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ARTICLE

Igniting Lerning: How Leadership and Teaching Prowess Transform Primary Schools in Pedurungan, Semarang.

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Abstract

The quality of primary education is a fundamental determinant of individual life trajectories and national development. This research aims to analyze the partial and simultaneous impact of principals' instructional leadership and teachers' pedagogical competence on learning quality of elementary schools in Kecamatan Pedurungan of Semarang. Employing a quantitative, explanatory research design, the study involved 389 elementary school teachers, from whom a sample of 197 was designated using the Slovin formula and proportional random sampling. Data were collected via questionnaires and analyzed using multiple linear regression. The findings reveal that principals' instructional leadership and teachers' pedagogical competence significantly affect learning quality of elementary schools, both partially and simultaneously. The robust correlation, quantified at 77.9%, between the synergistic influence of instructional leadership and pedagogical competence on learning quality carries profound implications for educational practice and policy. Effective instructional leadership transcends mere administrative oversight; it encompasses the proactive engagement of school leaders in curriculum development, instructional supervision, and the professional growth of educators. Concurrently, pedagogical competence refers to an educator's proficiency in planning, executing, and evaluating instruction.

Keywords: Learning quality, instructional leadership, Pedagogical Competence

1. Introduction

The quality of primary education is a fundamental determinant of individual life trajectories and national development. Beyond the simple accumulation of information, a robust educational system furnishes individuals with critical thinking skills, problem-solving capabilities, and the aptitude for continuous learning, all indispensable for navigating the intricacies of the 21st century ([1]).

The efficacy of an educational setting is principally determined by the quality of its teaching and learning processes. In this context, [2] define instructional quality as a measure of the excellence of teacher-student interaction during the learning process, specifically as it contributes to the attain-

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ment of defined educational outcomes

The successful attainment of learning objectives serves as a key indicator of high-quality learning. This indicator is situated within the standards for the learning process, a critical variable that warrants careful consideration to produce graduates with competitive capabilities ([3]).

High-quality learning forms the cornerstone of effective education, influencing how students interact with and comprehend new information (UNESCO, 2025). This process extends beyond mere knowledge retention; it encompasses the cultivation of essential cognitive, emotional, and social competencies crucial for students' continued growth and success throughout their academic careers. Fundamentally, quality learning necessitates the establishment of learning environments that are inclusive, equitable, and conducive to support, employing pertinent and contextually relevant curricula to address the varied requirements of all learners.

The notion of learning quality encompasses the efficacy of pedagogical approaches, the profundity of student understanding, and the cultivation of crucial proficiencies ([4]). Consequently, a multitude of factors contribute to the attainment of this overarching objective. Among these, two critical elements consistently emerge as central determinants: the instructional leadership demonstrated by school principals ([5]; [6]; [7]; [8]; [9]; [3]) and the pedagogical expertise exhibited by teachers ([10]; [11]; [12]; [13]; [14]; [15]).

Based on initial observations, the learning quality in public elementary schools within Pedurungan District remains suboptimal in 2024. This is evident from data revealing that out of 13 public elementary schools, only four showed an improvement in their achievement scores. The majority, comprising nine schools, experienced a decline or stagnation in their learning quality scores. Therefore, it's clear there's a significant issue with learning quality in Pedurungan District's public elementary schools that requires serious attention. These observations are supported by the education report, specifically from the learning quality assessment aspect (D.1), as detailed in the table below:

Table 1. Overview of Achievement Scores

No.	Schools	Achievement Scores		Rank	Remark
		2023	2024		
1	SD N Gemah	72,65	73,59	Top Rank	Improved
2	SD N Kalicari 1	62,51	61,3	Mediocre	Decline
3	SD N Kalicari 2	68,55	69,67	Mediocre	Improved
4	SD N Kalicari 3	74,32	73,59	Mediocre	Decline
5	SD N Muktiharjo 1	62,12	61,3	Mediocre	Decline
6	SD N Muktiharjo 2	70,21	69,67	Mediocre	Decline
7	SD N Muktiharjo 3	72,35	71,32	Top Rank	Decline
8	SD N Palebon 1	73,52	72,15	Mediocre	Decline
9	SD N Palebon 2	7,86	7	Mediocre	Decline
10	SD N Palebon 3	62,51	60,32	Low	Decline
11	SD N Pedurungan Lor 1	64,52	65,39	Mediocre	Improved
12	SD N Pedurungan Kidul 1	58,62	59,15	Top Rank	Improved
13	SD N Pedurungan Kidul 2	66,52	65,03	Mediocre	Decline

