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The Effect Of Principal Supervision And Technology Use On The Performance Of Junior High School Teachers With School Culture As Mediation

Nirmaliani[1]
Open University, Batam, Indonesia
Sufyati HS[2]
Veteran National Development University, Jakarta, Indonesia
Endi Rekarti[3]
Open University, South Tangerang, Banten, Indonesia

Corresponding Author: *sufyati@upnvj.ac.id*

Abstract

Through the learning process in schools, education plays a crucial and strategic role in creating quality human resources. This study aims to analyze the influence of the implementation of principal supervision and the use of technology on the performance of junior high school teachers in East Tanjungpinang District with school culture as a mediating variable. This study employs an ex-post facto quantitative methodology. Likert scale questionnaires were used to gather research data. 118 junior high school teachers from the East Tanjungpinang District made up the research sample. The Sobel test was employed to determine the significance of the mediation effect, and multiple linear regression analysis and path analysis were employed to examine the direct and indirect influence of factors. The findings demonstrated that principal supervision had an indirect impact on school culture rather than a direct one on teacher performance. The results of the Sobel test showed a Z value of 4.55 (>1.96) which means that school culture strongly and significantly mediates the relationship between the implementation of principal supervision and teacher performance. The use of technology was also proven to have a positive effect on school culture and teacher performance, and showed a significant indirect effect through school culture with a Z value of 4.16 (>1.96). This finding confirms that school culture is able to mediate the influence of the implementation of principal supervision and the use of technology on teacher performance.

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Keywords: Junior High School Teacher Performance; Principal Supervision; Technology; School Culture; Mediation

INTRODUCTION

Through the learning process in schools, education plays a crucial and strategic role in creating quality human resources. In this context, teachers are crucial educators who shape students' personalities and skills, while also acting as instructors. To create an efficient and high-quality learning process that ultimately leads to the achievement of national education goals, teachers must perform at their best (Supardi, 2014). Teacher performance reflects the level of success of teachers in carrying out the tasks and responsibilities assigned by the school to support the achievement of the vision, mission, and educational goals in accordance with established legal provisions, moral norms, and professional ethics (Joem Siemze, Purnawati, 2022). The lack of teacher welfare, the decline in the number of teachers, and the low average score of the Teacher Competency Test (UKG) in Indonesia, which is still far below standard, particularly in the Riau Islands Province, where the score only reached 56.79%, all demonstrate that efforts to improve the quality of education still face significant challenges (AD Setiawan & Widayatsih, 2024) . This demonstrates the urgent need for deliberate steps to improve teacher effectiveness.

Teacher performance reflects their professional skills in carrying out their primary responsibilities, which include establishing educational administration and planning, implementing, and assessing learning. Law number 14 of 2005 concerning Teachers and Lecturers discusses the importance of mastering four fundamental competencies: pedagogical, personality, professional, and social, clearly laying the legal foundation for this. A positive school culture that encourages the development of a dynamic, collaborative, and supportive work environment for personal growth (Mabruroh et al., 2020); the use of technology that can produce more creative, innovative, and non-monotonous learning (Abdul, 2018); and academic supervision by the principal, which is useful in guiding and developing teacher professionalism, are some of the determining factors for improving teacher performance. These three factors work together to create an ecosystem that encourages improving the standards of the educational process.

Principal supervision is an effort carried out by the principal to encourage and guide teachers so that teaching and learning activities can take place more effectively (Kristiningsih, N., 2022). Educational supervision functions as a activator of change in educational elements (Prasiska & Jarkawi, 2021). AECT defines educational technology as research and practice to improve performance and facilitate learning through the creation, implementation, and

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administration of appropriate learning procedures and materials (Mundir, 2022). Communication tools such as telephones, computers, the internet, email, and others are used to integrate technology as an educational medium (Hidayah et al., 2022). In addition, school culture is a state of school life where students and teachers interact with each other, counselors interact with students, all members of the educational staff interact with each other, and interactions occur between educators, students, and members of the school community (Kusumasari et al., 2023). In accordance with the role of school culture, namely optimizing teacher performance and improving school quality (Binjei, 2021). A strong school culture can shape teacher commitment, motivation, and work behavior, which in turn impacts the overall effectiveness of school performance (Deal & Peterson, 2016). It is crucial to understand how technology use and principal supervision influence teacher performance, with school culture acting as a mediating variable, to improve educational quality. The impact of technology use on teacher effectiveness and principal supervision can be mediated by school culture (Nogadas & Apostol, 2024).

