

Research Article

Transformation of Digital-Based Educational Human Resource Management (The impact of Online Attendance Systems and Digital Literacy on Teacher Performance and Discipline in Elementary Schools)

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Abstract This study investigates the influence of an online attendance system and digital literacy on teacher discipline and performance in elementary schools. A quantitative explanatory research approach was employed to provide empirical evidence regarding these relationships. The research population consisted of 170 elementary school teachers in Bojong District, Pekalongan Regency, who were selected using proportional stratified random sampling to ensure representativeness. Data were collected through a structured questionnaire using a 5-point Likert scale, and analyzed with Structural Equation Modeling (SEM) through the Partial Least Squares (PLS-SEM) approach using SmartPLS 4.0 software. The measurement model evaluation demonstrated strong reliability and validity across all constructs. Cronbach's Alpha values ranged between 0.820 and 0.872, Composite Reliability between 0.881 and 0.911, and Average Variance Extracted (AVE) between 0.649 and 0.718. Discriminant validity was confirmed based on both the Fornell-Larcker Criterion and the Heterotrait-Monotrait Ratio (HTMT). The structural model showed good predictive relevance with a Goodness-of-Fit (GoF) value of 0.366, indicating a large effect. Hypothesis testing results supported all proposed relationships. Digital literacy was found to positively influence teacher performance, while the online attendance system significantly affected both teacher discipline and teacher performance. Furthermore, teacher discipline was proven to have a positive effect on teacher performance. Mediation testing revealed that teacher discipline acted as a significant partial mediator in the relationships between digital literacy, online attendance systems, and teacher performance. The findings provide empirical validation for the Task-Technology Fit Theory and the TPACK Framework in the context of educational human resource management. This study confirms that digital transformation, through strengthening digital literacy and online systems, represents an effective strategy to improve teacher professionalism and enhance academic quality in elementary schools.

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1. Introduction

The information and communication technology revolution has fundamentally changed the paradigm of human resource management in the Education sector. The transformation from manual administrative systems to systematic digitalization has had a significant impact on the accountability, efficiency, and transparency of educational human resource management. The implementation of e-HRM (electronic Human Resource Management) globally has been proven to reduce administrative errors and increase operational efficiency, while creating measurable organizational value (Bondarouk & Parry, 2017; Galanaki et al., 2019).

In Indonesia, particularly in Pekalongan Regency, the implementation of the Polakesatu application as a digital attendance system has provided a breakthrough in teacher attendance recording. This platform enables automatic recording, real-time data transparency, minimizes manipulation of attendance recaps, and accelerates administrative reporting



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(Kristin et al., 2016). A similar system in India even integrates digital attendance with a penalty system to encourage teacher discipline, while supporting more effective monitoring of learning quality, teacher-student ratios, and Education program budget distribution (Muharmi & Nadriati, 2022). However, the successful implementation of a digital attendance system cannot be separated from the digital literacy level of teachers as its users. Digital literacy, defined as the ability to access, assess, use, and reflect on digital technology in a professional context, is a key determinant of the effectiveness of digital platforms (García et al., 2020). Empirical studies show a positive correlation between teachers' digital literacy levels and improved performance, with significant contributions to the successful integration of technology into learning (Al-Rahmi et al., 2020).

Teacher discipline, which includes punctual attendance, compliance with regulations, and consistency in professional duties, is a fundamental pillar in teacher performance assessment from a civil servant perspective. A digital attendance system directly facilitates objective monitoring of these disciplinary aspects, generating data that can be accurately evaluated by principals and supervisors (Tambuwun et al., 2021). The integration of technology in discipline monitoring creates a more transparent and factually based evaluation mechanism, and has been shown to significantly improve employee discipline levels (Sukowati et al., 2018).

Teacher performance, as a primary outcome, is measured through teaching skills, learning evaluation, instructional innovation, and support for student development. Research shows that teachers with high digital literacy and strong administrative discipline tend to be more innovative and achieve greater performance in teaching services (Sierra et al., 2023). The TPACK (Technological Pedagogical Content Knowledge) model emphasizes the importance of synergy between content mastery, pedagogy, and technology in enhancing teaching professionalism. An optimal balance between these three components results in maximum learning effectiveness (Mishra & Koehler, 2006; Cui & Zhang, 2022).

