

The Influence of Digital Leadership on Teacher Performance Through Digital Literacy Competence in the Era of Digital Education Transformation

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ABSTRACT

This study aims to analyze the influence of Digital Leadership on Junior High School Teachers' Performance in Pangkalpinang through Digital Literacy Competence as a mediating variable in the era of digital education transformation. The research is grounded in the urgent need for the education sector to adapt to technological advancements, where teachers are not only educators but also digital leaders capable of integrating technology into learning practices. This research employs a quantitative approach using the Partial Least Squares (PLS) method, involving 179 junior high school teachers as respondents. The research instrument was developed using a five-point Likert scale with indicators measuring digital leadership, digital literacy, and teacher performance. The findings reveal that Digital Leadership has a positive and significant effect on Teacher Performance, both directly and indirectly through Digital Literacy Competence as a partial mediator. This indicates that the higher a teacher's digital leadership capability, the stronger their digital literacy competence, which subsequently enhances professional performance. The results emphasize the strategic role of digital literacy as a bridge that reinforces the effectiveness of digital leadership in educational settings. The study provides theoretical implications for the development of digital leadership models in education and practical implications for policymakers in designing teacher training programs based on digital competency.

Keywords: *Digital Leadership, Digital Literacy Competence, Teacher Performance, Educational Transformation*

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INTRODUCTION

Digital transformation has become a major force that has changed almost every aspect of life, including education. The 4.0 industrial revolution and the acceleration of information technology require educational institutions to adapt to changes in learning patterns, school management, and even the way teachers interact with students. Amidst these changes, teachers are not only required to be educators but also digital leaders who are able to effectively integrate technology into the learning process. This role requires teachers to have the ability to manage information, utilise learning technology, and foster a positive digital culture in the school environment. This situation makes digital leadership skills one of the strategic competencies that modern educators must possess.

However, mastery of technology does not necessarily guarantee improved teacher performance if it is not accompanied by adequate digital literacy skills. Digital literacy is not only about the ability to use devices or applications, but also includes critical thinking skills, ethics in the use of technology, and awareness of digital security and privacy. Teachers with high digital literacy can select credible learning resources, manage digital media responsibly, and develop teaching materials that are relevant to the needs of students in the digital age. In this context, digital literacy acts as a bridge between digital leadership and teacher performance – ensuring that the use of technology is not merely mechanical, but also meaningful and oriented towards improving the quality of learning.

Previous studies have shown that digital leadership has a significant effect on improving work effectiveness and the ability to adapt to technological changes (Avolio et al., 2014; Kane et al., 2019). Meanwhile, digital literacy competence has been proven to be an important mediating factor that explains how digital leadership skills can be translated into better work outcomes (Ng, 2012; Spante et al., 2018). In the context of education in Indonesia, particularly at the teacher level, this ability still faces challenges, ranging from technological access gaps, lack of digital-based training, to low levels of technology utilisation in daily learning activities. This condition reinforces the urgency of research that comprehensively examines the relationship between digital leadership, digital literacy, and teacher performance.

This study was conducted on 179 teachers as respondents to describe the structural relationship between three main variables: Digital Leadership, Digital Literacy Competence, and Performance. Using a quantitative approach based on Generalised Structured Component Analysis (GSCA), this study aims to examine the direct and indirect effects of digital leadership on teacher performance through digital literacy competence. The results of this study are expected to provide an empirical description of how improving teachers' digital leadership skills can promote digital literacy, which in turn strengthens their professional performance.

Theoretically, this study is expected to enrich the literature on the relationship between digital transformation and human resource performance in the education sector, particularly in the context of teachers as the main agents of change. Meanwhile, in practical terms, the results of this study can serve as a basis for educational institutions, local governments, and policymakers to design teacher competency development programmes that are more oriented towards strengthening leadership and digital literacy. Thus, this study is not only relevant in an academic context, but also has a real impact on efforts to realise adaptive, innovative, and competitive education in the digital age.

The rapid development of digital technology has driven significant changes in various sectors, including education. In this context, digital leadership has become an important variable that determines the extent to which leaders, especially head teachers and teachers, are able to utilise technology to improve the effectiveness of learning and education management. According to Kane et al. (2019), digital leadership encompasses an individual's ability to understand the potential of technology, direct digital-based change, and foster a culture of innovation in the workplace. A digital leader not only masters technological tools, but also acts as a catalyst for transformation, capable of motivating colleagues towards more collaborative and data-driven work practices. In the context of teachers, digital leadership means their ability to lead the learning process by strategically utilising technology to improve student learning outcomes.

