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THE INFLUENCE OF DATA-BASED PLANNING, LEARNING COMMUNITIES, AND ACADEMIC SUPERVISION ON LEARNING QUALITYIN PUBLIC HIGH SCHOOL STUDENTS IN PEMALANG REGENCY

Rizki Fauzan[1], Harjito[2], Nurkolis[3]
[123]Universitas PGRI Semarang; Indonesia
Correspondence Email*; rizkifauzan997@gmail.com

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Abstract

This study aimed to determine the effect of data-based planning, learning communities, and academic supervision on the quality of learning in public senior high schools within Pemalang Regency. This research goal was accomplished through the use of a quantitative research approach. The population of this study comprised all 184 teachers from three public senior high schools in Pemalang Regency, with a sample of 126 participants selected through a proportional random sampling technique. A questionnaire comprising statements to gauge indices of learning quality, data-based planning, learning communities, and academic supervision served as the primary data source. Using SPSS software, the data analysis included descriptive analysis, requirement testing, and hypothesis testing. This involved using simple linear regression and multiple regression methods. The results showed that there was a favorable and significant impact of data-based planning on the quality of learning, with a contribution of 84.2%. With an 83.3% contribution, teacher involvement in the learning community also improved the quality of learning. Academic supervision also had a favorable impact on learning quality, with a contribution of 80.2%. Together, data-based planning, academic supervision, and teacher involvement in the learning community had a favorable impact on the standard of teacher education, with a contribution of 90.2%. To enhance the quality of learning within educational institutions, teachers need to create learning plans based on data, collaborate and share good practices through learning communities, and the principal must provide in-depth mentoring to teachers in academic supervision activities.

Keywords Learning Quality, Data-Based Planning, Learning Community, Academic Supervision.

INTRODUCTION

Based on the 2025 Education Report, both public and private high schools in Pemalang Regency experienced a decline in learning quality compared to 2024. Learning quality is the effectiveness of teaching practices demonstrated by how teachers manage the classroom, support students, and activate students' cognitive processes, which constitute a basic three-dimensional framework of learning quality that impacts student learning outcomes. One theory of learning quality refers to the basic three-dimensional framework of learning quality. These three dimensions include classroom management, psychological support, and cognitive activation (Jaekel et al., 2021; Praetorius et al., 2018).

The quality of learning can be improved through the use of data-driven approaches in educational decision-making (Guo et al., 2024). Data-driven planning can be described as a method for systematically examining existing data sources in educational institutions, utilizing the results of these examinations to improve teaching, curriculum, and institutional performance, and implementing and assessing the resulting innovations (Schildkamp, 2019). Data-driven planning enables teachers to monitor student progress over time, evaluate the effectiveness of implemented strategies, and adjust teaching methods to achieve optimal results (Widiyawati et al., 2025). Through a deep understanding of data such as learning outcomes, cognitive abilities, participation levels, and individual student needs, teachers can make more accurate decisions in selecting appropriate learning methods, materials, and approaches (Damaryanti et al., 2023). The five main dimensions of data-driven planning are technological infrastructure, data culture, data use goals, and data literacy, all of which are seen as interacting within a school system (Doğan & Demirbolat, 2021).

In practice, data-driven planning can be optimized through collaboration within learning communities, where teachers and principals jointly discuss learning improvement strategies tailored to data and student needs, as evidenced by school report cards, assessment data, and reflections on learning outcomes. A learning community is defined as a setting where teachers can exchange knowledge and experiences to raise the standard of education (Kiriana et al., 2022). Learning communities provide a structured platform for cooperation between educators and the school leaders in collectively implementing data-driven planning. Within learning communities, teachers collaborate in reviewing the data ecosystem, from school report cards, formative and summative assessment results, to reflection notes during the learning process, under the guidance of school leaders who model appropriate data interpretation. This leadership support and time allocation

ensure that data is not only analyzed individually but also discussed in a shared forum, fostering a shared understanding and collective commitment to formulating more targeted learning follow-ups (O'Connor & Park, 2023). The five dimensions of a learning community include supportive and shared leadership, shared values and vision, collective learning and application, supportive conditions, and sharing in practice (Zheng et al., 2021; Widiyanto, 2018)

Academic supervision plays a crucial part in enhancing the quality of learning by ensuring the learning process runs smoothly and aligns with educational guidelines and standards (Sudirman et al., 2024). Academic supervision is a collaborative approach between teachers and supervisors aimed at improving the quality of teaching. This supervision is carried out through a professional, open, democratic relationship, and is oriented towards teacher development, not just assessment (Musundire & Dreyer, 2019). The principal, who acts as an academic supervisor, is tasked not only with monitoring and evaluation but also with providing constructive guidance to teachers (Rachmawati & Fitria, 2024). Effective academic supervision will foster a sustainable learning culture and positively impact the caliber of instruction provided by educators in the classroom (Singerin, 2021; Herawati, 2017).

The dimensions of academic supervision include supervision planning, supervision implementation, and supervision follow-up (Yulistyarini et al., 2024; Rusdiman, 2025). First, joint planning, which includes the collaborative formulation of learning objectives and the development of agreed-upon methods, materials, and feedback strategies among teachers. Second, collaborative observation, which is an observation process carried out not to control, but to provide support, with a collegial, non-hierarchical approach. Third, post-observation discussions, which provide feedback oriented towards teacher professional development, not merely assessment, and involve teachers as colleagues, not as subordinates. Finally, teacher empowerment, which aims to increase teacher motivation, self-confidence, and independence, while providing space for them to actively participate in the process of making decisions at school (Musundire & Dreyer, 2019).