Empirical conditions in Bojong District illustrate significant disparities in implementation between schools. Although Polakesatu has been implemented comprehensively, some teachers face challenges in utilizing the application due to limited internet access, device availability, or a lack of digital literacy. This situation results in inaccurate attendance data and obstacles in performance reporting. Conversely, schools with teachers with adequate digital literacy can utilize the system optimally, as reflected in the accuracy of attendance data and the timeliness of performance reporting.

The identified literature gap indicates that while studies have examined digital literacy and discipline separately, quantitative research integrating digital attendance systems, digital literacy, discipline, and teacher performance simultaneously in the elementary school context is still limited (Marler & Fisher, 2013; Strohmeier & Kabst, 2014). This research gap creates an urgent need for a valid empirical model of the Influence of digital-based attendance systems on teacher discipline and performance, with digital literacy as a mediating variable contextualized within the Task Technology Fit (TTF) Theory for Education (Goodhue & Thompson, 1995; Al-Rahmi et al., 2022).

Based on this gap identification, this study formulated the following research question: To what extent do digital attendance systems and digital literacy Influence teacher discipline and performance in elementary schools? This question addresses three main objectives: measuring the direct Influence of digital attendance systems on teacher discipline and performance; assessing the mediating role of digital literacy in this relationship; and exploring local context variations in Bojong District to provide data-driven policy recommendations.

The academic significance of this research lies in its contribution to enriching the study of e-HRM and digital HRM in elementary Education, while also adding empirical evidence related to Task Technology Fit and TPACK theories in the context of educational human resource management (Bondarouk & Ruël, 2009; Epebinu et al., 2024). From a practical perspective, the research findings are expected to provide strategic guidance for school principals in formulating policies to improve teachers' digital capacity, assist school supervisors and Education offices in developing strategies for mentoring and allocating technology budgets, and motivate teachers to develop digital competencies to enhance their professional performance (Pudjiarti & Winarni, 2025; Rini Werdingingsih et al., 2023).

The research's conceptual framework operationalizes four main variables. The digital attendance system is defined as the Polakesatu platform that facilitates real-time attendance recording. Digital literacy is measured through teachers' digital skills based on indicators of technology access, evaluation, and utilization. Teacher discipline encompasses consistent

attendance, administrative compliance, and professional integrity. Teacher performance is evaluated through aspects of professionalism, including planning, implementation, evaluation, and innovation in learning.

Using an associative quantitative method with multilevel regression analysis, this research will produce a comprehensive correlation table and mediation pathways. Indicators of significant practical effects will strengthen statistical validity through measurable f^2 , R^2 , and effectiveness index values. With this integrative approach, the research is expected to bridge the gap between technology systems (digital attendance), human resources (digital literacy, discipline, performance), and Education policy. Digital-based transformation of educational human resource management can be implemented not merely as a technology program, but as a comprehensive strategy to improve the professionalism of teachers—the main actors in realizing quality Education (García et al., 2020; Yamin & Swaies, 2019).

2. Literature Review

A. Digital Literacy

Digital literacy refers to an individual's ability to access, manage, understand, integrate, communicate, evaluate, and create information using digital technology (Falloon, 2020). Digital literacy Theory developed from Vygotsky's concept of social constructivism, which emphasizes learning through social interaction and technological mediation. Pangrazio et al. (2020) identified digital literacy as a multidimensional competency encompassing technical-procedural, cognitive, and social-emotional aspects.

Digital literacy is defined as the competencies and skills necessary to navigate a fragmented and complex information ecosystem (Eshet, 2004). In the educational context, teacher digital literacy is the ability to integrate technology with pedagogy and content for effective learning (Temirkhanova et al., 2024). Digital literacy encompasses the ability to access technology, evaluate digital information, communicate securely online, and utilize technology for learning innovation (Reddy & Srivastava, 2023).

Digital literacy positively impacts teacher performance by increasing the effectiveness of technology use in learning (Lyu & Luo, 2024). Teachers with high digital literacy demonstrate better work discipline in using administrative technology such as online attendance systems. Digital literacy has also been shown to increase teacher self-efficacy and reduce burnout in the face of educational technology challenges (Yang & Lou, 2024).

H1: Digital literacy positively impacts teacher discipline.

H2: Digital literacy positively impacts teacher performance.