A significant factor in elevating the quality of learning for teachers is the instructional leadership provided by the school principal. The principal's active engagement in instructional leadership is indispensable for fostering teachers' pedagogical competence and, consequently, improving the overall learning quality at the institution. This perspective resonates with [16], who states that the efficacy of education and learning within a school is considerably influenced by the principal's capacity to effectively administer all school components. Instructional leadership, as manifested by school principals, plays a foundational role in cultivating a conducive learning environment. Principals are not

merely administrative figures; they are instructional leaders who set the vision, foster a culture of academic excellence, and provide the necessary resources and support for effective teaching and learning. Their ability to articulate clear educational goals, monitor curriculum implementation, and provide constructive feedback to teachers directly impacts the quality of instruction. A principal who actively engages with teachers on pedagogical matters, promotes professional development opportunities, and champions innovative teaching practices is more likely to inspire a highly motivated and effective teaching staff.

Furthermore, the principal's instructional leadership extends to creating a supportive and collaborative atmosphere within the school. When principals prioritize professional learning communities, encourage peer observation, and facilitate the sharing of best practices, teachers are empowered to refine their skills and adapt their approaches to better meet student needs. This supportive environment fosters a sense of collective responsibility for student success, wherein teachers feel valued and are more willing to invest in their own pedagogical growth. Conversely, a lack of clear instructional direction or insufficient support from leadership can lead to teacher disengagement and a decline in instructional quality.

Complementing the influence of instructional leadership is the indispensable role of teachers' pedagogical competence. Pedagogical competence refers to a teacher's comprehensive understanding of teaching theories, instructional strategies, assessment methods, and the ability to apply this knowledge effectively in the classroom. This encompasses their capacity to design engaging lessons, differentiate instruction to cater to diverse learners, manage classroom dynamics, and accurately assess student progress. Teachers with strong pedagogical competence are adept at creating dynamic and student-centered learning experiences that go beyond rote memorization, fostering critical thinking, problem-solving, and creativity.

Traditionally, research on school effectiveness has often focused on isolated variables, such as curriculum design, resource allocation, or teacher qualifications. However, a more holistic perspective reveals that the synergy between leadership and teaching is what truly distinguishes high-performing primary schools. Effective school leaders cultivate a culture of high expectations, provide necessary resources, and foster a supportive environment where teachers feel empowered and professionally respected. Simultaneously, teachers with profound pedagogical competence translate this supportive culture into engaging classroom experiences, adapting their methods to diverse learning needs and inspiring a genuine love for learning among their students. This paper posits that these two elements are not merely additive but multiply each other's impact, creating a powerful ecosystem for educational transformation.

Previous scholarly endeavors have extensively explored the individual contributions of instructional leadership and teacher competence to educational effectiveness. For instance, numerous studies highlight how strong instructional leadership—characterized by curriculum guidance, teacher development, and a focus on pedagogical improvement—positively correlates with teacher efficacy and student performance ([6]; [8];[7]; [4]; [17]). Similarly, the vital role of teachers' pedagogical competence, encompassing their mastery of teaching methods, classroom management, and assessment strategies, has been well-established as a direct predictor of student engagement and academic achievement ([18];[11]; [19]; [14]). These individual lines of inquiry provide a solid foundation for understanding the mechanisms through which these factors influence learning.

This paper will explore the intricate mechanisms through which robust leadership practices and exemplary teaching competencies collaboratively foster an environment conducive to deep and sustained learning in primary schools. By examining recent literature and conceptual frameworks, we aim to delineate the specific behaviors and strategies employed by leaders and teachers that contribute to this transformative process. Ultimately, this work seeks to provide actionable insights for

educational stakeholders, emphasizing that sustained improvements in primary education necessitate a concerted focus on empowering both school leaders and teachers, recognizing their intertwined roles in igniting learning and shaping the future of young minds.