Based on the results of the 2025 Pemalang Regency State Senior High School Education Report, it can be concluded that all State Senior High Schools in Pemalang Regency demonstrated literacy and numeracy skills in the good category (100%). In addition, all State Senior High Schools in Pemalang Regency also had good character (100%). However, the quality of learning still needs to be improved, because three of the eleven State Senior High Schools in Pemalang Regency are still at a moderate level (27%), while the other eight schools have achieved a good level (73%) in learning

quality. Based on the results of a survey in several schools, although only three schools are still in the moderate category, several State Senior High Schools in Pemalang Regency experienced a decrease in scores in the learning quality dimension compared to 2024, although they are still in the same category, namely good. Meanwhile, all State Senior High Schools in Pemalang Regency have achieved a good level (100%) in the aspects of reflection and learning changes by teachers and instructional leadership.

Research by Al-Zahrani & Alasmari (2023) demonstrates how using Learning Analytics (LA) to make data-driven decisions helps significantly to improve the quality of learning. These findings demonstrate that instructional personalization and higher learning engagement are made possible by data-driven decision-making via LA, which eventually improves learning quality. Support for these results also comes from an investigation by Hidayah et al. (2025) who implemented a data-driven planning model through the Identify, Reflect, Improve cycle based on the Education Report at SMP Negeri 1 Petungkriyono. The findings indicated a notable rise in learning quality indicators. However, learning quality is generally still in the moderate category, so strengthening direct instructional practices is still necessary.

Zhang et al. (2023) research found that the traits of professional learning communities, particularly collective inquiry and sharing, shared purpose and responsibility, and supportive leadership, were positively and significantly connected to increased self-efficacy and work happiness among teachers in Shanghai, with β coefficients ranging from .12 to .86 ($p < .001$). Furthermore, Zheng et al. (2021) found that the dimensions of thoughtful discussion, a common goal, and a group emphasis on student learning significantly predicted increases in self-efficacy (Est. = 32.81, $p < .001$) and teacher commitment (Est. = 25.69, $p < .01$), although collaborative activity had a negative effect on both variables. These findings confirm that the integration of learning community practices not only strengthens teachers' self-confidence and commitment but also serves as a key driver for improving the quality of learning in schools.

Furthermore, research by Yulistyarini et al. (2024) stated that principal supervision, work culture, and teacher work motivation are important predictors that influence the quality of learning in Public Junior High Schools in Sub-District 01 of Pekalongan Regency, with a multiple correlation of 0.961 and a significance of 5%, which indicates that these three factors are essential for learning achievement. Furthermore, Suryani et al. (2025) found that academic supervision, teacher teaching skills, and a child-friendly school environment have a noteworthy effect on improving the quality

of learning in 20 Public Elementary Schools in Kembang District, Jepara Regency; multiple regression analysis showed a contribution of 27.2%, 18.9%, and 15.2%, respectively, and simultaneously contributed 39.8%. Finally, Mailani et al. (2023) revealed that in the context of Integrated Islamic Elementary Schools in Kuantan Singingi Regency, academic supervision had a significant influence with a contribution of 34.1% ($R^2 = 0.341$), teacher professionalism contributed 77.0% ($R^2 = 0.770$), and both variables simultaneously contributed 44.3% ($R^2 = 0.443$) to the quality of learning. These findings collectively emphasize the importance of optimizing supervision, improving teaching competency, and creating a supportive school environment to achieve better learning quality.

This study presents novelty through the simultaneous integration of three strategic variables: data-driven planning, learning communities, and academic supervision in examining their impact on learning quality in public senior high schools, particularly in Pemalang Regency. This approach allows for a more comprehensive identification of the relative and combined contributions of all three to improving learning quality. Furthermore, the focus on the context of senior high schools in the regency, which is still rarely studied, strengthens the practical relevance and novelty of this study in providing a basis for policy and planning for improving the quality of secondary education based on data, teacher professional collaboration, and effective supervision practices.

Based on the conditions that have been explained, research on the influence of data-based planning, learning communities, and academic supervision on the quality of learning is very important to carry out. The objectives of this study include: knowing the influence of data-based planning on the quality of learning in Senior High Schools in Pemalang Regency, knowing the influence of learning communities on the quality of learning in Senior High Schools in Pemalang Regency, knowing the influence of academic supervision on the quality of learning in Senior High Schools in Pemalang Regency, and observing the simultaneous influence between data-based planning, learning communities, academic supervision on the quality of learning in Senior High Schools in Pemalang Regency.

The formulation of this research problem is based on the background above which includes: is there an influence of data-based planning on the quality of learning in State Senior High Schools in Pemalang Regency?, is there an influence of learning communities on the quality of learning in State Senior High Schools in Pemalang Regency?, is there an influence of academic supervision on the quality of learning in State Senior High Schools in Pemalang Regency?, and is there a

simultaneous influence between data-based planning, learning communities, and academic supervision on the quality of learning in State Senior High Schools in Pemalang Regency?.

METHOD

To determine how variables interact with each other, this study used correlational methods and quantitative analysis. This approach was selected due to the fact that it allowed researchers to test the suspected causal relationship between the independent variables, data-driven planning, learning communities, and academic supervision, as well as the dependent variable, learning quality. The data was then analyzed using statistical analysis. This aimed to achieve objective results that could be generalized to a larger population (Sugiyono, 2022).

The location of the research was the State Senior High Schools in the southern region of Pemalang Regency, including State Senior High School 1 Belik, State Senior High School 1 Randudongkal, and State Senior High School 1 Bantarbolang, with a population of 184 teachers. The sampling technique used was proportional random sampling. The sample determination used the Solvin formula with a significance level of 0.05 (5%) with a confidence level of 95%. Based on the calculation, the sample size was 126 teachers from three State Senior High Schools in Pemalang Regency.