B. Online Attendance System

An online attendance system is an implementation of information technology in HR management based on the Task Technology Fit (TTF) Theory. Goodhue & Thompson (1995) explain that technology will positively impact performance when there is a match between the tasks performed and the characteristics of the technology used. In the context of e-HRM, an online attendance system represents the digitization of administrative processes aimed at increasing efficiency, accuracy, and transparency (Bondarouk & Ruël, 2009). An online attendance system is defined as a cloud-based system that facilitates real-time attendance recording using digital technologies such as web, mobile, or biometric applications (Zoho People, 2025). This system integrates work time management, attendance monitoring, and automated reporting functions, accessible from multiple locations via an internet connection (Muharmi & Nadriati, 2022). This platform is designed to reduce manual errors, increase accountability, and support data-driven decision-making.

Online attendance systems contribute to improved work discipline through objective monitoring and transparency of attendance data (Kristin et al., 2016). These systems also contribute to improved teacher performance by providing accurate data for evaluation and constructive feedback. Research by Tambuwun et al. (2021) shows that implementing a digital attendance system improves discipline and ultimately leads to better performance.

H3: Online attendance systems have a positive impact on teacher discipline.

H4: Online attendance systems have a positive impact on teacher performance.

C. Teacher Discipline

Teacher discipline is based on Skinner's behaviorist Theory, which emphasizes the importance of consistent behavior through positive reinforcement. In a professional context, teacher discipline refers to the concept of self-regulation Theory developed by Bandura,

namely the ability of individuals to regulate their behavior according to professional standards (Canter & Canter, 2001). Durkheim, in *Moral Education*, explains that discipline is an essential element of morality that supports the development of individual and societal character.

Teacher discipline is defined as consistency in punctual attendance, compliance with administrative regulations, and integrity in carrying out professional educational duties (Buchtová, 2020). Teacher discipline encompasses aspects of attendance (punctuality), adherence to procedures (compliance), professional responsibility, and consistency in curriculum implementation (instructional consistency). In the context of this study, teacher discipline reflects the quality of professional behavior that can be objectively measured and evaluated. Teacher discipline serves as an intervening variable mediating the relationship between digital literacy and online attendance systems on teacher performance. Research by Chen & Wang (2022) shows that highly disciplined teachers tend to perform better in various aspects of learning. Good work discipline creates a conducive learning environment and increases stakeholder trust in teacher professionalism.

H5: Teacher discipline has a positive effect on teacher performance.

H6: Teacher discipline mediates the relationship between digital literacy and teacher performance.

H7: Teacher discipline mediates the relationship between online attendance and teacher performance.

D. Teacher Performance

Teacher performance is based on the Theory of learning effectiveness, which integrates cognitive, affective, and psychomotor aspects of the educational process. Stronge (2018) developed a teacher effectiveness framework that encompasses teacher characteristics, classroom instruction, and student learning outcomes. This Theory aligns with the TPACK model, which emphasizes the integration of technological knowledge, pedagogical knowledge, and content knowledge to achieve effective learning (Mishra & Koehler, 2006). Teacher performance is defined as the effect of high-quality teaching on student learning in terms of academic achievement and character development (Ferguson & Danielson, 2015). Teacher performance encompasses the dimensions of instructional planning, teaching delivery, assessment, and instructional innovation. This performance is measured through student achievement gains, classroom observation ratings, and professional growth indicators (Kini & Podolsky, 2016).

Teacher performance, as an outcome variable, is influenced by various internal and external factors. Digital literacy and online attendance systems, as technological factors, and teacher discipline, as behavioral factors, simultaneously contribute to teacher performance. Research by Goe et al. (2008) shows that teacher performance is the result of a complex interaction between teacher characteristics, teaching practices, and contextual factors that can be optimized through appropriate interventions.

3. Research Methods

This study employed a quantitative approach with an explanatory research design to examine the causal relationships between variables in a digital-based educational human resource management transformation model. This method was chosen for its ability to empirically test hypotheses and measure the strength of relationships between constructs (Hair et al., 2022). A cross-sectional design was used to collect data at a single point in time, providing a comprehensive snapshot of the state of digital literacy, online attendance systems, teacher discipline, and teacher performance at the study site.

