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Contribution of Principal Leadership and School Culture Through Teacher Performance to School Quality

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ABSTRACT*:*
This study aims to examine the direct and indirect impacts of school culture and principal leadership on school quality as measured by teacher performance in Wonosobo Regency, Central Java Province. The main problem in this study is how the relationship between school culture, principal leadership, and teacher performance in shaping school character. This study uses a quantitative approach with a path analysis method to evaluate the relationship between these variables. The research subjects consisted of 91 participants who were prospective teachers from the sixth group in Wonosobo Regency. Data analysis techniques included classical assumption tests, path analysis with trimming techniques, and the Sobel test to test the mediation effect. The results indicate that principal leadership does not directly affect teacher performance, but is directly influenced by school culture. Teacher effectiveness is the result of the combined influence of school culture and principal leadership. In addition, school culture, principal leadership, and teacher performance contribute to the formation of school character. Teacher performance acts as a direct mediator between principal leadership and school character, as well as an additional mediator between school culture and school character. The conclusion of this study emphasizes the importance of strengthening school culture and the role of teacher performance in improving the quality of school character..

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KEYWORDS*:*
Leadership, School Culture, School Quality, Teacher Performance.

ABSTRAK:

Penelitian ini bertujuan untuk mengkaji dampak langsung dan tidak langsung dari budaya sekolah dan kepemimpinan kepala sekolah terhadap kualitas sekolah yang diukur melalui kinerja guru di Kabupaten Wonosobo, Provinsi Jawa Tengah. Masalah utama dalam penelitian ini adalah bagaimana hubungan antara budaya

sekolah, kepemimpinan kepala sekolah, dan kinerja guru dalam membentuk karakter sekolah. Penelitian ini menggunakan pendekatan kuantitatif dengan metode analisis jalur untuk mengevaluasi hubungan antara variabel-variabel tersebut. Subjek penelitian terdiri dari 91 peserta yang merupakan calon guru dari kelompok keenam di Kabupaten Wonosobo. Teknik analisis data meliputi uji asumsi klasik, analisis jalur dengan teknik trimming, dan uji Sobel untuk menguji efek mediasi. Hasil menunjukkan bahwa kepemimpinan kepala sekolah tidak secara langsung mempengaruhi kinerja guru, tetapi secara langsung dipengaruhi oleh budaya sekolah. Efektivitas guru merupakan hasil dari pengaruh gabungan antara budaya sekolah dan kepemimpinan kepala sekolah. Selain itu, budaya sekolah, kepemimpinan kepala sekolah, dan kinerja guru berkontribusi dalam pembentukan karakter sekolah. Kinerja guru berperan sebagai mediator langsung antara kepemimpinan kepala sekolah dan karakter sekolah, serta mediator tambahan antara budaya sekolah dan karakter sekolah. Kesimpulan penelitian ini menekankan pentingnya memperkuat budaya sekolah dan peran kinerja guru dalam meningkatkan kualitas karakter sekolah.

Kata kunci: *Kepemimpinan, Budaya Sekolah, Kualitas Sekolah, Kinerja Guru*.

INTRODUCTION

Quality improvement in education is a strategic priority in the development of quality human resources. As global participation in education increases, the focus of policy has shifted from expanding access to improving school quality (Dorrío et al., 2024; Odondi, 2024; Tareke et al., 2024). In Indonesian, despite the implementation of various policies such as the Indonesia Pintar (Smart Indonesia) Program, teacher certifications, and the Merdeka Curriculum, the quality of education still faces real challenges, especially in underdeveloped areas such as Wonosobo Regency (KEMDIKBUDRISTEK, 2022).

School quality is affected by many factors, but school leadership, school culture, and teachers' performance are three key variables that are often directly linked to the quality of learning and student learning outcomes (Mahmood et al., 2024; Parveen et al., 2024). In this context， teachers are not only implementers of the curriculum (Erlina et al., 2024)， but also as agents of changes who determine the direction and atmosphere of student learning (Rushton et al., 2025). School leaders, on the other hand, play an important role in creating a conducive learning ecosystem through transformational and cultural leadership (Ersozlu et al., 2024).