The concept of digital literacy competence is also an important aspect of this study. Digital literacy is defined as an individual's ability to access, evaluate, utilise, and create information using digital technology ethically and effectively (Ng, 2012). In the world of education, teachers with high levels of digital literacy are not only able to use technology in the teaching and learning process, but also understand the social and ethical implications of using such technology. Digital literacy acts as a bridge between technical skills and critical and reflective thinking skills. Several previous studies, such as those by Spante et al. (2018), show that digital literacy has a positive influence on improving performance and learning effectiveness in schools, because digitally literate teachers are more adaptive to changes in technology-based learning systems.

Furthermore, the variable of performance in the context of education can be defined as the work output or level of achievement of individuals in carrying out their professional duties in accordance with competency standards. Teacher performance can be measured through indicators such as learning effectiveness, mastery of learning technology, innovation in teaching methods, and the ability to produce optimal learning outcomes for students. According to the performance theory by Armstrong and Baron (2005), performance is the

result of synergy between ability, motivation, and work opportunities facilitated by the organisation. In the digital era, digital literacy and digital leadership have become major determinants in shaping teacher performance, as these two variables influence how teachers plan, implement, and evaluate technology-based learning activities.

The relationship between digital leadership and digital literacy competencies has been extensively studied in various research, with results showing that digital leadership has a positive influence on improving individual digital literacy (Hidayat & Setiawan, 2021). Effective digital leaders are able to create a work environment that supports continuous learning, knowledge sharing, and the use of technology in professional activities. In the context of teachers, digital leadership not only plays a role in inspiring the use of technology but also facilitates training and mentoring to improve digital literacy competencies. Therefore, teachers who act as digital leaders in the classroom tend to have higher digital literacy skills, as they are accustomed to taking initiative and adapting to technological developments.

In addition, the relationship between digital literacy competence and performance shows that digital literacy acts as a mediating variable that bridges the influence of digital leadership on performance. This mediation theory can be explained through the perspective of the Technology Acceptance Model (TAM) developed by Davis (1989), in which technology acceptance and mastery play an important role in increasing work efficiency and productivity. Teachers with high digital literacy are better able to integrate technology into the curriculum, use learning data for decision-making, and develop innovative teaching materials that increase student engagement. Thus, digital literacy competency is not only a technical skill, but also a form of adaptive readiness for change in the modern world of education.

The Relationship Between Digital Leadership and Teacher Performance

Digital leadership significantly influences teacher performance by fostering an environment conducive to technology integration and professional growth. Research shows that effective digital leaders improve teachers' digital literacy, promote innovative pedagogical practices, and foster a collaborative culture within educational institutions. This multifaceted impact is evident in several key areas. Digital leaders provide training and resources that improve teachers' proficiency with technology, enabling them to effectively integrate digital tools into their teaching practices (Saeed & Kang, 2024). Increased digital literacy among teachers correlates with increased student engagement and learning outcomes, as teachers become more proficient in utilising technology in the classroom (Timan et al., 2022).

Leadership practices that encourage collaboration among teachers lead to shared learning experiences and innovative teaching strategies (Xin et al., 2025). Digital leaders create a culture of innovation, where teachers feel empowered to experiment with new methods and technologies, which ultimately improves their performance (Hasanah & Yusoff, 2024). Continuous professional development initiatives led by digital leaders help teachers adapt to evolving educational demands and improve their pedagogical effectiveness (Sari et al., 2024). By aligning professional development with digital transformation goals, schools can ensure that teachers are well-equipped to meet the challenges of modern education (Timan et al., 2022).

H1: Digital Leadership has a positive and significant effect on Teacher Performance.

The Relationship Between Digital Leadership and Digital Literacy Competencies

Digital leadership significantly influences digital literacy competencies by shaping the environment in which individuals develop their digital skills. Effective digital leaders foster a culture of innovation and provide resources that enhance digital literacy among their teams. However, the relationship is complex and can vary across contexts, as evidenced by various studies.

Vision and Support, Digital leaders establish a clear vision for digital integration and provide the necessary support, which can improve digital literacy among employees and faculty (Giray, 2025; Javed & Nayyar, 2025). Resource Allocation: Leaders who allocate resources effectively enable access to training and tools that enhance digital skills (Giray, 2025;

Haryanti & Purbojo, n.d.). Engagement and Performance: In sectors such as telecommunications, strong digital leadership correlates with increased employee engagement and performance, driven by improved digital literacy (Javed & Nayyar, 2025).