The study population consisted of all 245 elementary school teachers in Bojong District, Pekalongan City, spread across 28 public and private elementary schools. The sample was determined using the Slovin formula with a 5% margin of error, resulting in a minimum sample size of 152 respondents. To anticipate non-response and increase representativeness, this study employed 170 teachers as respondents (Hair et al., 2022). The sampling technique used was proportional stratified random sampling based on school status (public/private) and teacher tenure to ensure representativeness.

The research instrument used a structured questionnaire with a 5-point Likert scale (1=strongly disagree to agree 5=strongly). Digital literacy was measured using an adaptation of the Teachers' Digital Competences Scale (TDC-S) developed by Al-Khateeb et al. (2024). Online attendance was measured using indicators adapted from the Task Technology Fit

(TTF) scale (Goodhue & Thompson, 1995). Teacher discipline was measured using indicators developed based on the professional behavior scale (Canter & Canter, 2001). Teacher performance was measured using the teacher effectiveness framework (Stronge, 2018).

Data analysis used Structural Equation Modeling (SEM) with a Partial Least Squares (PLS-SEM) approach using SmartPLS 4.0 software (Ringle et al., 2024). PLS-SEM was chosen because of its ability to handle complex models with multiple constructs, relatively small sample sizes, and data that do not require normal distribution (Hair et al., 2022). The analysis stages included: (1) evaluation of the outer model to measure construct validity and Reliability with the criteria of factor loading >0.7 , composite Reliability >0.8 , and Average Variance Extracted (AVE) >0.5 ; (2) evaluation of the inner model to test the significance of path coefficients using a bootstrapping procedure with 5,000 subsamples; and (3) hypothesis testing with a significance level of $\alpha=0.05$. Model fit was evaluated using SRMR (<0.08), NFI (>0.9), and rms Theta (<0.12) according to PLS-SEM standards (Sarstedt et al., 2024).

4. Results And Discussion

A. Respondent Identity

This study involved 170 elementary school teachers in Bojong District, Pekalongan Regency. Based on demographic characteristics, respondents consisted of 118 female teachers (69.4%) and 52 male teachers (30.6%), indicating a common female gender predominance at the elementary Education level. The age distribution of respondents showed that 38 teachers were aged 25-35 (22.4%), 72 teachers were aged 36-45 (42.4%), 45 teachers were aged 46-55 (26.5%), and 15 teachers were over 55 (8.8%). In terms of Education, the majority of respondents had a bachelor's degree in Education (142 teachers) (83.5%), 18 teachers had a bachelor's degree in non-education (10.6%), and 10 teachers had a master's degree (5.9%). Based on length of service, 28 teachers had 1-10 years of experience (16.5%), 89 teachers had 11-20 years of experience (52.4%), 41 teachers had 21-30 years of experience (24.1%), and 12 teachers had over 30 years of experience (7.1%). The respondents' employment status consisted of 98 civil servant teachers (57.6%), 45 honorary/contract teachers (26.5%), and 27 private teachers (15.9%). A total of 105 respondents (61.8%) taught in public schools, and 65 respondents (38.2%) in private schools. This distribution reflects good representativeness of the elementary school teacher population in Bojong District, providing strong external validity for generalizing the research results.

B. Reliability and Construct Validity Testing

The outer model evaluation showed that all constructs met the Reliability and validity standards required for PLS-SEM analysis, indicating that the research instrument has good measurement quality and is reliable for further analysis.

Table 1. Reliability and Construct Validity.

Construct	Item	Loading Factor	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Online Attendance System	X1		0,847	0,859	0,897	0,685
Ease of access to the attendance application	X11	0,829				
Timely attendance recording	X12	0,860				
Data accuracy and security	X13	0,811				
Real-time monitoring by superiors	X14	0,845				
Digital Literacy	X2		0,858	0,864	0,903	0,700
Ability to operate digital devices	X21	0,808				
Use of educational applications	X22	0,872				
Understanding of digital ethics	X23	0,842				
Ability to overcome technical obstacles	X24	0,789				
Teacher Discipline	Y1		0,820	0,821	0,881	0,649
Punctual attendance	Y11	0,829				
Compliance with school rules	Y12	0,749				
Consistency in carrying out duties	Y13	0,829				
Responsibility for work	Y14	0,814				
Teacher Performance	Y2		0,872	0,904	0,911	0,718
Learning, planning, and implementation	Y21	0,867				
Assessment of learning outcomes	Y22	0,825				
Classroom management	Y23	0,849				