This study used primary quantitative data collected through a 5-point Likert questionnaire (strongly agree=5, agree=4, moderately agree =3, disagree=2, strongly disagree=1) to measure indicators of learning quality (51 items), data-based planning (32), learning communities (36), and academic supervision (32). The questionnaire aimed to measure respondents' perspectives, opinions, and perceptions of these variables. 126 teachers from three public high schools in Pemalang Regency filled out via Google Forms.

This research design describes the hypothesis of a causal relationship between data-based planning (X_1), learning communities (X_2), and academic supervision (X_3) as independent variables, and learning quality (Y) as the dependent variable. The research design is presented in the following figure.

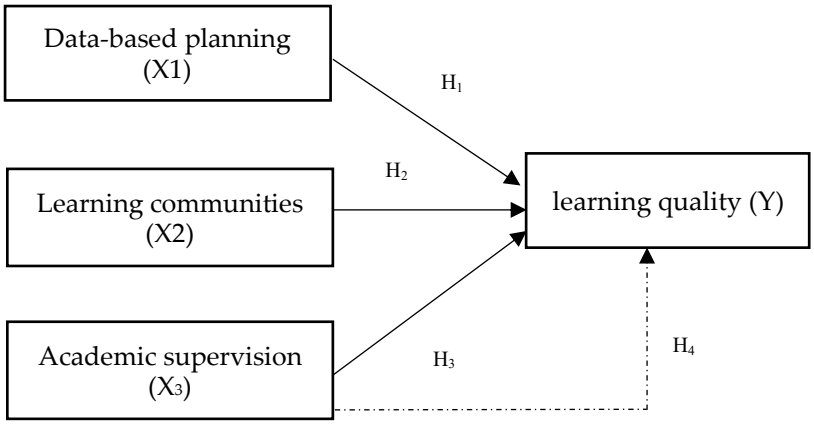

Figure 1. Research Design

Based on the research objectives and theoretical basis, four hypotheses are formulated, including hypothesis 1 (H_1): there is an influence of data-based planning on the quality of learning in Senior High Schools in Pemalang Regency. Hypothesis 2 (H_2): There is an influence of learning communities on the quality of learning in Senior High Schools in Pemalang Regency. Hypothesis 3 (H_3): There is an influence of academic supervision on the quality of learning in Senior High Schools in Pemalang Regency, and hypothesis 4 (H4): Data-based planning, learning communities, and academic supervision simultaneously influence the quality of learning in Senior High Schools in Pemalang Regency.

In research using numerical (quantitative) data, there are two main stages in analyzing the collected data. The first stage is describing the data. To describe the data, descriptive statistics are used. Descriptive statistics are statistical tools utilized to enumerate and present data in easy-to-understand formats, such as tables, graphs, or simple numbers, such as mean, median, mode, and standard deviation. The second stage is statistical testing (inference) to conduct a more in-depth analysis. Researchers attempt to draw broader conclusions from the existing data (Sugiyono, 2022).

The instrument testing method consists of two stages: validity and reliability. Validity measures the extent to which test items reflect the construct (Sugiyono, 2022) by calculating the correlation of each item to the total score using Pearson Product-Moment; an item is declared valid if the calculated t-value > t-table and r is positive > r-table. Reliability assesses the consistency of the score, the r11 value compared to the r-table at df = n−2 and $\alpha = 0.05$; the instrument is reliable if r11 > r-table. Cronbach's alpha ranges from 0–1; the closer it is to 1, the higher the reliability.

Prior to the regression analysis, classical assumption tests were conducted: a linearity test to ensure a linear relationship between the independent variables data-driven planning, learning community, academic supervision and the dependent variable (learning quality) at $\alpha = 0.05$; a

normality test with Kolmogorov–Smirnov in SPSS (Asymp. Sig. (2-tailed) > 0.05 = normal). Multicollinearity was checked through Tolerance and VIF (none if Tolerance > 0.10 and VIF < 10). Heteroscedasticity was tested using the Glejser method in the regression of absolute residual values. Homoscedasticity occurs if the significance is > 0.05. (Nuryadi et al., 2017; Indartini & Mutmainah, 2024).

Partial hypothesis testing is performed using the t-test: an independent variable is considered to have a significant effect if the p-value (sig.) < 0.05. The joint effect is tested using the F test; H_0 is rejected if F count > F table or sig. < 0.05. The correlation coefficient R (−1 to +1) describes the direction and strength of the relationship (−1 is perfectly negative, 0 is zero, +1 is perfectly positive). Adjusted R^2 shows the proportion of variance in the dependent variable explained by the model (Sugiyono, 2022).

FINDINGS AND DISCUSSION

Findings

Validity and Reliability Test Results

Validity test on a temporary sample of 30 respondents (r table = 0.361; $\alpha = 0.05$) showed that all items X_1 (data-based planning), X_2 (learning community), and X_3 (academic supervision) were valid, while variable Y (54 items) had three invalid items. Reliability test using Cronbach's α (threshold > 0.6) produced: $X_1 = 0.962$; $X_2 = 0.987$; $X_3 = 0.985$; Y = 0.975 all > 0.6, so they were declared reliable.

Classical Assumption Test

Normality Test Results

Table 1. Summary of Data Normality Test Results

Variable Relationship	Value Sig.
Y vs. X_1 (data-based planning)	0.06
Y vs. X_2 (learning community)	0.10
Y vs. X_3 (academic supervision)	0.06
Y vs. X_1, X_2, X_3	0.20

The results of the Kolmogorov–Smirnov normality test on the residuals (Y = learning quality) showed p = 0.06 for Y vs X1 (data-driven planning), p = 0.10 for Y vs X2 (learning community), p = 0.06 for Y vs X3 (academic supervision), and p = 0.20 for the multiple model (Y vs X1, X2, X3); since all significance values were > 0.05, the residuals were normally distributed and the normality assumption was met, with the multiple model showing the strongest evidence of normality.