While leadership plays a role, personal motivation and professional development opportunities are crucial for faculty members' digital literacy, indicating that leadership alone may not be sufficient (Giray, 2025). Transformational Leadership: Transformational leadership styles have a positive impact on pedagogical competence, indicating that the approach taken by leaders can influence how digital literacy is integrated into practice (Haryanti & Purbojo, n.d.). Conversely, some studies show that digital literacy can also develop independently of leadership, emphasising the importance of individual initiative and peer collaboration in developing digital skills (Giray, 2025).

H2: Digital Leadership has a positive and significant effect on Digital Literacy Competence.

The Relationship Between Digital Literacy Competence and Teacher Performance

Digital literacy competencies significantly impact teacher performance by improving teaching quality, encouraging pedagogical modification, and increasing self-efficacy. When educators develop their digital skills, they become more adept at integrating technology into their teaching practices, leading to greater student engagement and improved learning outcomes. The following section outlines these key aspects.

Digital literacy enables teachers to effectively utilise evidence-based instructional strategies, resulting in higher teaching performance ratings (Lloren & Chavez, 2025). Educators with strong digital skills can adapt their teaching methods to incorporate technology, which is essential in modern classrooms (Park & Yoon, 2023). Teachers' digital literacy competencies correlate positively with their ability to modify pedagogical approaches, enabling more tailored and effective instruction (Park, 2023). Younger teachers, in particular, demonstrate greater adaptability to technology, enhancing their instructional capabilities (Park & Yoon, 2023).

Digital literacy contributes to increased self-efficacy among teachers, which in turn positively influences their performance (Setyawan et al., 2022). Organisational support plays an important role in strengthening the impact of digital literacy on teacher effectiveness, indicating that an institutional framework is essential for maximising this competency (Setyawan et al., 2022).

H3: Digital Literacy Competence has a positive and significant effect on Teacher Performance.

The Relationship Between Digital Leadership and Teacher Performance Through Digital Literacy Competencies

Digital leadership significantly influences teacher performance by improving digital literacy competencies, which are essential for effective technology integration in educational settings. Digital leadership, as demonstrated by head teachers and educational leaders, fosters an environment that encourages the development of digital skills among teachers, thereby improving their performance. This relationship is supported by various studies that highlight the importance of digital literacy in adapting to the digital age and achieving educational goals. The following section outlines how digital leadership influences teacher performance through digital literacy competencies.

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Digital literacy is essential for teachers to adapt and communicate effectively in various educational contexts. It enables teachers to utilise technology to enhance learning experiences and outcomes (Amalia et al., 2024; Haryanti & Purbojo, n.d.). Teachers' digital literacy skills are part of their professional competencies, which are necessary for integrating Information and Communication Technology (ICT) into their pedagogical practices. This integration is facilitated by transformational leadership, which supports the development of these competencies (Haryanti & Purbojo, n.d.).

The integration of digital literacy and leadership styles, such as transactional and transformational leadership, significantly impacts the quality of student learning. Teachers who effectively apply digital literacy in their teaching can create a dynamic and participatory learning environment, which leads to increased student motivation and learning outcomes (Syahreza et al., 2024). While digital leadership and literacy are crucial for improving teacher performance, it is important to consider the challenges and complexities involved in technology integration. Future research should explore the causes and effects of technology integration to address these complexities and further enhance teacher engagement and digital performance (Mehmood, 2023).

H4: Digital Literacy Competence mediates the effect of Digital Leadership on Teacher Performance.

METHOD

This study uses a quantitative approach with the Partial Least Square-Structural Equation Modelling (PLS-SEM) method to examine the relationship between the variables of Digital Leadership, Digital Literacy Competence, and Teacher Performance in junior high schools in Pangkalpinang City. This approach was chosen because it is capable of examining complex relationships between reflective latent variables and is suitable for moderate sample sizes with data distributions that are not always normal. This study is explanatory in nature, with the aim of explaining the direct and indirect effects between variables and identifying the mediating role of Digital Literacy Competence in the relationship between Digital Leadership and Teacher Performance.