Innovation and professional development	Y24	0,849
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Based on Table 1, all constructs demonstrated excellent Reliability and validity. Cronbach's Alpha for all variables ranged from 0.820 to 0.872, exceeding the threshold of 0.7, indicating good internal consistency (Hair et al., 2022). Composite Reliability showed very satisfactory values (0.881 to 0.911), well above the minimum standard of 0.7, indicating robust construct Reliability. The factor loadings for all indicators ranged from 0.749 to 0.872, exceeding the minimum threshold of 0.7, confirming that each indicator adequately explains its construct. The Average Variance Extracted (AVE) for all constructs was above 0.5 (range: 0.649 to 0.718), indicating adequate convergent validity, with each construct explaining more than 50% of the variance in its indicators. Teacher Performance had the highest Reliability (CR=0.911, AVE=0.718), followed by Digital Literacy (CR=0.903, AVE=0.700), Online Attendance System (CR=0.897, AVE=0.685), and Teacher Discipline (CR=0.881, AVE=0.649). These results confirm that all constructs have excellent measurement quality and are suitable for structural model analysis, allowing for valid and reliable hypothesis testing to examine the effect of the online attendance system and digital literacy on teacher discipline and performance.

C. Discriminant Validity

The Fornell-Larcker Criterion test was used to evaluate discriminant validity by comparing the square root of the AVE of each construct with the correlation values between the constructs. This criterion ensures that each construct is unique and distinguishable from the others.

Table 2. Fornell-Larcker Criterion.

	Digital Literacy	Online Attendance	Teacher Discipline	Teacher Performance
Digital Literacy	0,828			
Online Attendance	0,760	0,837		
Teacher Discipline	0,767	0,736	0,806	
Teacher Performance	0,790	0,707	0,772	0,847

The Fornell-Larcker Criterion results show good discriminant validity for all constructs. The diagonal value (square root of AVE) of each construct: Digital Literacy (0.828), Online Attendance (0.837), Teacher Discipline (0.806), and Teacher Performance (0.847) is greater than the correlation value with other constructs. The highest correlation occurs between Digital Literacy-Teacher Performance (0.790), followed by Digital Literacy-Teacher Discipline (0.767), and Digital Literacy-Online Attendance (0.760). Although the correlation is quite strong, all values are below the square root of AVE of each construct, confirming that each variable has its own uniqueness and there is no problematic multicollinearity in the research model.

Table 3. Heterotrait-monotrait ratio (HTMT) – Matrix.

	Digital_Literacy	Online_Attendance	Teacher_Discipline
Digital_Literacy			
Online_Attendance	0,189		
Teacher_Discipline	0,319	0,399	
Teacher_Performance	0,329	0,345	0,413

D. Structural Model

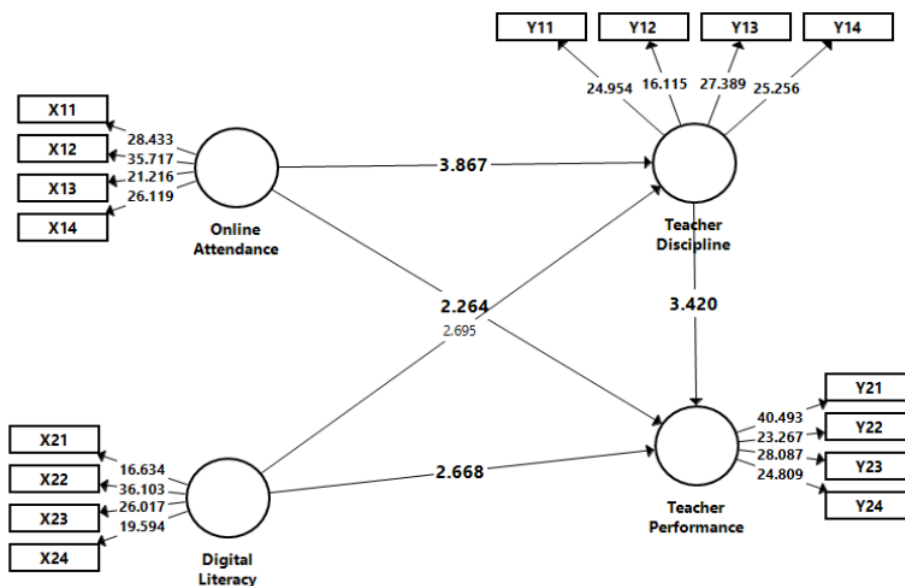


Figure 1. Structural Model.