Instructional leadership performed by the principals and teachers' pedagogival competence collaboratively foster an environment conducive to deep and sustained learning in primary schools. By such a reason, the author wants to prove whether it is true that instructional leadership and teachers' pedagogical competence can influence learning quality both partially and simultaneously. Based on the theory and observations described above, the author is interested in conducting research with the title *"Igniting Learning: How Leadership and Teaching Prowess Transform Primary Schools"*.

2. Methods

This study employed a quantitative approach with a correlational design. It falls under the category of explanatory research, which aims to identify the influential relationships between two or more variables.

The study's population comprised all 389 public elementary school teachers in Pedurungan District, Semarang City. A sample of 197 teachers was determined using the Slovin formula. Proportional random sampling was the chosen technique for sample selection, ensuring each stratum within the population was represented in the sample in the same proportion as its representation in the overall population.

Data collection was carried out using a questionnaire technique, which assessed learning quality, instructional leadership, and pedagogical competence. Measurements within the questionnaire utilized a 5-point Likert scale. Learning quality is evaluated across three primary dimensions: classroom management, psychological support, and learning methods ([20]). Instructional leadership is measured through four key dimensions: formulating school vision, mission, and objectives, managing instructional programs, fostering a conducive learning climate, and establishing academic standards ([5]; [21]). Pedagogical competence is assessed using four dimensions: understanding student characteristics, ability to design learning activities, implementing learning, and ability to evaluate learning outcomes (Government Regulation No. 74 of 2008). The instrumentation for these constructs is summarized as follows.

Table 2. The Instrumentation Constructs

Variable	Dimensions	Items
Learning Quality	1. Classroom management	8
	2. Psychological support	10
	3. Learning methods	16
	Total items	**34**
Instructional Leadership	1. Formulating school vision, mission, and objectives	9
	2. Managing instructional programs	9
	3. Fostering a conducive learning climate	9
	4. Establishing academic standards	9
	Total items	**36**
Pedagogical Competence	1. Understanding student characteristics	9
	2. Ability to design learning activities	7
	3. Implementing learning	8
	4. Ability to evaluate learning outcomes	8
	Total items	**32**

Prior to the main study, the research instruments underwent a pilot test with a sample of 30 respondents drawn from the same population as the primary research. This pilot testing was conducted to establish the validity and reliability of the instruments.

Based on the analysis, all instruments demonstrated strong psychometric properties. The Learning Quality instrument, initially comprising 34 items, had 33 valid items, resulting in a final count of 33 items and a Cronbach's Alpha of 0.925, indicating high reliability. Similarly, the Instructional Leadership instrument, starting with 36 items, yielded 34 valid items (2 invalid), resulting in 34 final items and a Cronbach's Alpha of 0.921, also confirming its reliability. Finally, the Pedagogical Competence instrument's initial 32 items were all found to be valid, maintaining 32 items with a robust Cronbach's Alpha of 0.918, thus affirming its reliability. These results confirm that the instruments are suitable for data collection within this research. The outcomes of these validation and reliability analyses are summarized in the table below:

Table 3. The Summary of Instruments Validity and Reliability Tests

Instrument	Initial Items Total	Valid/Invalid		Final Items	Reliability (Cronbach Alpha)	Remark
		Valid	Invld			
Learning Quality	34	33	1	33	0.925	Reliable
Instructional Leadership	36	34	2	34	0.921	Reliable
Pedagogical Competence	32	32	0	32	0.918	Reliable

Data analysis in this study will be conducted using multiple linear regression with two predictors. As defined by [22], multiple linear regression is a statistical method employed to simultaneously examine the influence of several independent variables on a single dependent variable. The main objectives of this analysis are to quantify the collective influence of the independent variables on the dependent variable and to predict the dependent variable's value using the known values of the independent variables. The formula can be drawn as follows:

$$\hat{Y} = a + b_1 X_1 + b_2 X_2 + \varepsilon \quad ([22]) \tag{1}$$

Instructional leadership, primarily enacted by the school principal, plays a pivotal role in shaping the overall learning environment and consequently, the quality of education. A principal who actively engages in instructional leadership fosters a culture of continuous improvement by setting clear academic goals, providing adequate resources, and offering constructive feedback to teachers. This proactive approach ensures that pedagogical practices are aligned with institutional objectives and student needs, thereby enhancing the effectiveness of curriculum delivery and student engagement. Furthermore, strong instructional leadership cultivates a supportive atmosphere for professional development, encouraging teachers to refine their skills and adopt innovative teaching methodologies, which directly contributes to a higher standard of learning outcomes.

