

Primary School Teacher Professionalism: Analysis Based On Principal Managerial Competencies and Teacher Tpack In Rumbai District Pekanbaru City

Mely Jumika¹, Erni¹, Erlisnawati¹

¹ Educational Administration, University of Riau, Pekanbaru, Indonesia
mely.jumika8104@grad.unri.ac.id, erni.@lecturer.unri.ac.id, erlisnawati@lecturer.unri.ac.id
corresponding author: mely.jumika8104@grad.unri.ac.id

ABSTRACT

This study aims to analyze the influence of principals' managerial competence and teachers' Technological Pedagogical Content Knowledge (TPACK) on the professionalism of public elementary school teachers in Rumbai District, Pekanbaru City. This study uses a quantitative, ex post facto research design. The population was 360 teachers from 20 public elementary schools in Rumbai District. The research sample was determined using the Slovin formula and obtained 190 respondents with a proportional random sampling technique. The instrument trial was conducted on 30 teachers outside the research sample. The data collection technique used a distributed questionnaire. Data analysis used SPSS version 26, including descriptive and inferential statistical analyses, as well as classical assumption tests and hypothesis tests. The novelty of this study lies in testing the simultaneous influence of principals' managerial competence and teachers' TPACK on teacher professionalism at the elementary school level. The results showed that principals' managerial competence and TPACK had a positive and significant effect on teacher professionalism. In addition, principals' managerial competence and teachers' TPACK simultaneously had a positive and significant effect on teacher professionalism, contributing 42.5% in the moderate category. Research findings show that increasing teacher professionalism is influenced by the principal's ability to manage the school effectively and by teachers' ability to integrate technology, pedagogy, and content into the learning process.

Keywords: *principal managerial competence, teacher TPACK, teacher professionalism*

Submitted	Accepted	Published
20 May 2026	01 June 2026	30 July 2026

Citation	:	Jumika, M., Erni., & Erlisnawati. (2026). Primary School Teacher Professionalism: Analysis Based On Principal Managerial Competencies and Teacher Tpack In Rumbai District, Pekanbaru City. <i>Jurnal PAJAR (Pendidikan dan Pengajaran)</i> , 10(4), 634-644. DOI: http://dx.doi.org/10.33578/pjr.v10i4.1562 .
----------	---	--

INTRODUCTION

Education is a fundamental aspect in developing high-quality and competitive human resources. Through education, individuals are shaped to possess intellectual abilities, skills, and character that align with the demands of modern development. This aligns with Law Number 20 of 2003 concerning the National Education System, which affirms that education is a conscious and planned effort to develop students' potential to become individuals who are faithful, pious, possess noble character, are intelligent, creative, independent, and responsible. In the context of globalization and the Society 5.0 era, education plays a strategic role in preparing human resources to adapt to rapid, dynamic developments in science and technology.

The development of the Society 5.0 era demands that the education system transform its learning processes. 21st-century education is no longer solely focused on mastering knowledge but also on developing critical thinking, creativity, collaboration, communication, and digital literacy. Therefore, integrating technology into learning is an unavoidable necessity. (Wiwik & Murniyati, 2025) state that the use of technology in learning is necessary as a means of adapting to the demands of 21st-century learning. The appropriate use of technology can create a more engaging, interactive, and effective learning environment, thereby improving the quality of learning in elementary schools.

In efforts to improve the quality of education, teacher professionalism is a crucial factor in determining the success of the learning process. According to Law Number 14 of 2005 concerning Teachers

and Lecturers, teacher professionalism encompasses the continuous mastery of pedagogical, professional, social, and personality competencies. Professional teachers are required to design innovative learning, manage classes effectively, utilize learning technology, and adapt learning methods to student needs. Teachers hold a strategic position as key actors in the educational process, so the quality of education is greatly influenced by their level of professionalism (Nur & Mardiah, 2020; Suhardi, 2019).

However, the professionalism of elementary school teachers in Indonesia continues to face various challenges. Data from the Regional Education Balance Sheet (NPD) of Riau Province in 2024 shows that 67.1% of elementary school teachers are not certified, and the majority still have suboptimal competency levels. Furthermore, the 2019 Teacher Competency Test (UKG) results showed an average score of 52.77 for elementary school teachers in Riau, with pedagogical competency scores of 51 and professional competency scores of 57.01 (LPMP Riau, 2020). This data indicates that teacher competency, particularly in pedagogical and professional aspects, still needs improvement to meet the demands of 21st-century learning.

One crucial aspect of improving teacher professionalism is mastery of Technological, Pedagogical, and Content Knowledge (TPACK). TPACK is a teacher's ability to effectively integrate technology, pedagogy, and learning materials into the learning process. Mastery of TPACK is crucial because teachers are required not only to master subject matter and learning strategies but also to use technology as a learning support medium. (Rohmanurmeta et al., 2023) stated that the concept of TPACK is still not widely understood by elementary school teachers in Indonesia, even though this competency is crucial in facing current developments in educational technology. Teachers with strong TPACK competencies tend to be better able to create innovative, engaging, and relevant learning experiences that meet students' needs.

Low levels of TPACK mastery among teachers can impact the quality of learning in schools. (Wiguna et al., 2024) explain that failure to integrate technology, pedagogy, and learning content can lead to monotonous and uninteresting learning processes, thus reducing student motivation. Initial observations by researchers at several public elementary schools in Rumbai District indicate that some teachers still lack confidence in using interactive learning applications and prefer conventional lecture methods. Furthermore, some teachers still believe that mastery of learning materials and methods alone is sufficient, without considering the importance of integrating technology into learning. This situation indicates that elementary school teachers' TPACK skills still need improvement.

In addition to teacher TPACK competency, another factor influencing teacher professionalism is the principal's managerial competence. The principal plays a crucial role as an educational leader responsible for managing. The principal's managerial competence encompasses the ability to plan, organize, implement, and supervise various school programs. (Dahlan, 2016) explains that a principal's managerial competence is crucial for creating a conducive work environment, improving teacher discipline, and encouraging teacher professional development. A principal with strong managerial skills will be able to guide teachers in improving learning quality and adapting to developments in educational technology.

Although several studies have examined the relationship between principals' managerial competencies and teacher professionalism, as well as the influence of TPACK on learning quality, most studies continue to treat these variables separately. Research examining the influence of principals' managerial competencies and teachers' TPACK on elementary school teacher professionalism is still relatively limited, particularly in the context of public elementary schools in Rumbai District, Pekanbaru City. Furthermore, most previous studies have focused more on teacher performance, student learning outcomes, or learning effectiveness, thus not providing a comprehensive picture of the contribution of these two variables to teacher professionalism as a whole.

Based on initial observations at several public elementary schools in Rumbai District, it was found that principals' managerial competence still faces several obstacles, including difficulty aligning the school's vision and mission due to differences in teachers' perspectives and work habits. Furthermore, human resource management, particularly in supporting teacher competency development, remains suboptimal. Furthermore, teacher professionalism faces challenges, including a lack of relevant training and teachers' limited ability to

integrate technology into learning. These issues indicate that principals' managerial competence and teachers' TPACK (Comprehensive Assessment of Technology) are important factors that may influence elementary school teacher professionalism.

Therefore, this study focuses on testing a model that integrates principals' managerial competencies and teachers' TPACK as predictors of elementary school teacher professionalism within a single analytical framework. This study also provides empirical evidence on public elementary schools in Rumbai District, Pekanbaru City, an area that has been under-researched in previous studies. Therefore, this research is expected to enrich studies on teacher professionalism while offering recommendations to strengthen school leadership and develop teacher competencies to meet the demands of 21st-century education.

LITERATURE REVIEW

Teacher Professionalism

Teacher professionalism is a fundamental concept in education with broad and complex dimensions. According to Kunandar (2011), professionalism can also be defined as the condition, direction, purpose, and quality of expertise and authority related to a person's livelihood. In line with this perspective, teacher professionalism is not only demonstrated through mastery of specific competencies but also through a commitment to continuously develop professional abilities in accordance with developments in science and technology and the needs of students (Hapizoh et al., 2020). The characteristics of a professional person include: (1) Having a standard selection mechanism so that only those who are competent may carry out the job or profession, (2) The community recognizes the services provided based on the possession of a set of knowledge and skills that support the profession, (3) A certain educational process is required before a person can or can carry out the duties of the profession, and (4) Having a professional organization to protect the interests of its members and improve services to the community (Kristiawan & Rahmat, 2018). The OECD (2023) emphasizes that teacher professionalism comprises competence, professional autonomy, and a commitment to continuous self-development. Numerous studies have shown that teacher professionalism significantly improves the quality of learning, student engagement, and student learning outcomes. Therefore, enhancing teacher professionalism is a key priority in developing 21st-century education.