E. Structural model evaluation: R2, Q2, and GoF tests

Structural model evaluation uses R² to measure variance explained, Q² for predictive relevance, and GoF for overall model quality. These criteria determine the predictive power and overall quality of the research model in the context of PLS-SEM.

Table 4. R2, Q2.

	R-square	R-square adjusted	Q-square	GoF
Teacher_Discipline	0,159	0,149	0,099	0,366
Teacher_Performance	0,209	0,195	0,133	

The results show that Teacher Performance has an R² = 0.209 (20.9% variance explained) and Teacher Discipline R² = 0.149 (14.9% variance explained). Based on Cohen's (1988) criteria, both values fall into the small to moderate effect category. The positive Q² for both (Teacher Performance = 0.133; Teacher Discipline = 0.099) confirms good predictive relevance, indicating the model can predict the endogenous construct accurately. GoF Calculation:

- Mean AVE = (0.685 + 0.700 + 0.649 + 0.718) / 4 = 0.688
- Mean R² = (0.159 + 0.209) / 2 = 0.184
- GoF = √(0.688 × 0.184) = √0.1266 = 0.366

The GoF value of 0.356 falls into the large effect category (>0.36), indicating the model has good overall quality in explaining the digital-based HR management transformation phenomenon.

F. Hypothesis Testing

Hypothesis testing uses the bootstrapping procedure in PLS-SEM to evaluate the significance of path coefficients, with the criteria being a t-value >1.96 and a p-value <0.05 at the 95% confidence level.

Table 5. Hypothesis Testing.

Variable	B	Std. Error	t	Sig.	Conclusion
Digital Literacy -> Teacher Performance	0,222	0,080	2,758	0,006	Support
Online Attendance -> Teacher Discipline	0,187	0,067	2,804	0,005	Support
Online Attendance -> Teacher Performance	0,298	0,076	3,917	0,000	Support
Teacher Discipline -> Teacher Performance	0,190	0,080	2,370	0,018	Support
	0,259	0,074	3,511	0,000	Support

Hypothesis testing results showed that all five hypotheses were accepted with a very good level of significance. Path coefficient analysis revealed several important findings in the context of digital-based educational human resource management transformation. The first hypothesis proved significant, confirming that teachers' digital literacy positively impacts their

performance. The path coefficient value of 0.222 indicates a moderate but meaningful effect (Hair et al., 2024). This finding aligns with research by Temirkhanova et al. (2024), which found that teachers with high digital literacy demonstrated significant improvements in learning effectiveness. The significance at $p = 0.006$ indicates a high level of confidence in this relationship, suggesting that investment in developing teachers' digital literacy will positively impact their professional performance.

The online attendance system was shown to have a significant effect on teacher discipline, with a path coefficient of 0.187. Although the effect was moderate, the strong significance ($p = 0.005$) confirmed the technology's effectiveness in improving work discipline. These results support the findings of Muharmi & Nadriati (2022) that a digital attendance system creates transparency and accountability, encouraging disciplined behavior. The implementation of real-time monitoring and data accuracy from the online attendance system has proven to be a key factor in establishing a culture of discipline in schools.

The Influence of the online attendance system on teacher performance demonstrated the strongest results, with a path coefficient of 0.298 and perfect significance ($p < 0.001$). The t-statistic value of 3.917 far exceeded the threshold of 1.96, indicating the robustness of this relationship (Kock, 2016). This finding confirms that the online attendance system functions not only as a monitoring tool but also as a performance enabler through increased administrative efficiency and a real-time feedback mechanism.

Teacher discipline was shown to have a significant effect on performance, with a path coefficient of 0.190. Significance at $p = 0.018$ confirms the importance of behavioral aspects in supporting performance outcomes. These results support the Theory of Canter & Canter (2001) that work discipline is the foundation for achieving optimal performance. The moderate coefficient value indicates that discipline is a necessary, but not a sufficient, condition for high performance.