The population in this study was all junior high school teachers in Pangkalpinang City. The sampling technique used was purposive sampling, which is the selection of respondents based on certain criteria relevant to the research objectives, namely teachers who are actively teaching and have used digital devices or platforms in learning activities and school administration. Based on these criteria, 179 respondents were obtained who were considered to meet the minimum sample size for PLS analysis (referring to the rule of thumb, which is a minimum of 10 times the maximum number of paths to a construct).

Data collection procedures were carried out through the distribution of online and offline questionnaires. Online questionnaires were distributed using a digital survey platform, while offline questionnaires were distributed directly to several schools in coordination with the school principals. The research instruments were developed based on relevant theories and conceptual models from previous studies. The Digital Leadership variable was adapted from a digital leadership model that emphasises the ability of school leaders to lead technology-based change, inspire teachers, and facilitate digital innovation. The Digital Literacy Competence variable was compiled based on the Digital Competence Framework for Educators (DigCompEdu) framework, which includes teachers' technical, collaborative, and reflective abilities in using digital technology. Meanwhile, the Teacher Performance variable is measured through the dimensions of professionalism, learning effectiveness, pedagogical innovation, and contribution to improving student quality. Each construct is measured with a minimum of six indicators using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to ensure the reliability and validity of the construct.

The validity and reliability of the instrument were tested through several stages. Internal reliability testing was conducted using Cronbach's Alpha and Composite Reliability (CR) with a minimum threshold of 0.70, while convergent validity was tested using Average

Variance Extracted (AVE) with a minimum threshold of 0.50. Discriminant validity testing was conducted using the Fornell-Larcker criteria and HTMT ratio to ensure that each construct was conceptually distinct from the other constructs. Furthermore, data analysis was performed using SmartPLS version 4 software. The analysis stages consisted of two main parts, namely the outer model to test the validity and reliability of the constructs, and the inner model to analyse the structural relationships between variables. Significance testing was performed through the bootstrapping procedure, with significance criteria of t-statistic > 1.96 or p-value < 0.05 .

The addition of these methodological details enhances the transparency and credibility of the study, ensuring that each stage of the research can be scientifically replicated. Thus, this research method not only meets empirical standards in PLS-SEM-based quantitative research, but also ensures that the results obtained have a strong and reliable methodological basis.

FINDINGS AND DISCUSSION

The results of the Partial Least Square (PLS) analysis show a strong and well-constructed structural model. The constructs of Digital Leadership, Digital Literacy Competence, and Teacher Performance show indicators with factor loading values above 0.70, indicating that each indicator has good convergent validity in representing its construct. The Digital Leadership variable has a loading value between 0.714–0.838, Digital Literacy between 0.710–0.805, and Teacher Performance between 0.744–0.876. This means that this research instrument is reliable and accurate in measuring the intended concepts. The R-square value shows that Digital Leadership is able to explain 49% of the variance in Digital Literacy Competence, and together with Digital Literacy, it is able to explain 80.1% of the variance in Teacher Performance. This figure is relatively high and describes a substantial model.

Structurally, the estimation results show that Digital Leadership has a strong influence on Digital Literacy Competence with a path coefficient of 0.700. This indicates that the digital leadership style applied by school principals, including the ability to adapt to technology, digital-based communication, and teacher empowerment through digital platforms, plays a major role in improving teachers' digital literacy competence. Furthermore, Digital Literacy Competence has a positive and significant effect on Teacher Performance with a coefficient value of 0.636. This explains that the higher the ability of teachers to utilise digital technology for learning, administration, and professional collaboration, the better their performance will be. In the context of digital education transformation, digitally literate teachers are not only able to master technology, but also use it reflectively and creatively to improve learning effectiveness.