Despite improvements in Indonesia's global rankings, the 2022 PISA results indicate that student learning outcomes remain generally low, with many students failing to meet the minimum competency level (KEMDIKBUDRISTEK, 2022). In Wonosobo Regency, the Average Years of Schooling (AYS) and Expected Years of Schooling (EYS) remain below the provincial average, reflecting challenges related to both access to education and its quality. Additionally, disparities in teacher quality, particularly after certification, and the suboptimal implementation of school culture exacerbate educational quality issues (Mu'afi & Sugiri, 2025; Sinthia et al., 2024).

Several studies highlight that a strong school culture can be an important catalyst in improving the quality of education, especially when supported by collaborative and inspiring school leadership (Aggrey et al., 2022; Nadeem, 2024). However, previous research has been limited to partial studies that separate the influence of school culture and principal leadership on quality, without explaining their interaction through teaching performance as a mediator. Recent meta-analyses call for the integration of principal leadership and teacher leadership within a unified school leadership framework (Sun et al., 2024).

While previous studies have examined the roles of school culture and principal leadership independently, they have not sufficiently integrated these factors within a single mediational framework that includes teacher performance. This study seeks to fill this gap by analysing the direct and indirect effects of principal leadership and school culture on school quality, with teacher performance acting as a mediating variable. This approach is expected to provide deeper insights into the interactions between leadership, culture, and performance, and offer practical recommendations for policymakers working to improve educational outcomes.

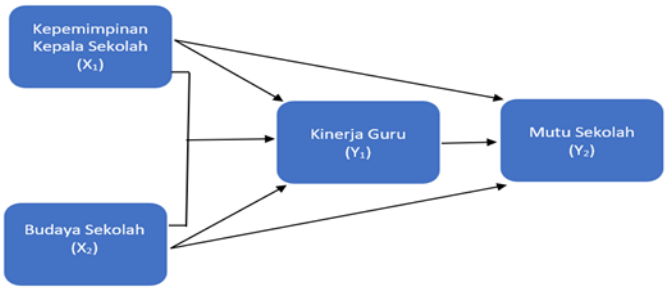
This study extends leadership theory by combining situational leadership and organizational culture perspectives to explain the formation of school quality. By integrating these theoretical frameworks, the study provides a more comprehensive understanding of how leadership and culture interact to shape educational environments and enhance school performance.

METHODS

This study employs a quantitative approach with path analysis to examine the direct and indirect effects between the variables of principal leadership (X1), school culture (X2), and school quality (Y2) through teacher performance (Y1)

as a mediator. This method was chosen because it can identify and measure causal relationships between variables in complex structural models, as well as enable statistical analysis of mediation paths (Xu et al., 2024).

Figure 1. Hypothesis model of research variables



This type of research falls under the category of explanatory research with a non-experimental causal design, as it aims to explain the relationship between variables as they are without treatment or manipulation of the subjects. The research was conducted in Wonosobo Regency, Central Java Province, with a population consisting of prospective Teacher Leaders Batch 6. The sample was taken using total sampling because the population size was relatively small and could be fully reached, namely 91 people.

Table 1. Research Population

No	Instance	Number of School	Number of Teacher Leaders
1	TK	4	4
2	SD	49	50
3	SMP	22	34
4	SMA	10	19
5	SMK	11	19
	Jumlah	**96**	**126**

Table 2. Research Sample Distribution

No	Instance	Number of School	Number of Teacher Leaders	Number of Sample
1	TK	4	4	3
2	SD	41	42	35
3	SMP	18	30	25
4	SMA	8	17	14
5	SMK	9	16	14
	Jumlah	80	109	91

Data were collected through a structured questionnaire administered in person during professional development sessions in Wonosobo Regency. The questionnaire, which included a 5-point Likert scale (strongly disagree to strongly agree), was designed based on the theoretical indicators for each variable. To ensure the validity and reliability of the instrument, content validity was tested through expert judgment, while construct validity and internal reliability were assessed using Corrected Item-Total Correlation and Cronbach's Alpha values, with a minimum threshold of 0.7 for acceptable reliability (Sugiyono, 2022).