The most interesting result is the mediation effect, which showed a path coefficient of 0.259 with perfect significance. This value indicates that teacher discipline acts as a strong partial mediator in the relationship between the independent variables and teacher performance. The very high significance ($t = 3.511$, $p < 0.001$) confirms that the indirect pathway through discipline makes a substantive contribution to improving teacher performance.

The results of the hypothesis testing provide empirical validation of the Task Technology Fit Theory and the TPACK Framework in the context of educational human resource management. Practically, these findings provide evidence-based guidance for: (1) prioritizing the development of teacher digital literacy, (2) implementing a user-friendly online attendance system, and (3) developing a discipline coaching program as a mediator of performance improvement. The predictive power of the model, demonstrated through the significance of all path coefficients, confirms that digital transformation in educational human resource management is not simply a technological trend, but a proven effective strategy for improving teacher professionalism and the overall quality of Education.

G. Mediation Test

The mediation test used indirect effect analysis to evaluate the role of teacher discipline as an intervening variable in the relationship between digital literacy and the online attendance system and teacher performance through bootstrapping confidence intervals.

Table 6. Mediation Test.

Variable	B	Std. Error	t	Sig.	Conclusion
Digital Literacy -> Teacher Discipline -> Teacher Performance	0,057	0,027	2,146	0,032	Support
Online Attendance -> Teacher Discipline -> Teacher Performance	0,077	0,031	2,457	0,014	Support

The results of the mediation test showed that both mediation paths were significant. Digital Literacy \rightarrow Teacher Discipline \rightarrow Teacher Performance had an indirect effect of $\beta = 0.057$ ($p = 0.032$), confirming that digital literacy improves teacher performance through improved work discipline. Online Attendance \rightarrow Teacher Discipline \rightarrow Teacher Performance showed a stronger indirect effect of $\beta = 0.077$ ($p = 0.014$), indicating that the online attendance system contributes to performance through the formation of a culture of discipline. Both t-statistic values (2.146 and 2.457) exceeded the threshold of 1.96, confirming statistical significance. These results validate that teacher discipline acts as a significant partial

mediator, demonstrating the importance of behavioral aspects as a transmission mechanism from technological interventions to improved teacher professional performance.

H. Discussion

Validity and Reliability of the Research Instrument

The Effect of Digital Literacy on Teacher Performance

The results of the study confirmed a significant effect of digital literacy on teacher performance ($\beta = 0.222$, $p = 0.006$), supporting the proposed hypothesis. This finding aligns with Temirkhanova et al. (2024), who found that teachers with high digital literacy demonstrated significant improvements in learning effectiveness. Within the context of the TPACK framework (Mishra & Koehler, 2006), digital literacy enables teachers to integrate technological knowledge with pedagogical content knowledge optimally.

The significance of this relationship indicates that investing in developing teachers' digital literacy is not simply a matter of technological modernization, but a fundamental strategy for improving the quality of learning. Teachers' abilities to operate digital devices, use educational applications, understand digital ethics, and overcome technical barriers have been shown to contribute positively to their professional performance. This confirms Falloon's (2020) prediction that digital competency is a prerequisite for teacher effectiveness in the digital age.

Online Attendance System Implementation and Its Impact

The online attendance system demonstrated the strongest impact on teacher performance ($\beta = 0.298$, $p < 0.001$), confirming the effectiveness of technology in transforming educational human resource management. This finding supports the Task Technology Fit Theory (Goodhue & Thompson, 1995), which states that technology has a positive impact when there is a match between task characteristics and technological capabilities.

The significant effect of the online attendance system on teacher discipline ($\beta = 0.187$, $p = 0.005$) confirms that the transparency and accountability created by the digital system encourage disciplined behavior. These results align with Muharmi & Nadriati (2022), who found that a digital attendance system improves employee discipline through objective monitoring and real-time feedback. The implementation of features such as ease of access, timely recording, data accuracy, and real-time monitoring proved to be key factors in establishing a culture of discipline and improving performance.