Junior high schools in East Tanjungpinang District consistently maintain and improve the quality of education. One of the efforts implemented is the principal's supervisory role in strategies to improve the quality of teaching staff (Glickman et al., 2018). Classroom supervision or observation, routine learning evaluations, workshops, and the integration of school cultural values are routine agendas. However, the effectiveness 2of supervision and the use of technology through school culture still needs to be reviewed in depth, especially in improving teacher performance. This research is important to see how the direct and indirect effects after including mediating variables. Therefore, the results of this study are expected to provide input for strengthening the education management system in schools.

METHOD

This study used an ex-post facto quantitative approach, where researchers examined the correlation between variables based on historical events without any manipulation (Sugiyono, 2020). The study population consisted of 168 public junior high school teachers in East Tanjungpinang District. The sampling technique used was proportional random sampling. A 5% margin of error and the Slovin formula were used to select 118 respondents proportionally from each of the five schools. A questionnaire that had been tested for validity and reliability was used as a research tool. The Sobel test, path analysis, and multiple linear regression analysis were applied during the data analysis process using SPSS. The research variables were the independent variables: Principal Supervision Implementation (X1) and Technology Use (X2), the mediating

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variable was school culture (Z) and the dependent variable was Teacher Performance (Y).

RESULTS AND DISCUSSION

RESULTS

Table 1. Results of the regression analysis of path I model

Coefficients [a]							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	-1.51E-16	.044		.000	1,000		
Principal Supervision	-.003	.074	-.003	-.036	.971	.360	2,781
Use of Technology	.465	.070	.465	6,690	.000	.412	2,425
School Culture	.474	.085	.474	5,565	.000	.275	3,637
a. Dependent Variable: Teacher Performance							

Based on the regression analysis results in Table 1, the principal supervision variable has a regression coefficient of -0.003 with a significance of 0.971. This indicates that there is no positive and significant influence on teacher performance. Furthermore, the technology use variable has a regression coefficient of 0.465 and a significance of 0.000, indicating a positive and significant influence on teacher performance. Meanwhile, the school culture variable has a regression coefficient of 0.474 and a significance of 0.000, indicating a positive and significant influence on teacher performance. The next step for deeper interpretation is to analyze the R^2 results table to determine the magnitude of the influence produced by each variable.

Table 2. R^2 Results

Model Summary				
Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.879 [a]	.773	.767	.48319712
a. Predictors: (Constant), School Culture, Use of Technology, Principal Supervision				

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Table 2 shows that the regression model performed well in explaining the influence of principal supervision, technology use, and school culture on teacher performance. The R^2 value of 77.3 % indicates that all three variables simultaneously contribute to teacher performance. The results of the regression analysis of the second path model are as follows:

Table 3. Results of the regression analysis of path II model

Coefficients [a]							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	4.32E-17	0.49		.000	1,000		
Principal Supervision	.518	.066	.518	7,890	.000	.554	1,804
Use of Technology	.413	.066	.413	6,290	.000	.554	1,804
a. Dependent Variable: School Culture							

Based on the regression analysis results in Table 3, the principal supervision variable has a regression coefficient of 0.518 and a significance of 0.000. This indicates a positive and significant influence on school culture. Furthermore, the technology use variable has a regression coefficient of 0.413 and a significance of 0.000, indicating a positive and significant influence on school culture. Further interpretation is carried out by analyzing the R^2 table to determine the magnitude of the influence of each variable.