This study was conducted in compliance with ethical research standards. Prior to data collection, permission was obtained from the local education authority, and informed consent was secured from all participants. Participants were informed of the study's objectives, their voluntary involvement, and the confidentiality of their responses.

Data analysis was conducted in stages. First, classical assumption tests (normality, multicollinearity, and heteroskedasticity) were conducted to ensure the data met the requirements for path analysis. Second, path analysis was used to determine the direct and indirect effects of each variable. Third, the Sobel test was employed to test the significance of the mediating effect of teacher performance in the relationship between principal leadership and school culture on school quality. The Sobel test was conducted using the formula

developed by (Birant et al., 2024) and calculated using statistical software such as SPSS or AMOS.

In the case of modifications to the use of path analysis, adjustments were made to the model structure based on the results of the initial model test. The initial model was then trimmed according to the contribution of insignificant path coefficients, which is a standard procedure in path analysis to improve model accuracy (Bahadur et al., 2024).

FINDINGS AND DISCUSSION

FINDINGS

The study involved 91 teachers in Wonosobo Regency. It used Pearson Product Moment correlation coefficients to determine the influence of school leadership and school culture on teacher quality and school quality. In addition, path analysis and hypothesis testing were conducted to evaluate the simultaneous contribution of these two variables to the dependent variables under study. Substructure I evaluates the influence of principal leadership (X1) and school culture (X2) on teacher performance (Y1), while substructure II assesses school quality (Y2).

Figure 2. Substructural Path Analysis Model I

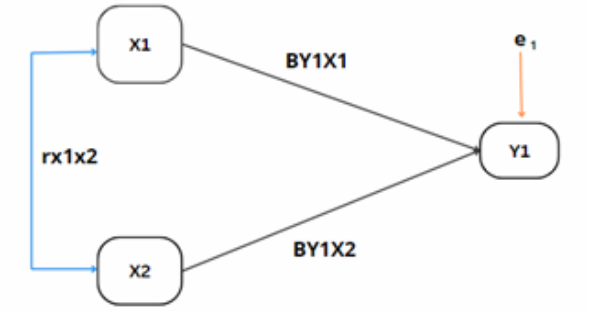


Figure 3. Substructural Path Analysis Model I

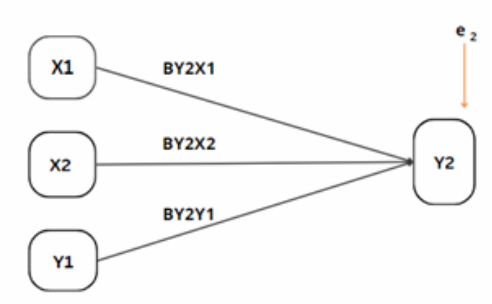
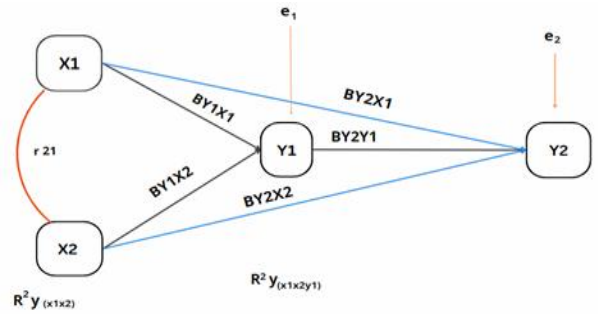


Figure 4. Full Path Analysis Model



Partial Correlation Coefficient Analysis

Substructural Path I.

School leadership (X1) and school culture (X2) are independent factors, while teacher performance (Y1) is dependent. The calculations show a substantial one-way correlation coefficient of 0.802 between variables X1 and X2. The one-way correlation coefficient of 0.536 between X1 and Y1 is strong. The correlation coefficient of 0.693 between X2 and Y1 indicates a strong unidirectional relationship.

Table 3. Partial Correlation Coefficient Calculation Results Sub-Structural Path I

	School Leadership	School Culture	TEACHERS' PERFORMANCE
School Leadership	Pearson Correlation: 1Sig. (2-tailed): —Sum of Squares and Cross-products: 16389.921Covariance: 182.110N: 91	Pearson Correlation: .802**Sig. (2-tailed): .000Sum of Squares and Cross-products: 17666.152Covariance: 196.291N: 91	Pearson Correlation: .536**Sig. (2-tailed): .000Sum of Squares and Cross-products: 5778.355Covariance: 64.204N: 91

School Culture	Pearson Correlation: .802**Sig. (2-tailed): .000Sum of Squares and Cross-products: 17666.152Covariance: 196.291N: 91	Pearson Correlation: 1Sig. (2-tailed): —Sum of Squares and Cross-products: 29639.846Covariance: 329.332N: 91	Pearson Correlation: .693**Sig. (2-tailed): .000Sum of Squares and Cross-products: 10035.077Covariance: 111.501N: 91
TEACHERS' PERFORMANCE	Pearson Correlation: .536**Sig. (2-tailed): .000Sum of Squares and Cross-products: 5778.355Covariance: 64.204N: 91	Pearson Correlation: .693**Sig. (2-tailed): .000Sum of Squares and Cross-products: 10035.077Covariance: 111.501N: 91	Pearson Correlation: 1Sig. (2-tailed): —Sum of Squares and Cross-products: 7079.033Covariance: 78.656N: 91

Substructural Path II

School leadership (X1) and school culture (X2) are independent factors in this study. Teacher success (X1) is an intervening or influencing variable. School quality (Y2) is the dependent variable. There is a strong one-way association value of 0.802 between factors X1 and X2 according to the calculations. There is a strong one-way relationship between X1 and Y1. The value is 0.536. With a value of 0.317, X1 and Y2 have a strong one-way relationship. The correlation of 0.693 between X2 and Y1 indicates a significant one-way relationship. A correlation of 0.639 between X2 and Y2 indicates a significant one-way relationship. Y1 and Y2 have a correlation of 0.660, indicating a strong one-way relationship. Indirect relationships occur between all research parameters.

Table 4. Partial Correlation Coefficient Calculation Results Sub-Structural Path II

	School Leadership	**School Culture**	**TEACHERS' PERFORMANCE**	**SCHOOL QUALITY**
School Leadership	Pearson Correlation: 1Sig. (2-tailed): —N: 91	Pearson Correlation: .802**Sig. (2-tailed): .000N: 91	Pearson Correlation: .536**Sig. (2-tailed): .000N: 91	Pearson Correlation: .317**Sig. (2-tailed): .002N: 91
School Culture	Pearson Correlation: .802**Sig. (2-	Pearson Correlation: 1Sig. (2-	Pearson Correlation: .693**Sig. (2-tailed): .000N: 91	Pearson Correlation: .639**Sig.

	tailed): .000N: 91	tailed): —N: 91		(2-tailed): .000N: 91
TEACHERS' PERFORMANCE	Pearson Correlation: .536**Sig. (2-tailed): .000N: 91	Pearson Correlation: .693**Sig. (2-tailed): .000N: 91	Pearson Correlation: 1Sig. (2-tailed): —N: 91	Pearson Correlation: .660**Sig. (2-tailed): .000N: 91
SCHOOL QUALITY	Pearson Correlation: .317**Sig. (2-tailed): .002N: 91	Pearson Correlation: .639**Sig. (2-tailed): .000N: 91	Pearson Correlation: .660**Sig. (2-tailed): .000N: 91	Pearson Correlation: 1Sig. (2-tailed): —N: 91

Simultaneous Correlation Coefficient Analysis

Substructural Path I.

To find the correlation coefficient, three factors were correlated: teacher performance, school culture, and principal leadership. The findings of the simultaneous correlation coefficient calculation are as follows:

Table 5. Simultaneous Correlation Coefficient of Teacher Performance Dependent Variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df 1	df 2	Sig. F Change	Durbin-Watson
1	.693[a]	.481	.469	6.462	.481	40.768	2	88	.000	2.275

Table 6. Guidelines for Interpreting Correlation Coefficients

Coefficient Interval	Relation Level
0,00 – 0,199	Very Low
0,20 – 0,399	Low
0,40 – 0,599	Moderate
0,60 – 0,799	Strong
0,80 – 1,000	Very Strong

Source: (Sugiyono, 2022)

Substructural Path II.

The simultaneous correlation coefficient is generated by the interconnection between school principal leadership, school culture, teacher performance, and school quality. The results of the simultaneous correlation coefficient calculation are as follows.

Table 7. Simultaneous Correlation Coefficient of School Quality Dependent Variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df 1	df 2	Sig. F Change	Durbin-Watson
1	.773[a]	.597	.583	8.255	.597	42.984	3	87	.000	2.073

Path Analysis Testing

Path Analysis Model

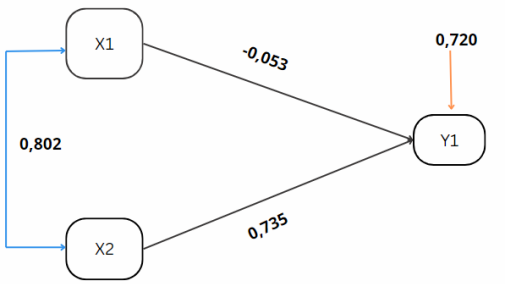


Fig. 5. Substructural Path Analysis Model I Before Trimming

Sub-structural path after trimming

Determination (R2)

The coefficient of determination for substructural route 1 after pruning does not include the main leadership variable (X1) because its effect on teacher performance (Y1) is moderate. Table 8 shows the results of the X1 pruning calculation.

Table 7. Substructural Path Determination Coefficient I After Trimming

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.693[a]	.480	.474	6.432	2.265

F-Test

Table 8. Results of the F-test calculation of variable X2 against Y1

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3397.547	1	3397.547	82.136	.000[b]
Residual	3681.486	89	41.365		
Total	7079.033	90			

T-Test

Table 9. Results of the t-test calculation of variable X2 against Y1

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics
	B	Std. Error	Beta			Tolerance
1 (Constant)	20.919	7.173		2.916	.004	
School Culture	.339	.037	.693	9.063	.000	1.000

Sub-structural I Equation After Trimming

$$Y1 = PY1X2 + e1 \quad \ldots\ldots (1)$$

$$Y1 = 0{,}693 + 0{,}721 \quad \ldots\ldots (1)$$

The structural path analysis model, after pruning, can be shown as follows:

Figure. 6. Substructural Path Analysis Model After Trimming

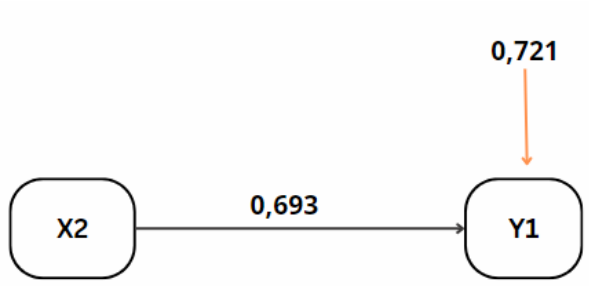


Fig. 7. Full Model Analysis of Alternative Routes

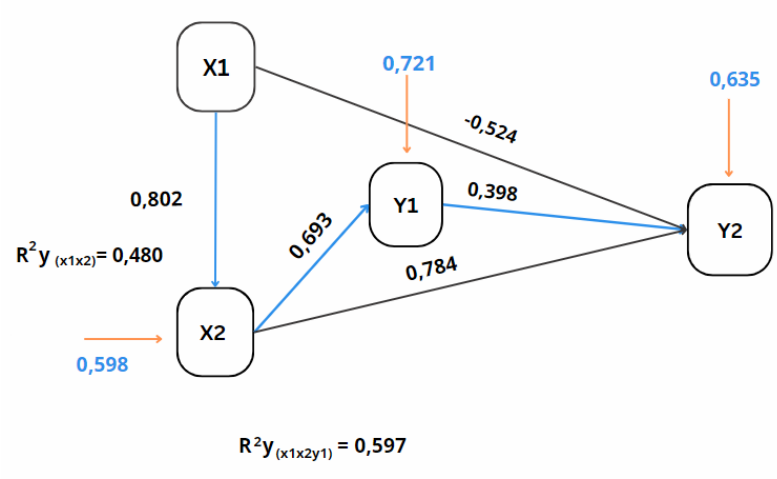


Table 10. Substructural Path I After Trimming (X2 to Y1)

Variable	Beta coefficient	Direct Influence	Indirect Influence	Total Indirect Impact	Total Influence
X2	0,693	0,480		0,000	0,480

Table 11. Substructural Path II (X1, X2, and Y1 relative to Y2)

Variable	Beta Coefficient	Direct Influence	Indirect Influence	Total Indirect Impact	Total Influence
X1	-0,524	0,275	X2: -0,329; Y1: -0,112	-0,441	-0,275
X2	0,784	0,615	X1: -0,329; Y1: 0,216	-0,113	0,501
Y1	0,398	0,158	X1: -0,112; X2: 0,216	0,104	0,263

Total Impact is the result of Direct Impact + Total Indirect Impact. The total overall impact is recorded as 0.598.

Table 12. Alternative Route (X1 to X2)

Variable	Beta Coefficient	Direct Influence	Indirect Influence	Total Indirect Impact	Total Influence
X1	0,802	0,643	-	0,000	0,643

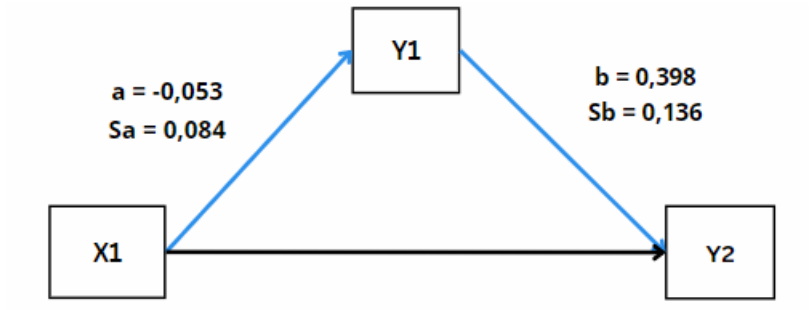
Total Impact is the sum of Direct Impact and Indirect Impact (since Indirect = 0, it is equal to Direct).

Sobel-Test

The Sobel test ensures that variable X indirectly influences Y through M in the intervening analysis. The Sobel test calculates the indirect influence of X on Y through M, as stated by Ghozali (2018:244). This study uses the Sobel test to determine the indirect effect of X on Y through M. The formula for the indirect effect of X on Y through M:

The coefficient and standard error of school principal leadership (X1) describe its mediating effect on teacher performance (Y1) and school quality (Y2):

Figure. 8. Illustration of Sobel Test Calculation for Variable X1



DISCUSSION

This study examines the influence of school principal leadership and school culture on teacher performance and school quality in Wonosobo

Regency, Central Java, and uses route analysis to find the best way to improve school quality. Based on the results of hypothesis testing, various conclusions are explored thoroughly with a supporting theoretical framework in relation to the actual field settings.