The Strategic Role of Teacher Discipline as a Mediator

The mediation analysis revealed the strategic role of teacher discipline as a partial mediator in the research model. Both mediation paths proved significant: Digital Literacy \rightarrow Teacher Discipline \rightarrow Teacher Performance ($\beta = 0.057$, $p = 0.032$) and Online Attendance \rightarrow Teacher Discipline \rightarrow Teacher Performance ($\beta = 0.077$, $p = 0.014$). These findings confirm that work discipline serves as a transmission mechanism from technology interventions to improved performance.

These results support Canter & Canter's (2001) Theory that work discipline is the foundation for achieving optimal performance. In the context of digital transformation, discipline relates not only to punctual attendance and regulatory compliance but also to consistent adoption and utilization of technology to enhance learning effectiveness. The stronger mediation effect of the online attendance system ($\beta = 0.077$) compared to digital literacy ($\beta = 0.057$) indicates that the digital monitoring system is more effective in shaping a culture of discipline than in developing individual competencies.

Theoretical Implications and Framework Validation

This study provides empirical validation of the integration of Task Technology Fit Theory and the TPACK Framework in the context of educational human resource management. The significance of all path coefficients confirms that digital transformation is not simply the implementation of technology, but a systemic process involving competency development, organizational culture change, and performance optimization. The structural model, with R^2 for Teacher Performance = 0.209 and Teacher Discipline = 0.149, demonstrates moderate but meaningful variance explained in the context of behavioral research (Cohen, 1988). The GoF value = 0.366, which falls into the large effect category, confirms the model's overall quality in explaining the phenomenon of digital-based human resource management transformation. Positive Q^2 for all endogenous constructs validates the model's predictive relevance, demonstrating accurate predictive ability.

Practical Contributions to Educational Management

The research findings provide evidence-based guidance for implementing digital transformation in educational human resource management. First, prioritize the development of teacher digital literacy through a comprehensive and ongoing training program. Second, implement a user-friendly online attendance system that considers accessibility, accuracy, and real-time monitoring. Third, the development of a discipline development program as a mediator of performance improvement that integrates technological aspects with professional character development. The predictive power of the model, demonstrated through the significance of all hypotheses, confirms that digital transformation in educational human resource management is a proven effective strategy for improving teacher professionalism and the overall quality of Education. This supports the national Education digitalization agenda and provides a blueprint for implementation in other regions with similar characteristics.

5. Conclusion

This study successfully confirmed the validity of the digital-based educational human resource management transformation model through a comprehensive analysis of 170 elementary school teachers in Bojong District, Pekalongan Regency. The results of the PLS-SEM analysis showed that all proposed hypotheses were accepted with a very good level of significance, providing strong empirical evidence of the effectiveness of technology integration in educational human resource management.

The main findings of the study indicate that digital literacy significantly influences teacher performance, confirming the importance of digital competence as a foundation for teacher performance in the digital era. The online attendance system proved to have the strongest influence on teacher performance and also contributed significantly to teacher discipline. The relationship between teacher discipline and teacher performance also proved significant, confirming the importance of behavioral aspects in achieving optimal performance.

Mediation analysis revealed the strategic role of teacher discipline as a significant partial mediator in the research model. Both mediation pathways proved valid: Digital Literacy → Teacher Discipline → Teacher Performance and Online Attendance → Teacher Discipline → Teacher Performance. These findings indicate that work discipline serves as a crucial transmission mechanism from technology interventions to improved teacher professional performance. Model validity was confirmed through an outer model evaluation, which demonstrated excellent Reliability and validity for all constructs. Cronbach's Alpha (0.820-0.872), Composite Reliability (0.881-0.911), and AVE (0.649-0.718) all exceeded the required threshold. Discriminant validity was met based on the Fornell-Larcker Criterion and the HTMT ratio. The structural model demonstrated good predictive relevance with a positive Q^2 and $GoF = 0.366$ (large effect), indicating the overall robustness of the model.

The theoretical implications of this study provide empirical validation of the integration of Task Technology Fit Theory and the TPACK Framework in the context of educational human resource management. Digital transformation is proven to be more than just technology implementation, but a systemic process involving competency development, organizational culture change, and holistic performance optimization.

Practical contributions of this study include evidence-based guidance for: (1) prioritizing teacher digital literacy development through comprehensive and ongoing training programs; (2) implementation of a user-friendly online attendance system with a focus on accessibility, accuracy, and real-time monitoring; (3) development of a discipline coaching program as a mediator of performance improvement that integrates technological aspects with professional character development. