Elementary Schools in Mijen District, Semarang City

Learning quality is a reflection of a school's overall effectiveness. Mastuti et al. (2022) defines it as the extent to which initial learning objectives are achieved, including the development of students' knowledge, skills, and attitudes. Susiyani et al. (2024) emphasizes that effective learning quality depends not only on teachers' mastery of content but also on well-planned instruction, effective implementation, and continuous evaluation.

Findings from this study indicate that the lowest contributing dimension is students' learning behavior, revealing that classroom practices are still not optimally implemented by teachers. Meanwhile, learning effectiveness emerged as the strongest dimension, supported by professional teachers with teaching certificates and adequate school facilities. This aligns with Dirjen GTK (2023), which stresses that professional teachers, sufficient facilities, and visionary leadership are key determinants of effective teaching and learning.

Regression analysis shows that academic supervision, learning communities, and collaborative leadership collectively influence learning quality by 77.3% (Adjusted R Square = 0.773). The regression coefficients indicate that all three factors positively contribute: academic supervision (0.253), learning communities (0.437), and collaborative leadership (0.354). This confirms that improvements in these three areas will significantly enhance overall learning quality.

These findings echo Siahaan et al. (2023), who argues that improved learning quality requires synergy between structured academic supervision, collaborative teacher learning, and participatory leadership. Similarly, research by Permana & Karwanto, (2020) demonstrated that collaborative

school leadership enhances teacher performance and positively impacts instructional quality. The positive and significant correlations observed here underscore the importance of strengthening each factor to create a conducive, innovative, and reflective school ecosystem.

The integration of these three elements encourages teachers to be more open to feedback, innovate in pedagogy, and enhance professional competencies. Consequently, students experience more meaningful and interactive learning processes, not only improving academic achievement but also developing character, skills, and attitudes. Ultimately, sustained academic supervision, active learning communities, and consistent collaborative leadership should be prioritized as strategic initiatives to ensure the continuous improvement of education quality in elementary schools, aligned with national educational goals.

CONCLUSION

This study provides a comprehensive view of how academic supervision, learning communities, and collaborative leadership interact as essential drivers for strengthening the quality of learning in public elementary schools. The findings highlight the significance of integrating managerial, professional, and collective practices in school governance to ensure that instructional processes are not only effective but also sustainable in responding to the evolving demands of education. The contribution of this research lies in its ability to connect leadership, professional supervision, and collaborative culture into a unified framework that supports teachers' professional growth and students' holistic development. In light of this, the study underscores the importance of building systemic efforts that foster strong supervision, cultivate active learning communities, and sustain collaborative leadership as strategic pillars of educational improvement. These elements must be reinforced through policy support, continuous professional development, and participatory school management. Ultimately, this integration serves as a roadmap for schools to create an ecosystem where teachers are empowered, students thrive, and the broader educational goals are realized in a transformative and sustainable manner.

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