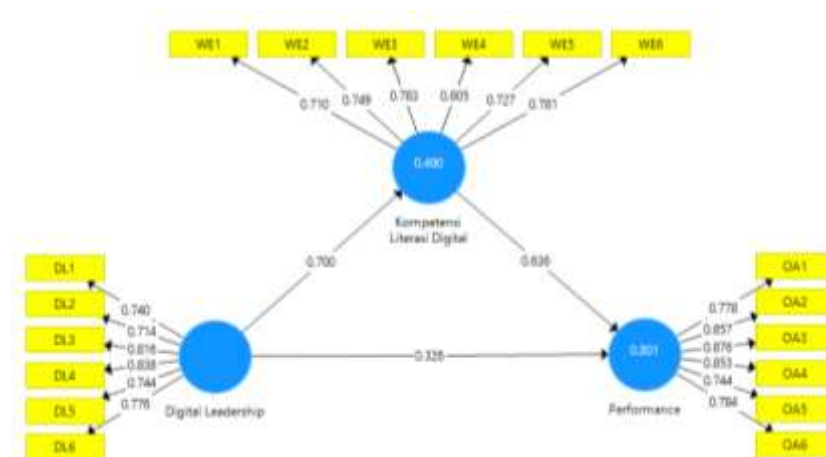


Figure 1. PLS Algorithm

An interesting finding was also observed in the direct relationship between Digital Leadership and Teacher Performance, which had a path coefficient of 0.326. This value indicates that digital leadership does have a direct impact on performance, but its influence is relatively smaller than the indirect effect through Digital Literacy. The calculation results

showed an indirect effect of 0.445, bringing the total effect of Digital Leadership on Teacher Performance to 0.771. Thus, it can be concluded that Digital Literacy Competence acts as a dominant partial mediating variable, where most of the influence of digital leadership on teacher performance flows through the improvement of digital competence. This means that the success of digital leadership is not only in terms of instruction and policy, but must also be realised through the improvement of teachers' digital skills in the field.

Based on the results of the Discriminant Validity test presented in the table, it can be concluded that all constructs in this research model have met the criteria for good discriminant validity. The diagonal values, which are the square roots of the Average Variance Extracted (AVE) for each variable – namely Digital Leadership (0.893), Digital Literacy Competencies (0.885), Organisational Agility (0.887), Performance (0.893), and Work Engagement (0.876) – are all higher than the correlations between other constructs in the same column and row. This indicates that each latent variable has a strong ability to explain its own indicators compared to other constructs, so that there is no concept overlap or multicollinearity between variables. Furthermore, the relationships between constructs that show moderate correlation values (ranging from 0.616 to 0.750) indicate a logical relationship between variables that remain conceptually separate. Thus, these results reinforce the evidence that each construct has adequate measurement uniqueness and is able to distinguish itself from other constructs in the research model, so that the conceptual model developed can be said to have a high level of clarity and measurement accuracy to proceed to the structural analysis stage.

Table 1. Discriminant Validity

	Digital Leadership	Digital Literacy Competencies	Organizational Agility	Performance	Work Engagement
Digital Leadership	0.893				
Digital Literacy Competencies	0.699	0.885			
Organizational Agility	0.750	0.700	0.887		
Performance	0.620	0.709	0.591	0.893	
Work Engagement	0.699	0.616	0.637	0.619	0.876

Based on the results of Construct Reliability and Validity analysis, all variables in this study showed excellent reliability and validity levels. The Cronbach's Alpha values for each construct – Digital Leadership (0.864), Digital Literacy Competence (0.854), and Performance (0.899) – are all above the threshold of 0.70, indicating that the indicators in each variable have high internal consistency. Furthermore, the Composite Reliability (CR) values also show very satisfactory results, namely 0.899 for Digital Leadership, 0.891 for Digital Literacy Competence, and 0.923 for Performance, which means that all constructs have strong and stable composite reliability in measuring the intended concepts. Meanwhile, the Average Variance Extracted (AVE) value for the three constructs was above 0.50 (0.597, 0.578, and 0.667, respectively), indicating that each latent variable was able to explain more than 50% of the variance of its indicators, so that convergent validity was well accepted. Thus, all constructs in this research model can be declared reliable and statistically valid, meaning that the measurement model is suitable for use in further structural analysis to test the relationships between the variables under study.

Table 2. Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Digital Leadership	0.864	0.867	0.899	0.597
Kompetensi Literasi Digital	0.854	0.859	0.891	0.578
Performance	0.899	0.900	0.923	0.667

Based on the results of the Construct Reliability and Validity test, it can be concluded that all constructs in this research model show excellent reliability and validity levels and meet the statistical criteria recommended for Partial Least Squares (PLS)-based measurement models. The Cronbach's Alpha values for the three main variables – Digital Leadership

(0.864), Digital Literacy Competence (0.854), and Performance (0.899) – are all above the threshold value of 0.70, indicating that each construct has high internal consistency and that the indicators are strongly correlated in measuring the same concept. The rho_A values ranging from 0.859 to 0.900 also indicate good measurement stability and reinforce the reliability of the constructs. Furthermore, the Composite Reliability (CR) values range from 0.891 to 0.923, well above the minimum threshold of 0.70, indicating that the overall construct has very strong composite reliability and is suitable for further analysis. Meanwhile, the Average Variance Extracted (AVE) values for each construct—Digital Leadership (0.597), Digital Literacy Competence (0.578), and Performance (0.667)—all exceeded the minimum threshold of 0.50, indicating that the relevant latent variables could explain more than 50% of the indicator variance. Thus, these results confirm that the measurement model in this study is valid, reliable, and representative in explaining the relationships between variables, so that it can be trusted for use in the next stage of structural model testing and inferential analysis.

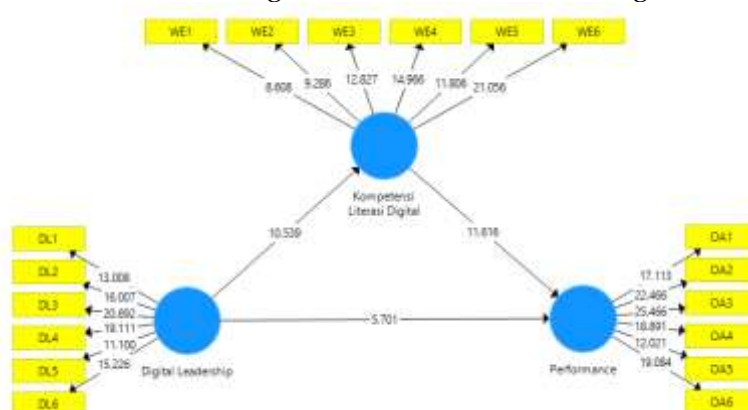


Figure 2. Bootstrapping Test

Based on the bootstrapping results shown in the figure, this analysis provides strong confirmation of the structural model. The t-statistic results show that all structural paths and reflective indicators are well above the threshold of 1.96 (at a significance level of 5%), so it can be concluded that all relationships between variables are statistically significant. In other words, both the relationships between the indicators and the constructs and the relationships between the main constructs (Digital Leadership, Digital Literacy Competence, and Teacher Performance/Performance) all have high and significant relationship strengths, confirming that this research model is empirically valid and robust.

When viewed from the perspective of inter-construct relationships, the path from Digital Leadership to Digital Literacy Competence has a t-statistic value of 10.539, far exceeding the significance threshold. This means that the digital leadership applied by school principals has a real and strong influence on improving teachers' digital literacy competence. In the context of junior high school education in Pangkalpinang, this shows that digital-based leadership – such as the ability of school principals to guide teachers in using technology, innovating in online learning, and utilising digital data for learning evaluation – truly has an impact on teachers' digital capabilities. Teachers under leaders with a clear digital vision will be encouraged to be more adaptive, exploratory, and confident in using technology in their professional activities.

Furthermore, the relationship between Digital Literacy Competence and Teacher Performance also shows high significance with a t-statistic value of 11.616. This value confirms that digital literacy is an important factor that bridges the improvement of teacher performance in the era of digital education. Teachers with high digital literacy are not only able to use learning devices and applications, but also understand the pedagogical context and digital ethics, are able to collaborate in virtual spaces, and can adjust learning strategies according to the needs of students in the digital era. With these abilities, teachers become more productive, innovative, and have measurable performance results, both in terms of professionalism, creativity, and the quality of student learning outcomes.

Furthermore, the direct path between Digital Leadership and Teacher Performance is also significant with a t-statistic value of 5.701. This value confirms that, in addition to digital literacy, digital leadership also has a direct influence on teacher performance. This illustrates that the role of the headteacher is not limited to providing technical guidance, but also as a role model, motivator, and facilitator for teachers in facing technology-based educational changes. Digital leaders who are able to foster a collaborative work culture, are open to innovation, and support teacher self-development will encourage continuous performance improvement. However, because the indirect effect through digital literacy is stronger, it can be said that the main influence of digital leadership on teacher performance is largely mediated by digital literacy competencies.

The bootstrapping results for the construct indicators also reinforces this finding. All indicators for the Digital Leadership variable have t-statistics values above 10, indicating that each indicator significantly reflects its construct. The highest indicators are found in DL3 ($t = 20.892$) and DL4 ($t = 19.111$), indicating that the aspects of the ability to lead digital change and inspire technology are the strongest dimensions in describing digital leadership in schools. In the Digital Literacy Competence variable, indicators WE4 and WE6 stand out with t-statistics values above 14, indicating the importance of the aspects of digital collaboration skills and the ability to adapt to new technologies. Meanwhile, in the Teacher Performance variable, indicators OA3 and OA4 have the highest t-statistics values above 25, indicating that the aspects of productivity and innovation in digital learning are the strongest representations of teacher performance in the era of educational transformation.