Linearity Test Results

Table 2. Linearity Test Results

Variable Relationship	F Deviation	Sig.
Y vs. X_1 (data-based planning)	0.749	0.835
Y vs. X_2 (learning community)	1.327	0.175
Y vs. X_3 (academic supervision)	1.458	0.089

Based on the table, the Deviation from Linearity test yields p = 0.835 (data-based planning), p = 0.175 (learning community), and p = 0.089 (academic supervision), all > 0.05, so there is no deviation from linearity and supports a linear relationship with learning quality.

Multicollinearity Test Results

Table 3. Multicollinearity Test Results

Variables	*Collinearity Statics*	
	Tolerance	*VIF*
Data-Based Planning (X_1)	0.563	1.777
Learning Community (X_2)	0.502	1.933
Academic Supervision (X_3)	0.372	2.689

In Table 5, all Variance Inflation Factor (VIF) values are below 10 and all tolerance values exceed 0.10, indicating the absence of multicollinearity among the independent variables in the regression model. Consequently, the predictors may be regarded as sufficiently independent.

Heteroscedasticity Test Results

Table 4. Heteroscedasticity Test Results

Variables	*Standardized Coefficients Beta*	Sig.
Data-Based Planning (X_1)	-0.081	0.501
Learning Community (X_2)	-0.103	0.420
Academic Supervision (X_3)	0.120	0.418

In the table presented, all significance values (Sig) are recorded above 0.05. This indicates that there is no heteroscedasticity problem among the regression model's independent variables. Therefore, each variable can be considered as having a constant residual variance from one observation to the next.

Autocorrelation Test Results

Table 5. Multicollinearity Test Results

Model	R	R^2	Customised R^2	Std. Error of the Estimate	Durbin Watson
1	0.950	0.902	0.900	6.349	1.858

Based on the Model Summary table, the Durbin-Watson (DW) value = 1.858. The Durbin-Watson test is used to detect the presence of autocorrelation in the regression residuals. The number of predictors is known to be K = 3, and the number of samples = 126. Based on the Durbin Watson table, the du value is obtained = 1.858. Because the value of 1.858 is in the range (1.7582) < Durbin Watson (1.858) < 4 -du (2.142), it can be concluded that there is no autocorrelation in this regression model. Therefore, the normality, linearity, multicollinearity, heteroscedasticity, and autocorrelation tests meet all classical assumption tests.

Hypothesis Testing

Hypothesis 1: The Influence of Data-Based Planning on Learning Quality

Table 6. Correlation Between Data-Based Planning and Learning Quality

Correlation Value	Results
Pearson Correlation	0.918
Sig.(2-tailed)	0.000
N	126

Based on the table, the correlation coefficient (R) value obtained is 0.918. When referring to the correlation coefficient interpretation table, this value is in the range of 0.80–1.00, indicating a very strong relationship between data-based planning and learning quality.

Table 7. The Effect of Data-Based Planning on Learning Quality

Variables	t-value	Sig.
data-based planning	25.740	0.000

Based on the results of the t-test, the critical value at a 95% confidence level ($t_{0,025}$; df=126–1–1) is 1.97928, while the calculated t is 25.740. Because the calculated t>critical, it can be concluded that the data-based planning variable (X_1) has a significant effect on the quality of learning (Y).

Table 8. Coefficient of Determination of Data-Based Planning on Learning Quality

Model	R	R *Square*	*Adjusted* R *Square*	*Std. Error of the Estimate*
1	0.918	0.842	0.841	7.993

From the data above, the coefficient of determination (R^2) for the effect of data-based planning on the quality of teacher learning is 0.842 (84.2%), indicating that data-based planning explains 84.2% of the variance in teacher learning quality at public senior high schools in Pemalang Regency. The remaining 15.8% of the variance is attributable to other factors not examined in this study.

Hypothesis 2: The Influence of Learning Communities on Learning Quality

Table 9. Correlation Between Learning Communities and Learning Quality

Correlation Value	Results
Pearson Correlation	0.913
Sig.(2-tailed)	0.000
N	126

Based on the table, the correlation coefficient (R) value obtained is 0.913. When referring to the correlation coefficient interpretation table, this value is in the range of 0.80–1.00, indicating a very strong relationship between learning communities and learning quality.

Table 10. The Influence of Learning Communities on Learning Quality

Variables	t-value	Sig.
Learning Community	24.852	0.000

Based on the results of the t-test, the critical value at a 95% confidence level ($t_{0,025}$; df=126–1–1) is 1.97928, while the calculated t is 24.852. Because the calculated t>critical, it can be concluded that the learning community variable (X_2) has a significant effect on the quality of learning (Y).

Table 11. Coefficient of Determination of Learning Community on Learning Quality

Model	R	R *Square*	*Adjusted* R *Square*	*Std. Error of the Estimate*
1	0.913	0.833	0.831	8.232

Based on the information above, the coefficient of determination (R^2) for the relationship between the learning community variable and teacher learning quality was 0.833 (83.3%). This indicates that the learning community accounts for 83.3% of the variance in teacher learning quality at public senior high schools in Pemalang Regency, while the remaining 16.7% is attributable to factors not examined in this study.

Hypothesis 3: The Influence of Academic Supervision on Learning Quality

Table 12. Correlation Between Academic Supervision and Learning Quality

Correlation Value	Results
Pearson Correlation	0.896
Sig.(2-tailed)	0.000
N	126

Based on the table, the correlation coefficient (R) value obtained is 0.896. When referring to the correlation coefficient interpretation table, this value is in the range of 0.80–1.00, indicating a very strong relationship between academic supervision and learning quality.