The Concept of Principal Managerial Competence

Managerial competence is the principal's ability to motivate, guide, protect, set an example, encourage, and assist in achieving the school's goals (Dawam et al., 2022). A principal's managerial competence enables them to perform management functions effectively and achieve optimal educational goals. From the perspective of modern educational leadership, the principal plays not only the role of administrator but also that of instructional leader, capable of creating a work environment that supports teacher professional development. (Pont, 2020) explains that effective school leadership makes a significant contribution to improving teacher quality by strengthening school culture, providing academic supervision, and supporting continuous professional development. Results from various studies indicate that the principal's managerial competence is positively related to teacher performance, work motivation, learning innovation, and teacher professionalism. Thus, the principal's managerial competence can be viewed as an external factor that plays a vital role in fostering improvements in teacher professionalism.

TPACK

Technological Pedagogical and Content Knowledge (TPACK), or pedagogical and content technology knowledge, is the knowledge of how to use technology effectively in pedagogy to teach content well (Hayati et al., 2020). According to (Koehler et al., 2013) Technological Pedagogical Content Knowledge (TPACK) is a new form of knowledge that goes beyond the three "core" components (content, pedagogy, and technology) with the intention of TPACK is an understanding that arises from the interaction between content knowledge, pedagogy, and technology. TPACK is a framework that integrates the relationships among components of

technology, pedagogy, and content knowledge (Spector et al., 2014). In line with that, Li et al. (2025) found, in their systematic review, that mastery of TPACK contributes to improving the quality of learning, teacher creativity, and the effectiveness of technology integration in the classroom. Furthermore, Mane (2025) stated that teachers with high TPACK competencies tend to be better prepared for digital transformation and able to create more meaningful learning experiences for students. Therefore, TPACK is an important indicator of teacher professionalism in the 21st century.

METHOD

This study employed a quantitative ex post facto method. The population consisted of 360 public elementary school teachers from 20 public elementary schools in Rumbai District, Pekanbaru City. The sample size, calculated using the Slovin formula, was 190. The sampling technique used was proportional random sampling. A pilot study was conducted with 30 elementary school teachers outside the sample. The study was conducted from October 2025 to March 2026 at public elementary schools.

The data collection technique is a questionnaire distributed directly to the research sample, with the following response options: Always (SL), Often (SR), Sometimes (KK), Rarely (JR), and Very Rarely (SJ). The questionnaire for each variable is compiled based on variable indicators with the number of statements: (a) teacher professionalism consists of 9 indicators totaling 56 items consisting of 47 positive items and 9 negative items; (b) principal managerial competence consists of 5 indicators, statement items in this variable totaling 42 items consisting of 37 positive items and 5 negative items; and (c) teacher TPACK consists of 7 indicators, statements totaling 38 items consisting of 31 positive items and 7 negative items.

The indicators used in the teacher professionalism variable are adapted from (Kunandar, 2011b; Mulyasa, 2015) Law Number 14 of 2005, namely: (1) Mastery of subject matter, (2) development of learning materials, (3) application of learning strategies/methods, (4) utilization of learning technology, (5) implementation of learning assessments, (6) reflection for learning improvement, (7) application of deep learning principles, (8) role model and authority, and (9) communication and social relations. The principal's managerial competency indicators were adapted from (Minister of National Education Regulation No. 13 of 2007; Terry, 2014; Snyder, 1986; Mulyasa, 2015), namely: (1) Planning ability, (2) Organizing ability, (3) Actuating ability, (4) Controlling ability, and (5) Evaluating ability. The TPACK indicators were adopted from (Schmidt, 2009): (1) Technology Knowledge, (2) Content Knowledge, (3) Pedagogical Knowledge, (4) Pedagogical Content Knowledge, (5) Technological Content Knowledge, (6) Technological Pedagogical Knowledge, and (7) Technological Pedagogical Content Knowledge.

Before being used in the study, the instrument was tested on 30 public elementary school teachers in Rumbai Barat District who were similar to the study population. The validity test was conducted using Pearson's Product-Moment correlation, and the reliability test used Cronbach's alpha with SPSS version 26. The validity test results showed that several items that did not meet the validity criteria were eliminated, resulting in final instruments of 49 items for teacher professionalism, 37 for principal's managerial competency, and 36 for teachers' TPACK. Furthermore, the reliability test results showed Cronbach's Alpha values of 0.968, 0.961, and 0.957, respectively, indicating that all instruments had very high reliability and were suitable for use in the study.

The research data were analyzed using SPSS (Statistical Package for Social Science) Version 26. The techniques used to analyze the data were descriptive and inferential statistical analyses, including classical assumption testing and hypothesis testing. The Classical Assumption Test consists of the Normality Test and the Linearity Test. Hypothesis testing consists of the F-Test, the Regression Test, and the Determinant Test. The hypotheses to be tested are:

Ho: $\rho_{12} \leq 0$ means there is no significant effect of principal managerial competence and teacher TPACK on teacher professionalism.

Ha: $\rho_{12} > 0$ indicates a significant effect of principal managerial competence and teacher TPACK on teacher professionalism.

Furthermore, to facilitate the research, the following conceptual framework can be presented:

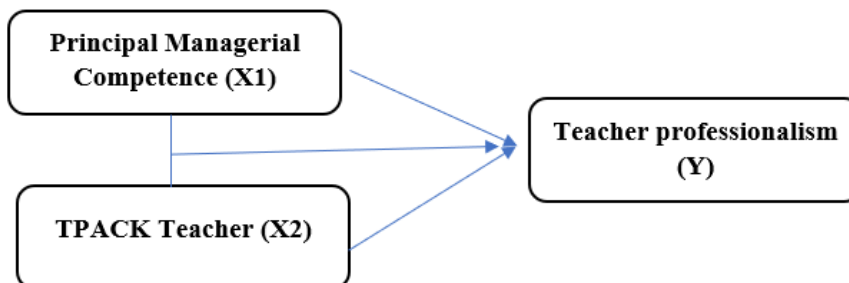


Figure 1 Constellation Model of Influence of Variables

RESULTS AND DISCUSSION

Descriptive Statistical Analysis

Table 1. Mean Values of Research Variables

No	Variable	Mean	SD	Interpretation
1	Teacher Professionalism	4.16	0.51	high
2	Principal Managerial Competence	4.38	0.48	Very high
3	TPACK Teacher	4.07	0.53	high
Average		4.20	0.51	High

Source: Processed data 2026

The analysis shows that all three variables are generally in the high category with an average of 4.20 (SD 0.51). The principal's managerial competence has the highest score (4.38; SD 0.48) and is included in the very high category, while teacher professionalism (4.16; SD 0.51) and teacher TPACK (4.07; SD 0.53) are in the high category. This indicates that conditions are generally good, but teacher TPACK still needs improvement, especially in technology integration in learning.

Inferential Statistical Analysis

Classical Assumption Test

a. Normality Test

Table 2. Results of the Kolmogorov-Smirnov Normality Test

	Teacher Professionalism * Principal Managerial Competence	Teacher Professionalism * Teacher TPACK
N	190	190
Test Statistic	0.059	0.050
Asymp, Sig, (2-tailed)	.200 ^{c,d}	.200 ^{c,d}

Source: Processed data 2026

The analysis showed that the correlation test yielded a significance value of 0.200 for both pairs of variables: teacher professionalism and principal managerial competence, and teacher professionalism and teacher TPACK. This value is greater than 0.05, indicating that the data are normally distributed and that there

are no significant deviations. Therefore, the assumption of normality has been met, allowing further analysis to use parametric tests.

b. Linearity Test

Table 3. Results of the Linearity of Variance Test for Variables

1) Variable	Sig
Teacher Professionalism * Principal Managerial Competence	0.063
Teacher Professionalism * Teacher TPACK	0.055

Source: Processed data 2026

The analysis shows that the linear relationships between teacher professionalism and principal managerial competence (0.063) and between teacher professionalism and teacher TPACK (0.055) are 0.063 and 0.055, respectively. Both values are greater than 0.05, so it can be concluded that there is a linear relationship between these variables.

This indicates that principal managerial competence and teacher TPACK are significantly related to teacher professionalism, and that improvements in both aspects of teacher professionalism can follow.

Research Hypothesis Testing

F Test

The F test is used to determine whether the independent variables simultaneously have a significant effect on the dependent variable.

Table 4 Results of Multiple Linear Regression Test (F Test)

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	10.683	2	5.342	69.124	.000 ^b
Residual	14.451	187	.077		
Total	25.134	189			

a. Dependent Variable: Teacher Professionalism

b. Predictors: (Constant), Teacher TPACK, Principal Managerial Competence

Source: Processed data 2026

The calculated F-value is 69.124, while the F-table value for 190 respondents ($df_1 = 2$ and $df_2 = 187$) is approximately 3.04. These results indicate that the F-table < the calculated F-value, which is $3.04 < 69.124$. Furthermore, the significance value is $0.000 < 0.05$, indicating a significant influence of the principal's managerial competence on teachers' TPACK and teacher professionalism. This means that H_a is accepted and H_0 is rejected.

Multiple Regression Test

A multiple regression test was conducted to examine the relationship between the independent variables, namely the principal's managerial competence and TPACK, and the dependent variable, teacher professionalism.

Table 5 Results of Multiple Linear Regression Analysis

		Coefficients ^a				
	Model	B	Std. Error	Beta	t	Sig
1	(Constant)	1.503	.238		6.308	.000
	Principal Managerial Competence	.187	.055	.214	3.381	.001
	Teacher TPACK	.451	.055	.521	8.244	.000

a. Dependent Variable: Teacher Professionalism

Source: Processed data 2026

Next, to see the direction of influence, based on Table 4.4, the following regression equation can be used:

$$\hat{Y} = 1,503 + 0,187 X_1 + 0,451 X_2$$

According to this equation, both independent variables positively influence teacher professionalism. This is evident from the regression coefficients, namely 0.187 for the principal's managerial competence (X1) and 0.451 for the teacher's TPACK (X2), indicating that increases in these two variables will lead to higher teacher professionalism.

Based on the coefficient values, teacher TPACK ($\beta = 0.521$) has a stronger influence than the principal's managerial competence ($\beta = 0.214$). Furthermore, based on the significance values of each variable (0.001 and 0.000), which are less than 0.05, it can be concluded that both variables have a significant influence on teacher professionalism.

Determinant Test

Table 6. Results of the Test of the Influence of Principal Managerial Competence (X1) and Teacher TPACK (X2) on Teacher Professionalism (Y)

R	R Square	Sig, F Change	Pengaruh (%)	Tafsiran
0.652 ^a	0.425	0.000	42.5%	Sedang

a. Predictors: Teacher TPACK, Principal Managerial Competence

b. Dependent Variable: Teacher Professionalism

Based on the coefficient of determination analysis, an R value of 0.652 was obtained, indicating a strong relationship between the independent variables and teacher professionalism. The R Square value of 0.425 indicates that the principal's managerial competence and teachers' TPACK jointly account for 42.5% of the variance in teacher professionalism, which is categorized as moderate. Meanwhile, the F Change significance value of 0.000 (<0.05) indicates a significant influence. Thus, it can be concluded that both variables contribute significantly to teacher professionalism, although other factors outside the model also contribute.

DISCUSSION

Principal managerial competence and teacher TPACK jointly have a positive and significant effect on teacher professionalism. This is indicated by a significance value of 0.000 (<0.05) and a calculated F-value exceeding the F-table value, thus indicating the model is feasible. The coefficient of determination of 42.5% indicates that improving teacher professionalism cannot depend solely on individual teacher abilities but also requires the support of a well-managed school organizational environment under the principal's leadership. Variables outside the model influence the remaining 57.5%. Teacher professionalism results from the interaction between internal and external factors. Internal factors are reflected in teachers' ability to integrate

technology, pedagogy, and learning content, while external factors are reflected in the principal's ability to create work systems, school culture, and organizational climate that support teacher professional development.

Teacher professionalism, as reflected in mastery of subject matter, is the primary foundation that demonstrates a teacher's academic capacity to convey learning content accurately and in depth (Susanti et al., 2023). This capability is strengthened through the development of learning materials, in which teachers not only convey textbook content but also adapt and contextualize it to suit students' needs. Furthermore, the application of learning strategies and methods demonstrates pedagogical competence, enabling teachers to create active, innovative, and student-centered learning environments. Although learning technology is considered good, it still shows room for improvement, indicating that technology integration as part of TPACK is not yet fully optimized in learning practices.

The next indicator, the implementation of learning assessments, shows that teachers can systematically evaluate learning outcomes, although this still needs to be developed into authentic, technology-based assessments. This relates to reflection for improvement, where teachers are required to conduct self-evaluations to continuously enhance the quality of learning. Furthermore, the application of deep learning principles demonstrates that teachers have moved toward a learning approach that is not solely outcome-oriented but also focuses on students' critical thinking processes and conceptual understanding. In the context of personality, exemplary behavior and authority are important aspects that reflect a teacher's integrity and professionalism as a respected figure. Meanwhile, communication and social relations demonstrate a teacher's ability to build positive interactions with students and within the school environment, which in turn shapes a conducive learning climate.

This finding aligns with the management concept proposed by Terry, George R., and Rue (2014), which states that organizational success is largely determined by the functions of planning, organizing, implementing, and supervising. When these functions are carried out effectively, teachers receive adequate support to improve their competencies, innovate in learning, and develop professional practices sustainably (Mista, 2020). This is supported by Mulyono, H., Amalia, R., & Anam (2023) and Rivana, A., Pao, C., Zahir, R., & Misransyah (2024), who state that strong principal managerial competence contributes to improving teacher performance and achieving educational goals in schools.

In addition to principal managerial competence, teachers' TPACK (Comprehensive Action Research) skills are also important factors in enhancing professionalism. The TPACK concept proposed by Koehler et al., (2013) emphasizes that professional teachers must be able to synergistically integrate knowledge of technology, pedagogy, and content in the learning process. This capability enables teachers to design learning that is more contextual, innovative, and tailored to student needs. This is supported by Nasrul, Muhammad; Hidayat, Faiz; Dewi, Wilda Purnama; and Musa (2025), who state that TPACK can strengthen teachers' abilities to develop effective learning in the digital age. Mastery of technology alone is not sufficient; it must be integrated with pedagogical skills and mastery of the material to produce effective, relevant learning that meets students' needs.

The ability to integrate TPACK is becoming increasingly important as technological developments in education advance. Learning is no longer centered on textbooks; it has shifted toward using digital technology as a medium and learning resource. Therefore, teachers are required not only to master the material but also to use technology appropriately in the learning process.

Teacher quality and school principals' managerial competence are key factors influencing success. educational outcomes (Wati, F., Okilanda, A., Az Zahra, F., Arif, K., Rozi, M. F., Arnaldo, Y., & Saputra, 2024). Teachers act as motivators and disciplinarians, significantly impacting student achievement and the overall educational process. Furthermore, strong managerial competence of principals is crucial for creating policies and strategies that improve school management and teacher performance (Ijayani et al., 2023). Furthermore, Robinson (2011) found that effective principal managerial competence directly improves the quality of teacher teaching.

The results of this study provide important implications for elementary school management. Efforts to improve teacher professionalism need to be carried out comprehensively by strengthening principals' managerial competence and continuously improving teachers' TPACK competence. Principals need to act as learning leaders capable of facilitating training, mentoring, and academic supervision, as well as creating a school culture that supports learning innovation (Anas, 2021; Rosnaini et al., 2024). At the same time, teachers need to be encouraged to improve their ability to utilize technology as an integral part of the learning process, not simply as an aid, (Dupitas, 2026). Therefore, teacher professional development programs should not only focus on improving pedagogical and professional competencies, but also on strengthening digital literacy and the ability to integrate technology into learning.

CONCLUSIONS AND RECOMMENDATION

Principals' managerial competencies and teachers' TPACK simultaneously have a positive and significant influence on teacher professionalism, contributing 42.5%. This means that teacher professionalism is determined not only by internal factors (TPACK competencies) but also by external factors (principal leadership and management). The remaining 57.5% is influenced by other variables outside this study, such as work motivation, organizational culture, school climate, and others. Synergy between the two is key to creating an optimal learning environment. Principals with strong managerial skills can create a work climate that supports teacher competency development, including in the use of learning technology. Furthermore, teachers with strong TPACK competencies will find it easier to develop innovative, effective learning that meets the demands of 21st-century education. Based on the research results, it is recommended that school principals enhance their managerial competencies to support teacher professional development, and that teachers continue to develop their TPACK competencies to create innovative learning that meets the demands of 21st-century education. Schools and education offices are also expected to provide facilities and ongoing training programs to support improvements in teacher quality and learning in elementary schools.

This study has several limitations. First, the study was conducted only among public elementary school teachers in Rumbai District, Pekanbaru City, so generalizing the results to other regions or educational levels requires caution. Based on these limitations, future research is recommended to involve a broader research area, use a mixed methods approach to obtain more comprehensive data, and include other variables that could potentially influence teacher professionalism, such as work motivation, organizational culture, job satisfaction, school climate, transformational leadership, and teacher digital competence. This will allow for a more in-depth and comprehensive understanding of the factors influencing teacher professionalism.

Credit authorship contribution statement

First Author: Research conceptualization, methodology development, formal data analysis, data curation, and writing the original draft of the research manuscript. Second Author: Methodology development, research resource provision, project administration and coordination, data validation, and research implementation supervision. Third Author: Research funding acquisition, formal analysis, data curation, and final review and editing of the research manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Ethical Declaration

All participants provided informed consent prior to their involvement in the study. They were informed about the study's purpose, procedures, and their right to withdraw at any time without consequence.

Acknowledgment

The author would like to express his gratitude to all parties who provided support, assistance, and contributions to the implementation of this research. Special thanks are extended to the schools, principals, and elementary school teachers in Rumbai District who volunteered to participate as respondents and provided the data and information needed for this research. He also expresses his gratitude to the relevant institutions, colleagues, and all parties who provided moral and material support, enabling the successful completion of this research.

REFERENCES

- Anas, A. (2021). Peran Kepala Sekolah Terhadap Peningkatan Kompetensi Profesionalitas Guru Pada Proses Pembelajaran Di Sdn 22 Bengkalis. *Jurnal PAJAR (Pendidikan Dan Pengajaran)*, 5(6), 1753–1759. <https://doi.org/10.33578/pjr.v5i6.8591>
- Dahlan. (2016). Pengaruh Kompetensi Manajerial Kepala Sekolah Terhadap Kompetensi Sosial Guru Di Sma Negeri 11 Makassar. *Gema Kampus IISIP YAPIS Biak*, 11(1), 55–62. <https://doi.org/10.52049/gemakampus.v11i1.17>
- Dawam, Bastian, A., & Heri, H. (2022). Pengaruh Kompetensi Manajerial dan Kepemimpinan Demokratik Kepala Sekolah terhadap Kinerja Guru melalui Motivasi Kerja. *Lectura: Jurnal Pendidikan*, 13(1), 65–85. <https://doi.org/10.31849/lectura.v13i1.9330>
- Dupitas, M. L. Y. (2026). Tpack Level and Tpack Self-Efficacy of Pre-Service Teachers: Implications For An Sdg-Aligned Professional Development Plan. *Jurnal PAJAR (Pendidikan Dan Pengajaran)*, 10(3), 347–357. <https://doi.org/10.33578/pjr.v10i3.1428>
- Hapizoh, H., Harapan, E., & Destiniar, D. (2020). Pengaruh Profesionalisme Guru Dan Supervisi Kepala Sekolah Terhadap Kinerja Guru. *JMKSP (Jurnal Manajemen, Kepemimpinan, Dan Supervisi Pendidikan)*, 5(2), 168. <https://doi.org/10.31851/jmksp.v5i2.3764>
- Hayati, E., Rahmadi, F., & Nursyifa, A. (2020). Analisis Technological Pedagogical And Content Knowledge (TPACK) Calon Guru Pendidikan Pancasila Dan Kewarganegaraan (PPKn). *Prosiding Seminar Nasional*.
- Ijayani, I., Sumarno, S., Yuanita, P., Natuna, D. A., & Pujiyanto, Y. (2023). The Influence of Work Ethics and Commitment of the Principal on the Visionary Leadership at Junior High School. *AL-ISHLAH: Jurnal Pendidikan*, 15(3), 3937–3946. <https://doi.org/10.35445/alishlah.v15i3.3043>
- Koehler, M. J., Mishra, P., & Cain, W. (2013). What Is Technological Pedagogical Content Knowledge (TPACK)? Michigan State University. *Journal of Education*, 193(3), 13–19.
- Kristiawan, M., & Rahmat, N. (2018). Peningkatan Profesionalisme Guru Melalui Inovasi Pembelajaran. *Jurnal Iqra': Kajian Ilmu Pendidikan*, 3(2), 373–390.
- Kunandar. (2011). *Guru Profesional: Implementasi Kurikulum Tingkat Satuan Pendidikan (KTSP) dan Sukses dalam Sertifikasi Guru*. Rajagrafindo.
- Li, M., Vale, C., Tan, H., & Blannin, J. (2025). A systematic review of TPACK research in primary mathematics education. *Mathematics Education Research Journal*, 37(2), 281–311. <https://doi.org/10.1007/s13394-024-00491-3>
- Mane, M. S. B. (2025). Teachers' Readiness and the Integration of Technology in Teaching. *International Journal of Multidisciplinary and Current Educational Research (IJMCER)*, 7(3), 260–290.
- Mista, R. (2020). The Role Of School Principal In Improving Teacher's Professional Competence In The Elementary School. *Jurnal PAJAR (Pendidikan Dan Pengajaran)*, 4(3), 624–634. <https://doi.org/10.33578/pjr.v4i2.8005>
- Mulyasa. (2015). *Guru Dalam Implementasi Kurikulum 2013*. PT Remaja Rosdakarya.
- Mulyono, H., Amalia, R., & Anam, S. (2023). Developing academic writing creativity and self-efficacy through an online academic writing workshop: A pilot study. *Cogent Education*, 10(1). <https://doi.org/10.1080/2331186X.2023.2237319>

- Nasrul, Muhammad; Hidayat, Faiz; Dewi, Wilda Purnama ; Musa, A. (2025). Pelatihan Integrasi TPACK sebagai Strategi Penguatan Keterampilan Guru dalam Pembelajaran Berbasis Teknologi Informasi. *Jurnal Ilmu Pendidikan*, 1(3). <https://doi.org/10.65094/man86v92>
- Nur, S., & Mardiah, M. (2020). Pentingnya Profesionalisme Guru dalam Pendidikan. *Al-Liqo: Jurnal Pendidikan Islam*, 5(02), 215–228. <https://doi.org/10.46963/alliqo.v5i02.245>
- Pont, B. (2020). A literature review of school leadership policy reforms. *European Journal of Education*, 55(2), 154–168. <https://doi.org/10.1111/ejed.12398>
- Rivana, A., Pao, C., Zahir, R., & Misransyah, M. (2024). The Role of School Principals in Promoting Inclusive Education. *International Journal of Educational Narratives*, 2(6), 515–524. <https://doi.org/10.70177/ijen.v2i6.1745>
- Robinson, V. M. J. (2011). *Student-Centered Leadership*. Jossey-Bass.
- Rohmanurmeta, F. M., Susilo, H., Zainuddin, M., & Hadi, S. (2023). Effectiveness of TPACK types based on constructionist activities on students technological literacy ability. *Premiere Educandum : Jurnal Pendidikan Dasar Dan Pembelajaran*, 13(2), 118–131. <https://doi.org/10.25273/pe.v13i2.16895>
- Rosnaini, Azhar, & Yuanita, P. (2024). Leadership Management of the Principal in Improving the Quality of Learning at SD Negeri 17 Bukitraya. *Jurnal PAJAR (Pendidikan Dan Pengajaran)*, 8(6), 531–539. <https://doi.org/10.33578/pjr.v8i6.9668>
- Spector, J. M., Merrill, M. D., Elen, J., & Bishop, M. J. (2014). Handbook of Research on Educational Communications and Technology. In *Contemporary Educational Technology* (Fourth Edi). Springer. <https://doi.org/10.30935/cedtech/5962>
- Suhardi, S. (2019). Kompetensi Manajerial Kepala Sekolah, Kompensasi dan Kepuasan Kerja Terhadap Kinerja Guru Pada SMK Swasta Di Kota Batam. *Coopetition : Jurnal Ilmiah Manajemen*, 9, 35–46. <https://doi.org/10.32670/coopetition.v9i1.50>
- Susanti, N., Faizah, H., Sinaga, M., & Ijayani, I. (2023). The Effect Of Principal Transformational Leadership And Teacher Digital Literacy On State High School Teacher Professionalism. *AL-ISHLAH: Jurnal Pendidikan*, 15(4), 6457–6467. <https://doi.org/10.35445/alishlah.v15i4.3113>
- Terry, George R; Rue, L. W. (2014). *Dasar-Dasar Manajemen*. Bumi Aksara.
- Wati, F., Okilanda, A., Az Zahra, F., Arif, K., Rozi, M. F., Arnaldo, Y., & Saputra, H. Y. (2024). Workshop Pemanfaatan Articulate Storyline Bagi Guru Untuk Mengembangkan Media Pembelajaran Berdiferensiasi. *Wahana Dedikasi*. <https://doi.org/10.31851/dedikasi.v7i1.14345>
- Wiguna, A. C., Budiman, N., & Sardin. (2024). Hubungan Penguasaan Technological Pedagogical Content Knowledge (Tpack) Guru Terhadap Motivasi Guru Dalam Penggunaan Teknologi Dalam Pembelajaran Di Sekolah Dasar. *Buletin Literasi Budaya Sekolah*, 116–127. <https://doi.org/10.23917/blbs.v6i2.7853>
- Wiwik, & Murniyati, S. (2025). Transformasi Pendidikan: Kebutuhan dan Tantangan Kompetensi Guru dalam Menghadapi Era Digital Abad-21. *JANACITTA*, 8(2), 359–367. <https://doi.org/10.35473/janacitta.v8i2.4197>