The Partial Contribution of School Principal Leadership to Teacher Performance in Wonosobo Regency, Central Java

The principal leadership variable (X1) has a t-coefficient of -0.410 and a significance value of 0.683 above 0.05 because of partial analysis using the t-test. Thus, Y1 is not influenced by X1. Therefore, teacher performance in Wonosobo Regency is not influenced by principal leadership, because accepting Ho1 means rejecting Ha1. Hypothesis 8 states that teacher performance is not the primary mediator between school leadership and school quality. Teacher performance is a direct variable if no mediation occurs.

This study contradicts previous findings that school leadership in Wonosobo District, Central Java, does not influence teacher performance. Environmental and school factors may alter study outcomes. This study is based on situational and empowerment theory, which emphasizes the importance of context in understanding leadership impact. The resolution lies in alternative path analysis, where leadership may influence teacher performance through school culture. The Sobel test findings indicate that school culture functions as a significant mediating component. Using a comprehensive alternative path analysis model, the total data diversity explained by Figure 11 is determined, showing that the alternative path model accounts for 92.50% of school quality, while the remaining 7.50% is associated with unaccounted variables and errors.

The school culture variable (X2) has a positive coefficient on Y1 with a t-value of 5.723, which is greater than the critical t-value of 1.988 and a significance level of 0.00, which is less than 0.05. It can be confirmed that Y1 is significantly influenced by X2. The research results

indicate that school culture in Wonosobo Regency influences teacher performance by 0.480 or 48%. School culture enhances teacher performance. The quality of learning depends on school culture (Alzoraiki et al., 2024; Amirudin et al., 2024; Mardiyah et al., 2024; Ruhiyat et al., 2024). Not only high-performing teachers, well-maintained facilities, and engaged students are important, but also the strong influence of teachers and school administration. Academic performance is highly dependent on the school environment.

The Simultaneous Contribution of School Principal Leadership and School Culture to Teacher Performance in Wonosobo Regency, Central Java

The final hypothesis of this study is that school leadership and school culture in Wonosobo Regency influence teacher supervision by 0.309 or 30.9%. School leadership and school culture influence teacher performance (Liu et al., 2021; Maheshwari, 2022; Mincu, 2022). A competent administrator will establish a clear vision and measurable goals for the school. This provides clear guidance for educators to improve the quality of learning. A good and inclusive school culture can encourage teacher involvement in school activities and decision-making, thereby increasing their motivation and performance. A supportive school environment can provide emotional and social support to educators, along with recognition and appreciation for their achievements.

A supportive school culture and strong administrators contribute to a work environment that enhances teacher performance and growth. Higher teacher performance drives student learning and development, which strengthens support and trust in the principal and school culture.

The Partial Contribution of School Principals' Leadership to School Quality in Wonosobo Regency, Central Java

According to the fourth hypothesis, the leadership of school principals in Wonosobo Regency reduces school quality by -0.275 or

27.5%. This indicates that the leadership of school principals in Wonosobo Regency must be improved when school quality declines. School leadership influences school quality, which supports this study (Bellibaş et al., 2021; Fotheringham et al., 2022). School principals shape the direction, vision, and policies of schools. The leadership style, talent, and decisions of school principals influence school culture, staff motivation, and the quality of education. Good administrators improve the quality of education by inspiring and guiding staff and students to meet higher standards.