Table 13. The Influence of Academic Supervision on Learning Quality

Variables	t-value	Sig.
Academic Supervision	22.430	0.000

Based on the results of the t-test, the critical t-value at a 95% confidence level ($t_{0,025}$; df=126–1–1) is 1.97928; while the calculated t is 9.252. Because the calculated t>critical, it can be concluded that the academic supervision variable (X_3) has a significant effect on the quality of learning (Y).

Table 14. Coefficient of Determination of Academic Supervision on Learning Quality

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.896	0.802	0.801	8.952

Based on the information above, the coefficient of determination (R^2) for the academic supervision variable in relation to teacher learning quality was 0.802 (80.2%). This suggests that academic supervision explains 80.2% of the variance in teacher learning quality at public senior high schools in Pemalang Regency, while the remaining 19.8% is attributable to other factors not addressed in this study.

Hypothesis 4: The Simultaneous Influence of Data-Based Planning, Learning Communities, and Academic Supervision on Learning Quality

Table 15. Test of the Effect of Data-Based Planning, Learning Communities, and Academic Supervision on Learning Quality

Model	Sum Of Squares	df	Mean Squares	F	Sig.
Regression	45,333.735	3	15,111.245	374.885	0.000
Residuan	4,917.693	122	40.309		
Total	50,251.429	125			

According to the table, the calculated F value is 374.885, while the F table value at the 5% significance level (0.05) with degrees of freedom $df_1 = 3$ and $df_2 = 122$ is 2.68. Since Fcount > Ftable (374.885 > 2.68) and the significance value of 0.000 is less than 0.05 (0.000 < 0.05), H_0 is rejected and H_a is accepted, indicating that hypothesis 4 is supported. Thus, it can be concluded that data-based planning, learning communities, and academic supervision collectively have a significant effect on the quality of learning in public senior high schools in Pemalang Regency.

Table 16. Coefficient of Determination of Data-Based Planning, Learning Communities, and Academic Supervision with Learning Quality

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.950	0.902	0.900	6.349

Based on the information above, the coefficient of determination (R^2) for the combined influence of data-based planning, learning communities, and academic supervision on teacher learning quality was 0.902. This indicates that these three variables collectively explain 90.2% of the variance in teacher learning quality at public senior high schools in Pemalang Regency, while the remaining 9.8% is attributable to other factors not identified in this study.

Table 17. Multiple Linear Regression Analysis of Data-Based Planning, Learning Communities, and Academic Supervision with Learning Quality

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
(Constant)	25.116	5.777	-	4.347	0.000
Data-Based Planning	0.712	0.090	0.477	7.873	0.000
Learning Communities	0.285	0.106	0.229	2.680	0.008
Academic Supervision	0.386	0.100	0.284	3.851	0.000

From the results of the table, the regression equation can be formulated as follows.

$$Y = 25.116 + 0.712X_1 + 0.285X_2 + 0.386X_3$$

The regression equation shows an intercept of 25.116, meaning if all independent variables are zero, the quality of learning is predicted to be 25.116; coefficients: data-driven planning 0.712 (1 unit increase → quality increase 0.712), learning community 0.285 (1 unit → increase 0.285), and academic supervision 0.386 (1 unit → increase 0.386).

Discussion

The Influence of Data-Based Planning on Learning Quality

Data-driven planning has a significant impact on the quality of learning, equipping educators with the ability to identify student needs and adapt teaching strategies. Teacher educators with strong data skills are better prepared to organize, implement, and evaluate data-driven learning. Data plays a crucial role in creating more interactive and adaptive learning methods, thereby enhancing student readiness for various learning situations. Strong data skills among teacher educators are positively correlated with their readiness to integrate data into their learning. Teacher educators with a stronger understanding and skills in data tend to have greater confidence and readiness to use data in their classrooms (Bolhuis, 2019). This is supported by Putra et al. (2025), whose research at SMAIT Ma'had Rabbani showed that systematic implementation of data-based planning increased learning quality by 11.97%. Similarly, Lai & McNaughton (2016) found that structured data use in schools improves teacher decision-making, fosters adaptive instruction, and leads to measurable gains in student learning outcomes.

Teacher educators' teaching readiness is strongly influenced by their level of data skills, where the ability to use data effectively can increase their confidence and ability to design and implement learning (Farrell & Marsh, 2016). This statement is also supported by research by Garner et al. (2017)This statement states that teachers' mastery of data skills has a positive and significant impact on their teaching performance. The higher the level of data skills, the greater the effectiveness and quality of the teaching provided. Data skills have a significant influence on teacher educators' teaching readiness. The higher the mastery of data, the greater the confidence, effectiveness, and quality of their teaching, including in designing, implementing, and evaluating data-based learning (Reeves, 2017).

The Influence of Learning Communities on Learning Quality

Professional learning communities (PLCs) have been recognized as an effective approach to improving the quality of learning across various educational contexts. According to Christensen & Jerrim (2025), teacher involvement in PLCs can increase their job satisfaction, which in turn helps improve instructional quality. PLCs encourage collaboration among teachers, where they can share best practices, discuss teaching challenges, and provide feedback to one another. This creates an environment that supports ongoing professional development and focuses on improving student learning outcomes. Research by Zhang et al. (2023)shows that teacher-centered PLC characteristics, such as "collective inquiry and sharing" and "shared goals and responsibilities," have a significant positive relationship with teacher job satisfaction. When teachers are satisfied with their work environment, they are more likely to be motivated to innovate in their teaching practices. Thus, PLCs not only increase teacher job satisfaction but also have the potential to improve the quality of instruction they provide to students.