Complementing effective instructional leadership, teachers' pedagogic competence is equally crucial for achieving high-quality learning. Pedagogic competence encompasses a teacher's profound understanding of subject matter, their ability to design and deliver engaging lessons, and their skill in assessing student learning and providing targeted support. When teachers possess high levels of pedagogic competence, they are better equipped to adapt their teaching strategies to diverse student needs, create stimulating classroom environments, and promote critical thinking and problem-solving skills. The synergy between a principal's instructional leadership, which provides direction and support, and teachers' robust pedagogic competence, which translates vision into effective classroom practice, creates a powerful framework for fostering a dynamic and high-quality learning experience for all students. The combination correlation among these three variables in the research can be visualized in the following thinking framework diagram.

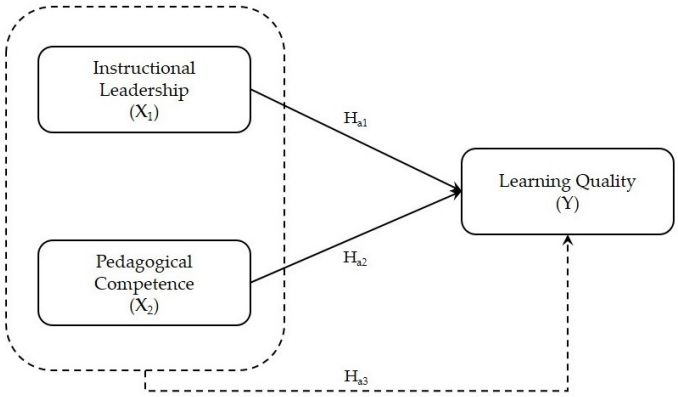

Figure 1. The Framework Diagram of the Research

Before proceeding with regression analysis, it's essential to conduct assumption tests, specifically the Best Linear Unbiased Estimator (BLUE) analysis. According to [22], BLUE refers to a statistical method that yields the best linear, unbiased estimates with the smallest variance within a regression model.

3. Results and Discussion

Data Description

This research obtained its data from a sample of 197 public elementary school teachers in Pedurungan District of Semarang City. The data collection was facilitated through the dissemination of questionnaires, capturing three primary aspects: respondents' perceptions of learning quality in their individual schools, their perceptions on the instructional leadership exhibited by their school principals, and their self-assessment of pedagogical competence as applied during the teaching and learning process. A concise overview of these data is presented in the subsequent table.

Table 4. The Summary of Descriptive Analysis

Variable	Descriptor	Statistics Value
4=Learning Quality (Y)	Mean	120.27
	Std. Dev.	18.923
	Max.	161.0
	Min.	75.0
4=Instructional Leadership (X_1)	Mean	119.81
	Std. Dev.	18.606
	Max.	163.0
	Min.	80.0
4=Pedagogical Competence (X_2)	Mean	119.34
	Std. Dev.	18.484
	Max.	158.0
	Min.	78.0

The data presented in the table above demonstrate a score range from a minimum of 75 to a maximum of 161. For the variable of learning quality, the average score was determined to be 120.27, with a standard deviation of 18.923. Crucially, since the average learning quality score falls within the 109-125 interval—designated as a "moderate" criterion—it can be reasonably concluded that teachers'

perceptions regarding learning quality in public elementary schools within Pedurungan District, Semarang, are generally considered to be in the fairly good category.

The data summary presented in the table above, focusing on teachers' perceptions of principals' instructional leadership, demonstrates a minimum observed score of 80 and a maximum observed score of 163. The mean score for instructional leadership was calculated to be 119.81, accompanied by a standard deviation of 18.606. As the mean score for perceptions of instructional leadership aligns with the 114-130 interval, representing a "moderate" criterion, it can be reasonably deduced that teachers' perceptions of principals' instructional leadership within the public elementary schools of Pedurungan District, Semarang, are classified as moderately positive.

Analysis of the data pertaining to teachers' self-assessment of their individual pedagogical competence, as displayed in the aforementioned table, revealed a minimum score of 78 and a maximum score of 158. Specifically, the average score for self-assessed pedagogical competence was calculated at 119.34, accompanied by a standard deviation of 18.484. Since this average score is situated within the 110-125 range, which corresponds to a "moderate" criterion, it is therefore inferable that the pedagogical competence of teachers in state elementary schools in Pedurungan District, Semarang, falls into the sufficiently positive category.

Data Analysis

The analytical approach involved multiple linear regression. Before proceeding with the primary analysis, preliminary assumption tests were conducted to ensure the validity of the regression model. The findings from these diagnostic tests are presented in the subsequent sections.

Assumption Tests

For regression estimates to achieve BLUE (Best, Linear, Unbiased, Estimator) properties, specific assumptions must be met ([22]). Consequently, a series of assumption tests were performed, including: (1) normality testing, (2) verifying the linearity of parameters within the regression model, (3) assessing for multicollinearity, and (4) examining heteroscedasticity. The findings from these diagnostic evaluations are presented in the subsequent section.

Normal Test

The normality test aims to determine whether the data used are normally distributed ([22]). This test was conducted using the Kolmogorov-Smirnov Test. The results of this analysis are presented below.

Table 5. The Summary of Normal Test Results

2*Variable	Z	2*Sig.	2*Remark
	Kolmogorov-Smirnov		
Learning Quality	0.728	0.664	Normal
Instructional Leadership	0.825	0.504	Normal
Pedagogic Competence	0.707	0.700	Normal

Based on the data presented in the table above, the Kolmogorov-Smirnov Z coefficients for the variables of learning quality, instructional leadership, and pedagogical competence were found to be 0.728 (sig. 0.664), 0.825 (sig. 0.504), and 0.707 (sig. 0.700), respectively. As all significance values (p) are greater than 0.05, it can be concluded that the data for each variable originate from a normally distributed population. Therefore, the normality assumption for this study is met.

Linearity Test

To confirm the presence of a linear correlation within the regression model, a linearity test was performed. The analysis revealed that the F-test for each independent variable against the dependent variable yielded a p-value greater than 0.05. This finding indicates that the linear regression model

is appropriate and can be utilized to predict work motivation (Y). The results of this linearity test are summarized in the table below.

Table 6. The Summary of Linearity Tests

No.	Variable	F (Sig. p)	Remark
1.	Instructional Leadership and Learning Quality	1.991 (0.060)	Linear
2.	Pedagogic Competence and Learning Quality	1.884 (0.081)	Linear

As summarized in the linearity test table, the analysis revealed an F-statistic of 1.991 (p = 0.060) for the relationship between Instructional Leadership and Learning Quality. Similarly, the linearity test for Pedagogic Competence and Learning Quality produced an F-statistic of 1.884 (p = 0.081). Since both significance values (p) exceed the 0.05 threshold, these findings indicate a linear relationship between Instructional Leadership and Learning Quality, as well as between Pedagogic Competence and Learning Quality.

Multicolinearity Test

As posited by [22], the multicollinearity test serves to evaluate if there is an unacceptable level of correlation among the independent variables in a regression framework. A robust regression model should not exhibit significant correlation among its independent variables, as high correlation can lead to misinterpretation and impede the validity of the analysis results. The test results can be summarized in the following table.

Table 7. The Summary of Multicollinearity Test

No.	Variable	VIF	Tolerance	Remark
1.	Instructional Leadership	4.887	0.205	Non Multicollinear
2.	Pedagogic Competence	4.887	0.205	Non Multicollinear

The analysis revealed that the Variance Inflation Factor (VIF) for each independent variable was 4.887 (Instructional Leadership and Pedagogic Competence). Both values are well below 10, the common threshold for concern. Additionally, the tolerance values for both independent variables were 0.205, which is greater than 0.1.

Heteroscedasticity Test

The heteroscedasticity test, according to [22], aims to detect unequal variances of residuals across observations within a regression model. The test was done using Glejser Test. An ideal regression model should exhibit homoscedasticity, meaning the residual variance remains consistent across all observations. The results of this test are summarized in the following table.

Table 8. The Summary of Heteroscedasticity Test

No.	Variable	t	Sig. p	Remark
1.	Instructional Leadership	1.337	0.183	No Heteroscedasticity
2.	Pedagogic Competence	-0.148	0.882	No Heteroscedasticity

The test results indicate that none of the independent variables are statistically significant. Specifically, Instructional Leadership showed a t-statistic of 1.337 (p = 0.183), and Pedagogic Competence

yielded a t-statistic of -0.148 (p = 0.882). Since the p-values for both variables are greater than 0.05, we can conclude that the regression model does not exhibit heteroscedasticity.

Hypothesis Test

In this study, hypothesis testing was conducted using multiple linear regression analysis with two predictor variables. The general equation for multiple linear regression is as follows:

$$Y = \beta X + bX + e \quad \text{(Ghozali, 2021, p.76[22])} \tag{2}$$

The subsequent table presents a concise summary of the findings derived from the multiple linear regression analysis:

Table 9. The Summary of Regression Analysis

Model	β	***t***	***p***
Constant	9.795	2.288	0.023
Instructional Leadership	0.321	4.231	0.000
Pedagogical Competence	0.603	7.899	0.000
R^2 : 0.779 F : 341.843 Sig. : 0.000	R : 0.883		

Referring to the summarized results of the multiple linear regression analysis presented in the table above, the following model equation can be derived:

$$\hat{Y} = 9.795 + 0.321X_1 + 0.603X_2 + e \tag{3}$$

The model previously discussed reveals that all generated regression coefficients are positive. Consequently, it can be concluded that both predictor variables, Instructional Leadership (X1) and Pedagogical Competence (X2), exert a direct or positive influence on the dependent variable, Learning Quality (Y). This implies that an increase in either Instructional Leadership or Pedagogical Competence is associated with a corresponding improvement in Learning Quality. Conversely, a decrease in these variables is linked to a decline in Learning Quality.

In examining the isolated impact of Instructional Leadership (X1) on Learning Quality (Y), the statistical analysis yielded a t-statistic of 4.231 (Sig. < 0.05). Since p-value < 0.05, the data provide sufficient evidence to reject the null hypothesis (H0) in favor of accepting the alternative hypothesis (Ha). Therefore, it is definitively established that Instructional Leadership (X1) has a statistically significant and direct positive partial effect on Learning Quality (Y). The positive sign of the regression coefficient () corroborates this, signifying that enhanced instructional leadership corresponds to an uplift in learning quality, while diminished instructional leadership is associated with a decrement in learning quality.

The partial effect of Pedagogical Competence (X2) on Learning Quality (Y) was analyzed, yielding a t-statistic of 7.899 with a significance level (p) of 0.000. Given that p<0.05, the null hypothesis (H0) is rejected, and the alternative hypothesis (Ha) is accepted. Consequently, it's concluded that Pedagogical Competence (X2) has a statistically significant and positive partial influence on Learning Quality (Y). The positive value of the regression coefficient () further confirms this positive relationship, indicating that an increase in Pedagogical Competence is associated with an improvement in

Learning Quality, and conversely, a decrease in Pedagogical Competence is linked to a decline in Learning Quality.

The simultaneous impact of Instructional Leadership (X1) and Pedagogical Competence (X2) on Learning Quality (Y) was analyzed, yielding an F-statistic of 341.843 (Sig. $p < 0.05$). As $p < 0.05$, the null hypothesis (H0) is rejected, and the alternative hypothesis (Ha) is accepted. This indicates a statistically significant and positive simultaneous influence of Instructional Leadership (X1) and Pedagogical Competence (X2) on Learning Quality (Y).

A coefficient of determination (R2) of 0.779 indicates the magnitude of the simultaneous impact of Instructional Leadership (X1) and Pedagogical Competence (X2) on Learning Quality (Y). Consequently, 77.90% of the variability in Learning Quality (Y) can be explained by the combined effect of Instructional Leadership (X1) and Pedagogical Competence (X2). The residual 22.10% of this variability is influenced by other variables not incorporated within this analytical model.