Table 4. R^2 Results

Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.851 [a]	.725	.720	.52891191

a. Predictors: (Constant), Use of Technology, Principal Supervision

Table 4 shows that the regression model adequately explains the influence of principal supervision and technology use on school culture. The R2 value of 72.5 % indicates that both variables contribute to school culture. The hypothesis test is presented in Figure 1 below:

$\epsilon_1 = 0{,}227$

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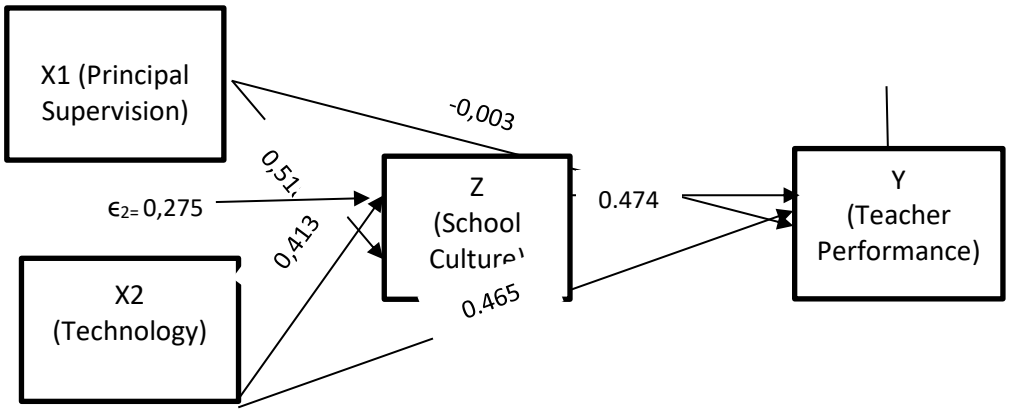


Figure 1. Hypothesis Test Results
Source: Data processed by researchers

Table 5. Interpretation of Hypothesis Test Values

No	Hypothesis	Regression Coefficient	Conclusion
1.	There is no positive and significant influence of the implementation of principal supervision on the performance of junior high school teachers in East Tanjungpinang sub-district.	Path Coefficient = -0.003 p-value = 0.971	Not accepted
2.	There is a positive and significant influence of the use of technology on the performance of junior high school teachers in East Tanjungpinang sub-district.	Path Coefficient = 0.465 p-value = 0.000	Accepted
3.	There is a positive and significant influence of school culture on the performance of junior high school teachers in East Tanjungpinang sub-district.	Path Coefficient = 0.474 p-value = 0.000	Accepted
4.	There is a positive and significant influence of the implementation of principal supervision on the school culture of junior high schools in East Tanjungpinang sub-	Path Coefficient = 0.518 p-value = 0.000	Accepted

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	district.		
5.	There is a positive and significant influence of the use of technology on the school culture of junior high schools in East Tanjungpinang district.	Path Coefficient = 0.413 p-value = 0.000	Accepted
6.	There is a positive and significant influence of the implementation of principal supervision on teacher performance with school culture as a mediating variable in junior high schools in East Tanjungpinang sub-district.	Z = 4.55 p-value = 0.000	Accepted
7.	There is a positive and significant influence of the use of technology on teacher performance with school culture as a mediating variable in junior high schools in East Tanjungpinang sub-district.	Z = 4.16 p-value = 0.000	Accepted

The results of testing the hypothesis proposed in this study provide an overview of the relationship between the implementation of principal supervision, the use of technology, school culture and teacher performance in public junior high schools in East Tanjungpinang District.

The hypothesis that principal supervision has a positive and significant effect on teacher performance was rejected, with a path coefficient of -0.003 and a p-value >0.005. This indicates that principal supervision has not been able to improve teacher performance.

The hypothesis that technology use has a positive and significant effect on teacher performance was accepted, with a path coefficient of 0.465 and a p-value <0.005. This means that better technology utilization in both the learning and administrative processes will improve teacher performance.

The hypothesis that school culture has a positive and significant influence on teacher performance is accepted, the path coefficient is 0.474 and the p-value <0.005, stating that the stronger the values, norms and positive habits in the school, the more teacher performance will improve.

The hypothesis that the implementation of principal supervision has a positive and significant effect on school culture was accepted, with a path coefficient of 0.518 and a p-value

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<0.005. This indicates that the better the implementation of principal supervision, the stronger the school culture that is formed.

The hypothesis that technology use has a positive and significant impact on school culture is accepted, with a path coefficient of 0.413 with a p-value <0.005. This means that the better the use of technology in the learning process and school management, the stronger the school culture will be.

The hypothesis that the implementation of principal supervision has a positive and significant effect on teacher performance with school culture as a mediating variable is declared accepted, with the results of the Sobel calculator calculation being 4.55 and a p-value of 0.000. This means that there is an indirect influence between the implementation of principal supervision on teacher performance and school culture as a mediating variable.