However, the impact of PLCs on learning quality is not always consistent. Zheng et al. (2021) Found that while PLCs can improve teacher self-efficacy, their effects on instructional clarity and teaching practices often vary depending on the context. For example, in some studies, collaboration, which is expected to improve teacher self-efficacy, actually showed insignificant results. This suggests that the success of PLCs in improving learning quality depends heavily on how they are implemented and accepted within the existing cultural and structural context. Furthermore, Doğan & Demirbolat (2021) emphasize the importance of reflection within learning communities. Collective reflection within PLCs can help teachers better understand their practices and how they impact student learning. Through reflective dialogue, teachers can identify areas for improvement and

develop more effective strategies to enhance teaching quality. Therefore, the existence of PLCs that encourage reflection and collaboration among teachers is crucial in efforts to improve the quality of learning in schools.

The Influence of Academic Supervision on the Quality of Learning

Effective academic supervision plays a crucial role in improving the quality of learning in schools. Research by Chiwamba et al. (2022) shows that principals who understand their instructional supervision duties can provide better support to teachers. However, a lack of teacher involvement in the supervision process can result in low motivation and low learning quality. This suggests that collaboration between principals and teachers is crucial in building a productive learning environment. Furthermore, Mohamed & Nkomo (2023) emphasize that well-conducted academic supervision can improve teacher performance in public primary schools in Somalia. They found that attendance checks, proper curriculum interpretation, and the use of appropriate teaching methods are key to improving learning quality. However, challenges such as a shortage of supervisory personnel and inadequate training can hinder the effectiveness of supervision, which in turn negatively impacts learning quality.

Research by Musundire & Dreyer (2019) also supports the importance of academic supervision as a tool for improving learning quality. They found that supervision strategies that empower teachers can increase commitment and motivation, which contributes to improved teaching performance. Conversely, inspectional and authoritarian evaluation systems tend to lower teacher morale, thereby reducing teaching effectiveness. Findings from Chaula (2023)indicate that effective communication and collaboration between principals and teachers can strengthen academic supervision practices, generating positive emotions among teachers. However, a lack of teaching materials and administrative burden are negative factors that can weaken supervision practices and lead to negative emotions among teachers.

The Simultaneous Influence of Data-Based Planning, Learning Communities, and Academic Supervision on Learning Quality

The simultaneous relationship between data-driven planning, learning communities, and academic supervision on learning quality demonstrates a mutually reinforcing interaction. The more structured data-driven planning, the more active the learning community in sharing best practices, and the more effective academic supervision in guiding teachers, the higher the quality of learning produced. Data-driven planning is a strategic foundation in efforts to improve learning quality. The

Education Report Platform, as described by Musakirawati et al.(2023), provides comprehensive data that helps schools identify problems, reflect on achievements, and formulate targeted interventions. Wulandari (2021)emphasize that the use of empirical data through the Education Report allows schools to systematically develop quality improvement programs, starting from determining priorities and developing intervention steps, to monitoring and evaluating results. Thus, data-driven planning not only improves decision accuracy but also encourages sustainable improvements in learning quality.

Learning communities provide a structured platform for collaboration between teachers and school leaders in collectively implementing data-driven planning. Within learning communities, teachers collaborate in reviewing the data ecosystem, from school report cards, formative and summative assessment results, to reflection notes during the learning process, under the guidance of school leaders who model appropriate data interpretation. This leadership support and time allocation ensure that data is not only analyzed individually but also discussed in a shared forum, fostering understanding and collective commitment to formulating more targeted follow-up learning (O'Connor & Park, 2023). These results align with previous research by Sari et al. (2025) which states that improving the quality of learning requires a synergistic interaction between effective instructional leadership, strong teacher professional competence, and an active learning community.

According to Zhang et al. (2023), learning communities emphasize ongoing collaboration between teachers through shared reflection on learning practices, analysis of learning outcome data, and a commitment to collective responsibility for student progress. Academic supervision then evolves from mere monitoring and assessment to the role of a learning facilitator, where principals and teachers jointly carry out a cycle of inquiry that includes data-driven problem identification, action planning, intervention implementation, and collaborative and ongoing evaluation of outcomes (Herfiyanti et al., 2024).

Meanwhile, Mailani et al. (2023) reported that principals' academic supervision contributed 34.1% to the variability of learning quality, while teacher professionalism added 77.0%, and both variables simultaneously contributed 44.3%. The results of Suryani et al.'s (2025) research also confirmed that academic supervision had a significant influence of 27.2% higher than pedagogical expertise (18.9%) and a child-friendly school environment (15.2%). Furthermore, Yulistyarini et al. (2024) found a multiple correlation of 0.961 ($p < 0.05$) between principal supervision, school culture,

and teacher work motivation on learning quality.

Simultaneously, the three variables of data-driven planning, learning communities, and academic supervision demonstrate a synergy that strengthens learning quality. Data-driven planning provides an empirical foundation, learning communities foster collaboration and professional capacity, and academic supervision ensures accountability and sustainability of learning practices. This holistic approach enables schools to formulate learning policies and practices that are more focused, consistent in implementation, and responsive to the needs and dynamics of the educational context.

CONCLUSION

The conclusions derived from the research findings and data analysis are as follows: 1) Data-based planning has an 84.2% influence on the quality of learning in Senior High Schools in Pemalang Regency. 2) Learning communities have an 83.3% influence on the quality of learning in Senior High Schools in Pemalang Regency. 3) Academic supervision has an 80.2% influence on the quality of learning in Senior High Schools in Pemalang Regency. 4) Data-based planning, learning communities, and academic supervision together have a 90.2% influence on the quality of learning in Senior High Schools in Pemalang Regency.