The results of this bootstrapping test reinforce the conclusion that the research model is significant overall and has a strong relationship between variables. Digital leadership has been proven to play an important role in improving teacher performance, both directly and through increased digital literacy. Thus, strategies to improve the quality of education in Pangkalpinang need to be directed at strengthening the digital leadership capacity of school principals and empowering teachers through continuous digital literacy training. These results also convey a strategic message that digital education transformation is not merely about technology, but about how leaders and teachers can adapt and collaborate digitally to create a relevant, inspiring, and productive learning environment in the new era of education.

The bootstrapping test results obtained from this research model provide significant reinforcement of the relationship between the variables studied, namely Digital Leadership, Digital Literacy Competence, and Teacher Performance in Pangkalpinang. Theoretically, these results reinforce the relevance of transformational leadership theory and digital adaptation theory in the context of modern education. Digital leadership does not only focus on technological mastery, but also on the ability of educational leaders to create a shared vision, drive change, and foster a culture of technology-based innovation. High t-statistics values (more than 5.701 on the direct path and 10.539 and 11.616 on the indirect paths) indicate that these variables systematically reinforce each other. This means that the theory stating that digital leadership can influence teacher performance through increased digital literacy is not merely a conceptual assumption but has been empirically proven in regional educational contexts such as Pangkalpinang.

Table 3. Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Digital Leadership -> Kompetensi Literasi Digital	0.700	0.701	0.066	10.539	0.000
Digital Leadership -> Performance	0.326	0.324	0.057	5.701	0.000
Kompetensi Literasi Digital -> Performance	0.636	0.638	0.055	11.616	0.000
Digital Leadership -> Kompetensi Literasi Digital -> Performance	0.445	0.447	0.056	7.945	0.000

Based on the results of the Path Coefficients analysis, it can be concluded that all relationships between variables in this research model show a positive and significant influence, both directly and indirectly. First, the Digital Leadership → Digital Literacy Competence path has a coefficient value of 0.700 with a t-statistic value of 10.539 and a p-value of 0.000, which means that the influence is very significant. This shows that the higher the digital leadership skills possessed by teachers, the higher their digital literacy competencies. Good digital leadership encourages teachers to become accustomed to using technology, adapt to digital platforms, and develop digital literacy skills that support learning.

Second, the relationship between Digital Leadership → Performance also shows a significant positive influence with a coefficient of 0.326, t-statistic of 5.701, and p-value of 0.000. This means that teachers who have high digital leadership skills tend to perform better in terms of professionalism, learning innovation, and effectiveness in the use of educational technology. Third, the Digital Literacy Competence → Performance pathway shows a very strong coefficient of 0.636 with a t-statistic of 11.616 and a p-value of 0.000. This indicates that digital literacy is an important factor that directly contributes to improving teacher performance, as this skill helps teachers optimise the learning process and improve student learning outcomes.

In addition, the results of the Digital Leadership → Digital Literacy Competence → Performance pathway with a coefficient of 0.445, t-statistic of 7.945, and p-value of 0.000 indicate a significant mediating effect of Digital Literacy Competence. This means that part of the effect of digital leadership on teacher performance is channelled through increased digital literacy. In other words, effective digital leadership not only has a direct impact on performance, but also strengthens teacher performance by improving their ability to manage and apply technology creatively. Overall, these results confirm that the research model has a strong and relevant structural relationship, and supports the hypothesis that digital literacy competency acts as a mediator that strengthens the relationship between digital leadership and teacher performance in the era of digital education transformation.

Theoretically, the strong relationship between Digital Leadership and Digital Literacy Competence ($t = 10.539$) supports the conceptual model developed by Avolio & Kahai (2013) regarding e-leadership, which emphasises that effective leaders in the digital era are those who are able to integrate technology into leadership strategies and decision-making. In the context of secondary school teachers, headteachers who apply the principles of digital leadership will encourage teachers to be more active in adopting educational technology innovations, developing digital pedagogical skills, and expanding their digital literacy horizons. Empirically, these results show that when headteachers act as digital facilitators and inspirers, teachers will be better prepared to face the increasingly complex demands of technology-based learning.