The hypothesis stating that technology use has a positive and significant effect on teacher performance with school culture as a mediating variable is declared accepted, with the results of the Sobel calculator calculation of 4.16 and a p-value of 0.000. This shows that there is an indirect influence between technology use on teacher performance and school culture as a mediating variable.

DISCUSSION

The results of this study indicate that the implementation of principal supervision has an insignificant effect on teacher performance in public junior high schools in East Tanjungpinang District, with a regression coefficient value of -0.003. This indicates that if the implementation of supervision is carried out by the principal, it is not able to improve teacher performance. The purpose of principal supervision is to improve teacher professionalism through coaching and learning evaluation (Sergiovanni & Starratt, 2007). However, this study found that the implementation of principal supervision alone is not sufficient to function as an effective professional development instrument. Similar research conducted (Nabila et al., 2026) showed that principal supervision did not have a significant impact on teacher performance in early childhood education, even though supervision was implemented well. The results of this study indicate that the existence of supervision alone is not enough to improve teacher performance if it is not accompanied by other supporting factors such as motivation and the work environment or culture in the school. Therefore, this research is not always direct, but can also be influenced by indirect variables.

The results of this study reveal the hypothesis that the use of technology has a positive

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and significant influence on teacher performance in public junior high schools in East Tanjungpinang District with a regression coefficient value of 0.465. This value indicates that increased use of technology by teachers has a direct impact on student achievement. This figure also shows that technology is now a crucial component in helping teachers prepare classes, implement learning, and assess learning objectives. The pedagogical aspect of education is greatly enhanced by the use of technology, where the use of technology leads to successful learning with the help and support of many elements and components of the technology itself (Ghavifekr & Rosdy, 2015). Educational technology also plays a role in facilitating easy access to learning information and contributing to the development of a quality learning system (Mundir, 2022). If the application of technology is carried out in accordance with the system and collaboration between parties, it will certainly achieve the desired goals. In line with research (Harahap, 2020) stating that teacher performance is positively and significantly influenced by the supervision of the principal and the ability to use technology simultaneously. In addition, 61.8% of the performance of SDIT Al-Bina Tomoni teachers was positively and significantly influenced by organizational culture and the use of ICT (Muktiningsih, 2022).

The results of this study reveal the hypothesis that school culture has a positive and significant influence on teacher performance in public junior high schools in East Tanjungpinang District with a regression coefficient of 0.474. This shows that school culture is a factor that can influence how well teachers perform. By emphasizing empathy, ethics, and communication for educators, students, and every aspect of the school, the implementation of school culture fosters positive energy in character development (Hada & Zumrotun, 2024) . The habit of continuously developing oneself by school residents to improve themselves and enhance the quality of their performance is part of a culture that grows as a positive tradition and is not seen as a work burden (Sophianingreki, 2020). Trust, values, norms, and unwritten rules that apply in the school environment are part of a good school culture. Teachers will feel more motivated to give their best when the school culture fosters a supportive, orderly, cooperative, and quality-focused work environment. Teacher performance in schools with relevant norms may be influenced by school culture (Azainil et al., 2020) . Strengthening a positive school culture will have a direct impact on improving the quality of teaching and contribute to the quality of education.

The results of this study reveal the hypothesis that the implementation of principal supervision on school culture has a positive and significant influence on teacher performance in public junior high schools in East Tanjungpinang District, with a regression coefficient of 0.518. This indicates that school culture will be strengthened if the principal's supervision is carried out

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better. In addition to providing administrative control, supervision is a professional development process that has the power to influence the norms, values, and work habits of school personnel. (Sergiovanni, 2009). Continuous and participatory supervision will create a positive school climate and form a strong school culture. This is in line with research by (Nurhayati et al., 2025), explains how the establishment of principal supervision plays a major role in shaping school culture. Good habits will be fostered within the school as a result of this culture, demonstrated by teachers working more collaboratively to implement, plan, and assess instruction to ensure that learning is moving in the right direction.