REFERENCES

Al-Zahrani, A. M., & Alasmari, T. (2023). Learning Analytics for Data-Driven Decision Making: Enhancing Instructional Personalization and Student Engagement in Online Higher Education. *International Journal of Online Pedagogy and Course Design*, *13*(1), 1–18. https://doi.org/10.4018/IJOPCD.331751

Bolhuis, E. (2019). The Development of Data Use, Data Skills, and a Positive Attitude Towards Data use in A Data Team Intervention for Teacher Educators. *Studies in Educational Evaluation*, *60*, 99–108. https://doi.org/10.1016/j.stueduc.2018.12.002

Chaula, L. (2023). School Heads' Clinical Supervision Practices and Emerging Teacher Emotions in Tanzania Secondary Schools. *Heliyon*, *9*(1). https://doi.org/10.1016/j.heliyon.2023.e13021

Chiwamba, L., Mtitu, A., Kimatu, J., & Ogondiek, J. (2022). Influence of Heads of School Instructional Supervision Practices on Teachers' Work Performance in Public Secondary Schools in Lindi Region-Tanzania. *Journal of Education and Practice*, *13(14)*, 1–8. https://doi.org/10.7176/jep/13-14-01

Christensen, A. A., & Jerrim, J. (2025). Professional Learning Communities and Teacher Outcomes. A Cross-National Analysis. *Teaching and Teacher Education*, *156*, 1–24. https://doi.org/10.1016/j.tate.2024.104920

Damaryanti, R., Sangila, M. S., Boy, L., Kadir, A., & Marlina. (2023). Peran guru dalam implementasi Penilaian Autentik pada Peserta Didik Berdasarkan Kurikulum 2013. *Taksonomi : Jurnal Penelitian Pendidikan Dasar*, *3(1)*, 100–110.

Doğan, E., & Demirbolat, A. O. (2021). Data-driven Decision-Making in Schools Scale: A Study of Validity and Reliability conditions of the Creative Commons Attribution license (CC BY-NC-ND). *International Journal of Curriculum and Instruction*, *13(1)*, 507–523.

Farrell, C. C., & Marsh, J. A. (2016). Contributing conditions: A Qualitative Comparative Analysis of Teachers' Instructional Responses to data. *Teaching and Teacher Education*, *60(1)*, 1–15. https://doi.org/10.1016/j.tate.2016.07.010

Garner, B., Thorne, J. K., & Horn, I. S. (2017). Teachers Interpreting Data for Instructional Decisions: Where Does Equity Come In? *Journal of Educational Administration*, *55*(4), 407–426. https://doi.org/10.1108/JEA-09-2016-0106

Guo, S., Yang, X., Farizan, N. H., & Samsudin, S. (2024). The Analysis of Teaching Quality Evaluation for The College Sports Dance by a Convolutional Neural Network Model and deep learning. In *Heliyon* (Vol. 10, Issue 16). Elsevier Ltd. https://doi.org/10.1016/j.heliyon.2024.e36067

Herawati, E. S. B. (2017). Supervisi dan Pengawasan Pendidikan. *SINAU: Jurnal Penelitian Pendidikan*, *3(1)*, 449–474. https://www.researchgate.net/publication/356584562

Herfiyanti, N., Setiyanti, W., & Wulandari, A. (2024). Peningkatan mutu sekolah dengan perencanaan berbasis data rapor pendidikan. *Learning: Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *4(3)*, 508–512. https://doi.org/10.1002/ss.374

Hidayah, E., Sofiyanti, E., Inayah, & Nyoman, N. A. (2025). Perencanaan Berbasis Data Rapor Pendidikan Sebagai Upaya Strategis untuk Meningkatkan Mutu Sekolah. *Learning: Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *5(1)*, 16–23.

Indartini, M., & Mutmainah. (2024). *Analisis Data Kuantitatif: Uji Instrumen, Uji Asumsi Klasik, Uji Korelasi dan Regresi Linier Berganda*. Klaten: Penerbit Lakeisha.

Jaekel, A. K., Scheiter, K., & Göllner, R. (2021). Distance Teaching During the COVID-19 Crisis: Social Connectedness Matters Most for Teaching Quality and Students' Learning. *AERA Open*, *7(1)*, 1–14. https://doi.org/10.1177/23328584211052050

Kiriana, I. N., Widiasih, N. N. S., & Sena, I. G. M. W. (2022). Peran Guru Penggerak dalam Meningkatkan Kualitas Pembelajaran Pendidikan Agama Hindu. *Jurnal Penjamin Mutu*, *8(1)*, 66–73. http://ojs.uhnsugriwa.ac.id/index.php/JPM

Lai, M. K., & McNaughton, S. (2016). The Impact of Data use Professional Development on Student Achievement. *Teaching and Teacher Education*, *30*(1), 1–10. https://doi.org/10.1016/j.tate.2016.07.005

Mailani, I., Nazir, M., & Zein, ud. (2023). Pengaruh Supervisi Akademik Kepala Sekolah dan Profesionalitas Guru terhadap Kualitas Pembelajaran. *Jurnal Kependidikan*, *12(4)*, 1061–1075. https://jurnaldidaktika.org

Mohamed, A. A., & Nkomo, N. N. (2023). Instructional Supervision and Improved Teaching Performance for Public Primary Schools in Somalia. *International Journal of Education and Evaluation*, *9*(3), 100–105. https://doi.org/10.56201/ijee.v9.no3.2023.pg100.105

Musakirawati, J., Anggriawan, F., Triansyah, F. A., & Akib, A. T. (2023). Pemanfaatan Platform Rapor Pendidikan Indonesia terhadap Perencanaan Berbasis Data. *Jurnal Dinamika Manajemen Pendidikan (JDMP)*, *7(2)*, 201–208. https://doi.org/10.26740/jdmp.v7n2.p201-10