In regression analysis, effective contribution refers to the extent to which each independent variable (or predictor) contributes to or plays a role in explaining the dependent variable (or criterion). In simpler terms, it quantifies how significant the influence of each independent variable is in accounting for the variation observed in the dependent variable ([23]). The Effective Contribution (EC) of each independent variable to work motivation in this study can be calculated using the following formulas:

$$\mathrm{SE}(X)\% = \beta(X_1) \times r(X_1) \times 100\% \quad \text{(Jackson, 1991 [24])} \tag{4}$$

The following table summarizes the effective contributions of the independent variables, Instructional Leadership and Pedagogical Competence, to the dependent variable, Learning Quality (Y). Notably, Pedagogical Competence demonstrated a more substantial effective contribution (51.30%) compared to Instructional Leadership (26.60%), with a combined total contribution of 77.90%.

Table 10. The Summary of Effective Contribution of Independent Variables to Dependent Variable

2***Variables**	**Standardized β**	**Partial Correlation Coefficient (*r*)**	**Effective Contribution (EC%)**
Instructional Leadership	0.316	0.841	26.60%
Pedagogical Competence	0.589	0.871	51.30%
Total			77.90%

The Relative Contribution (RC) of each independent variable to work motivation in this study can be calculated using the following formulas:

$$\mathrm{SR}(X)\% = \frac{\mathrm{SE}(X)}{\mathrm{R}^2} \times 100\% \quad \text{(Jackson, 1991 [24])} \tag{5}$$

The table below summarizes the relative contributions of the independent variables to Learning Quality (Y). Instructional Leadership accounts for 34.15% of the total relative contribution, while Pedagogical Competence contributes the majority at 65.85%. These figures are derived from their respective effective contributions (26.60% and 51.30%) and the overall coefficient of determination (0.779, or 77.9% of variance explained).

Table 11. Contribution Analysis of Independent Variables

Variables	Effective Contribution (EC%)	Determination Coefficient (R^2)	Relative Contribution (RC%)
Instructional Leadership	26.60%		34.15%
Pedagogical Competence	51.30%	0.779	65.85%
Total			100.00%

4. Conclusion

The analysis definitively concludes that instructional leadership and teachers' pedagogical competence exert a statistically significant and positive effect on learning quality in State Elementary Schools in Pedurungan District, Semarang City, both when assessed independently and concurrently. Instructional leadership significantly impacts teachers' pedagogical competence by fostering a supportive environment for professional development. Meanwhile, teachers' pedagogical competence directly influences the quality of the learning process and student outcomes. The synergistic combination of robust instructional leadership and highly competent teachers acts as a powerful catalyst for enhancing learning quality. Ultimately, instructional leaders cultivate an environment where pedagogical excellence is both valued and continuously pursued.

This study's findings, while robust, open several avenues for future research to further deepen our understanding of learning quality in primary education. Longitudinal studies would be particularly valuable to observe how changes in instructional leadership and teachers' pedagogical competence evolve over time and their long-term impact on student learning outcomes. This approach could capture the dynamic interplay between these variables and identify causal relationships more definitively. Furthermore, qualitative follow-up studies employing methods such as in-depth interviews with school leaders and teachers, classroom observations, and focus group discussions would provide richer, nuanced insights into the 'how' and 'why' behind the observed statistical relationships. Such qualitative research could uncover specific leadership practices that foster pedagogical competence and the practical challenges teachers face in implementing effective pedagogical strategies. Examining the perspectives of students themselves could also offer a more comprehensive view of learning quality.

Based on the definitive conclusion that both instructional leadership and teachers' pedagogical competence significantly and positively impact learning quality, the following policy recommendations are put forth: (1) Educational authorities, specifically the Semarang City Education Office, should implement mandatory, credit-bearing professional development programs that are specifically tailored to enhance instructional leadership skills for principals and pedagogical competence for teachers in State Elementary Schools in Pedurungan District. These programs should move beyond generic training to focus on practical, evidence-based strategies, such as instructional coaching, collaborative lesson planning, and data-driven decision-making for leaders, and differentiated instruction, formative assessment, and digital literacy for teachers; and (2) The local education agency should develop and implement a performance-based incentive system that recognizes and rewards both school leaders who demonstrate effective instructional leadership and teachers who consistently exhibit high pedagogical competence and contribute to improved learning quality. Alongside incentives, a ro-

bust mentorship program should be established, pairing highly competent, experienced teachers with newer or less experienced colleagues, facilitated and overseen by instructional leaders.

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