The significant results of the relationship between Digital Literacy Competence and Teacher Performance ($t = 11.616$) also reinforce the Technology Acceptance Model (TAM) theory and the Digital Competence Framework (DigComp) theory, which emphasise the importance of individual abilities in understanding, using, and creating digital content critically. Digital literacy is not merely a technical skill, but also includes critical thinking, collaboration, communication, and digital security skills. In the context of secondary school teachers, these abilities are key assets in improving the effectiveness of the learning process, both online and face-to-face. Therefore, theoretically, these findings broaden the understanding that digital literacy is a key variable linking digital leadership to teachers' professional performance in the era of educational transformation.

From a practical perspective, the results of this study confirm that Digital Leadership has a direct and indirect influence on Teacher Performance, with a partial mediating effect through Digital Literacy Competence. This means that improving teacher performance cannot be achieved solely by strengthening the headteacher's managerial system, but must be accompanied by systematic efforts to develop teachers' digital skills. Headteachers need to be digital role models – not only using technology for administration, but also motivating,

guiding, and creating an innovative climate that allows teachers to experiment with learning technologies. Programmes such as digital mentoring, peer learning, and school-based digital innovation can be implementative strategies that strengthen the relationship between digital leadership and improved teacher performance.

The policy implications of this research are quite strategic for decision makers in the field of education, especially at the local government level. The results of the study show that digital literacy competencies serve as a key bridge between leadership and teacher performance. Therefore, the Pangkalpinang City Education Office needs to formulate a continuous training policy that not only focuses on technical skills but also builds a digital culture in schools. The principal development programme should also be directed towards strengthening the dimensions of digital leadership, which include strategic thinking, digital communication, and data-based change management. In this way, digital transformation in the education sector can be more holistic and sustainable.

From a social and institutional perspective, these findings show that schools with strong digital leadership will be more adaptive to technological disruption. Digitally competent teachers will have greater confidence in facing the challenges of distance learning, using Learning Management Systems (LMS), and artificial intelligence-based innovations in the classroom. This condition will ultimately strengthen the competitiveness of educational institutions in areas such as Pangkalpinang, making schools not just places for knowledge transfer, but also centres of digital innovation that produce students with 21st-century skills. Thus, the results of this study indicate that digital literacy should be a key indicator in assessing the performance of educational institutions in the future.

Overall, the findings of this study make an important contribution to the development of digital education leadership theory and practice in Indonesia. The strong and significant relationship between variables shows that the success of digital education transformation is not only determined by central government policy, but also by the leadership capacity at the school level in developing teachers' digital competencies. Therefore, the results of this study can serve as a basis for the development of a literacy-based digital leadership model that can be applied at various levels of education. With an integrated approach between visionary leadership, digital competence, and professional performance, the Indonesian education sector will be better prepared to face the demands of the digital revolution and create a smart, adaptive, and sustainable education system.

CONCLUSIONS

Overall, the results of this study indicate that Digital Leadership has a positive and significant effect on Teacher Performance, both directly and indirectly through Digital Literacy Competence as a dominant partial mediating variable. Digital Leadership enhances teachers' ability to use and interpret digital technology, ultimately improving effectiveness, creativity, and professionalism in learning implementation. Digital Literacy Competence serves as a crucial strategic link that transforms digital leadership capacity into measurable and sustainable performance within the context of technology-based education. Theoretically, this study contributes to the development of digital leadership theory in education by demonstrating that digital leadership is not merely a technical skill but also encompasses the ability to build a collaborative, innovative, and adaptive culture at the institutional level. These findings strengthen the understanding that digital literacy is an essential competency mediating the success of digital leadership in enhancing teachers' professional performance. Practically, the results provide a basis for policymakers, such as the Education Office and schools, to design sustainable digital leadership training and digital literacy development programs through mentoring, learning innovation workshops, and the establishment of a supportive technological ecosystem. However, this study is limited by its quantitative approach and reliance on respondents' perceptions, which may not capture the dynamics of leadership processes and digital literacy practices in depth. Future research should integrate qualitative methods, such as in-depth interviews or classroom observations, and expand the

research context to various educational levels – primary, secondary, and higher education – to generalize findings more comprehensively. With digitally visionary leaders and teachers who are competent in digital literacy, the education system will be better prepared to respond to challenges and leverage opportunities in the era of ongoing digital transformation.

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