The results of this study reveal the hypothesis that the use of technology in school culture has a positive and significant influence on teacher performance in public junior high schools in East Tanjungpinang District with a regression coefficient of 0.413. This indicates that the higher the use of technology in schools, the more adaptive culture to change will increase. According to Alolilіweri in Setiawan, there is a circle of relationships between technology and culture that are interdependent, mutually influencing, and mutually producing (D. Setiawan, 2018). In other words, technological culture shapes human culture, and human culture shapes technology. In line with research from (Adler et al., 2025). Effective technology is not just a matter of technical skills but also how teachers develop culturally relevant teaching. Furthermore, research by Nugroho et al. (2022) states that technology integration encourages cultural change to become more adaptive, interactive, and oriented toward innovative learning. Mastery and utilization of technology fosters a positive culture within the school environment.

The results of this study reveal the hypothesis that the implementation of principal supervision on teacher performance in public junior high schools in East Tanjungpinang District, with school culture as a mediating variable, has a positive and significant influence with a regression coefficient of 0.518. This shows how principal supervision on teacher performance can be indirectly mediated by school culture. Positive values, norms, and work habits will be formed in the school environment when supervision is implemented in a planned, inclusive, and sustainable manner. Similarly, research by (Rafiqie et al., 2025) suggests that school culture can mediate clinical supervision in improving teachers' pedagogical competence. Furthermore, research by (Sumiati et al., 2024) states that collaborative school culture serves as an efficient mediating factor during the process and that adaptive leadership has a significant and beneficial impact on teacher performance. Research by (Prasetyo et al., 2023) also shows an indirect influence between school culture and academic supervision on teacher performance. Therefore, it can be concluded that the principal's supervision must be accompanied by positive work culture

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habits to improve teacher performance.

The results of this study reveal the hypothesis that the use of technology on teacher performance in public junior high schools in East Tanjungpinang District, with school culture as a mediating variable, has a positive and significant influence with a regression coefficient of 0.413. It can be concluded that there is an indirect influence of school culture in the use of technology on teacher performance. The better the use of technology, the stronger the school culture that is formed. Technological literacy consists of technical knowledge and pedagogical skills needed to balance the use of technology with learning objectives, support student engagement, and deepen understanding (Chaidir et al., 2025). In line with research from (Adler et al., 2025) that effective technology is not only a matter of technical skills but how teachers develop culturally relevant teaching and are supported by the school, both managerially and with adequate facilities. Then the results of research from (Rasdiana et al., 2024) state that digital literacy can mediate the influence of school culture on teacher performance and improve teacher performance. The design, implementation, and assessment of learning in schools by teachers reflect this. So that, the use of technology in the teaching and learning process and administration will fostering digital-based teaching patterns to create a culture of sustainable learning.

CONCLUSION

Based on the results of data processing and discussion, it can be concluded that the implementation of principal supervision does not have a positive and significant effect. Meanwhile, the use of technology and school culture have a positive and significant effect on teacher performance. In the indirect effect tested using the Sobel calculator, the results showed that school culture is able to mediate the implementation of principal supervision and the use of technology on teacher performance. The significance value of the implementation of principal supervision and school culture on teacher performance through school culture of 0.000 (Path I) and 0.000 (Path II) indicates that school culture mediates the effect. The conclusion of this study is that the implementation of principal supervision on teacher performance does not have a direct effect but has an indirect effect through school culture as a mediator, while the use of technology has a direct and indirect effect on teacher performance through school culture. This study can provide input for school principals in improving teacher performance through continuous improvement of the implementation of school culture-based supervision. Then, the need to improve teacher digital literacy, the availability of technological support facilities in schools and carry out positive cultural habits in improving teacher performance.

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SUGGESTION

Principal supervision and the use of technology, combined with a positive school culture, are some ways to improve teacher performance. Teacher performance can be enhanced through focused, organized, and frequent academic monitoring. These practices will foster a school culture that becomes a habit for teachers, contributing to improved performance. A disciplined and responsible work culture will achieve the desired goals. Innovation in the classroom is fostered by creating and designing innovative learning experiences utilizing technology, including digital teaching materials or multimedia-based learning media. Furthermore, this fosters a supportive, cooperative, and creative school culture, creating a conducive work environment for improving teacher effectiveness. It is hoped that future researchers will use this study as a reference for conducting similar studies or, if necessary, conducting additional research by incorporating additional independent variables to identify additional aspects that have a substantial impact on teacher performance.

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