The Partial Contribution of Performance Teacher Leadership to School Quality in Wonosobo Regency, Central Java

The sixth hypothesis test from the research data shows a direct and substantial relationship between teacher effectiveness and factors that influence school quality. School quality is influenced by teacher performance by 0.158, or 15.8%. Teacher performance substantially influences school quality in Wonosobo Regency. Improving teacher performance will correlate with improving school quality in Wonosobo Regency. Teacher performance somewhat influences school quality, supporting this study(Wrigley-Asante et al., 2023).

Educator efficacy has a significant impact on the quality of educational institutions. Educators are a fundamental component of the educational process, and the quality of their performance directly influences learning, achievement, and the overall effectiveness of the institution. Educator effectiveness directly influences the quality of teaching in the classroom. Inspirational educators in Wonosobo Regency effectively articulate content, encourage substantive debate, and design learning methodologies tailored to student needs. Exemplary teaching promotes a positive educational experience for students and improves learning outcomes.

The Simultaneous Contribution of School Principal Leadership and School Culture to School Quality through Teacher Performance in Wonosobo Regency, Central Java

This study shows that teachers influence school quality. The seventh hypothesis of the study conducted in Wonosobo Regency, Central Java, found that school quality is improved by teacher performance, school culture, and administrative leadership. School quality is influenced by teacher effectiveness, school culture, and principal leadership by 79.10%. The alternative path model, which correlates principal leadership and teacher performance through school culture, is 95% original and 75% error and other variables. Teacher performance and school quality will improve with good principal leadership and a supportive school environment (Zaini et al., 2023). The improvement of school quality in Wonosobo Regency depends on school culture and guidance counsellors, but if school quality declines, principal leadership must be improved.

According to the Sobel test, the relationship between principal leadership and school quality is not moderated by teacher performance, as the t-estimate value of -0.5195526 is smaller than the essential t-value of 1.96 at a 5% significance margin. We reject our initial hypothesis because it does not show a meaningful impact.

In the Sobel test, school culture (X2) influences school quality (Y2) through teacher performance (Y1) as a mediating variable. The Sobel statistic is 0.060 and the t-value is 2.82040944. Teacher performance mediates the relationship between school culture and quality, as the mediation coefficient of 0.060 is statistically significant. The alternative path Sobel test shows that school leadership (X1) influences teacher performance (Y1) through school culture (X2), as evidenced by the Sobel statistic of 0.124 and the t-value of 4.46416. School culture is associated with teacher performance and principal leadership, as evidenced by the statistically significant mediation value of 0.124. The seventh premise of this study, which asserts that principal leadership influences teacher

performance by influencing school culture, has been verified. Teacher performance is indirectly influenced by school culture.

CONCLUSION

This study offers valuable insights into the interplay between school leadership, school culture, and teacher performance in shaping school quality in Wonosobo Regency, Central Java. The findings highlight the importance of school culture as a mediator between principal leadership and teacher performance, suggesting that leadership alone does not directly influence teacher outcomes. Instead, school culture plays a critical role in enhancing teacher performance, which in turn contributes to improved school quality. These results underscore the need for school leaders to cultivate a positive and supportive culture within their schools to maximize the effectiveness of their leadership. Theoretically, this study enriches the understanding of the leadership–culture interaction in school improvement by integrating situational leadership and organizational culture perspectives, emphasizing the indirect role of principal leadership in contexts where teachers have high autonomy or established practices.

Practically, the study suggests that strengthening teacher development programs should be prioritized as a pathway to enhancing school quality, as teacher performance serves as a key mediator between leadership, school culture, and school quality. Investing in continuous professional development and fostering a collaborative school culture can therefore significantly improve educational outcomes, particularly when aligned with local contextual conditions. Additionally, policymakers and school leaders should consider the specific characteristics of rural and underdeveloped areas to create supportive environments that enable both teachers and leaders to thrive. Despite its contributions, this study is limited by its cross-sectional design and focus on a single region, which restricts generalizability. Future research is encouraged to employ longitudinal designs and include more diverse regional contexts to examine how external factors such as resources and local governance influence the relationship between leadership, school culture, and school quality.

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