Musundire, A., & Dreyer, J. M. (2019). Effectiveness of the Clinical Supervision Strategy as a Tool for Improving Teaching Quality: Perceptions of South African School-Based Managers and Educators. In *Africa Education Review: Vol. 16(2)* (pp. 109–125). Routledge. https://doi.org/10.1080/18146627.2018.1454841

Nuryadi, Astuti, T. D., Utami, E. S., & Budiantara, M. (2017). *Dasar-dasar Statistik Penelitian (Cet. ke-1)*. Yogyakarta: Sibuku Media. www.sibuku.com

O'Connor, B., & Park, M. (2023). Exploring the Influence of Collaborative Data-based Decision Making Among Teachers in Professional Learning Communities on Teaching Practice. *Disciplinary and Interdisciplinary Science Education Research*, *5(17)*, 1–13. https://doi.org/10.1186/s43031-023-00086-1

Praetorius, A. K., Klieme, E., Herbert, B., & Pinger, P. (2018). Generic Dimensions of Teaching Quality: the German framework of Three Basic Dimensions. *ZDM - Mathematics Education*, *50*(3), 407–426. https://doi.org/10.1007/s11858-018-0918-4

Putra, W., Syamsir, Sujirman, Asha, L., & Warlizasusi, J. (2025). Improving Learning Quality and Student Numeracy Through Data-Driven Planning at SMAIT Ma'had Rabbani. *Islamic Management: Jurnal Manajemen Pendidikan Islam*, *8*(1), 451–462. https://doi.org/10.30868/im.v7i02.7713

Rachmawati, R., & Fitria, H. (2024). The Influence of the School's Culture and Principal's Academic Supervision on the Teaching Quality of High School Teachers. *Journal of Social Work and Science Education*, *5*(3), 808–821.

Reeves, T. D. (2017). Pre-service Teachers' Data use Opportunities During Student Teaching. *Teaching and Teacher Education*, *63*, 263–273. https://doi.org/10.1016/j.tate.2017.01.003

Rusdiman Ab. (2025). *Model Supervisi Akademik Versi Profesional Learning Community (PLC)*. Medan: UMSU Press.

Sari, A., Bunyamin, B., & Sudana, I. M. (2025). The Influence of Instructional Leadership, Professional Competence, and Learning Communities on the Quality of Public Elementary Schools. *Scaffolding: Jurnal Pendidikan Islam dan Multikulturalisme*, *7*(2), 161–183. https://doi.org/10.37680/scaffolding.v7i2.7472

Schildkamp, K. (2019). Data-based Decision-Making for School Improvement: Research Insights and Gaps. *Educational Research*, *61*(3), 257–273. https://doi.org/10.1080/00131881.2019.1625716

Singerin, S. (2021). The Impact of Academic Supervision on Teacher Pedagogical Competence and Teacher Performance: The Role of Moderating by Teacher Efficacy. *International Journal of Elementary Education*, *5*(3), 496–504. https://ejournal.undiksha.ac.id/index.php/IJEE

Sudirman, I., Sakdiyah, H., & Qomariyah, N. (2024). Dampak Supervisi Akademik terhadap Profesionalisme Guru PAI dalam Meningkatkan Kualitas Pembelajaran. *Modeling: Jurnal Program Studi PGMI*, *11 (1)*, 1358–1363.

Sugiyono. (2022). *Metode Penelitian Kuantitatif (Edisi ke-3).* Bandung: Alfabeta.

Suryani, Y., Yuliejantiningsih, Y., & Prayito, M. (2025). Pengaruh Supervisi Akademik, Kompetensi Pedagogik Guru dan Budaya Sekolah Ramah Anak terhadap Kualitas Pembelajaran. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *10(1)*, 221–235.

Widiyanto. (2018). Revitalisasi Komunitas Pembelajaran dengan Lesson Study dalam Meningkatkan Kualitas Pembelajaran. *Inopendas: Jurnal Ilmiah Kependidikan*, *1(1)*, 16–27. https://doi.org/10.24176/jino.v1i1.2312

Widiyawati, T. E., Sa'adah, N., & Nurkolis. (2025). Perencanaan Berbasis Data melalui Rapor Pendidikan dalam Penyusunan RKAS di Sekolah Dasar. *Janacitta: Journal of Primary and Children's Education*, *8(1)*, 22–26. http://jurnal.unw.ac.id/index.php/janacitta

Wulandari, D. Y. (2021). Studi tentang Pengaruh Supervisi Akademik Pengawas Sekolah dan Profesionalisme Guru terhadap Kualitas Pembelajaran di SMK Negeri 1 Cipeundeuy. *Jurnal Pendidikan Manajemen Perkantoran*, *6(1)*, 83–93. https://doi.org/10.17509/jpm.v4i2.18008

Yulistyarini, A., Egar, N., & Abdullah, G. (2024). Pengaruh Supervisi Kepala Sekolah, Budaya Sekolah, Dan Motivasi Kerja Guru Terhadap Mutu Pembelajaran SMP Negeri di Sub Rayon 01 Kabupaten Pekalongan. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *9(4)*, 937–952.

Zhang, J., Yin, H., & Wang, T. (2023). Exploring the Effects of Professional Learning Communities

on Teachers' Self-Efficacy and job Satisfaction in Shanghai, China. *Educational Studies*, *49*(1), 17–34. https://doi.org/10.1080/03055698.2020.1834357

Zheng, X., Yin, H., & Liu, Y. (2021). Are Professional Learning Communities Beneficial for Teachers? A Multilevel Analysis of Teacher Self-Efficacy and Commitment in China. *School Effectiveness and School Improvement*, *32*(2), 197–217. https://doi.org/10.1080/09243453.2020.1808484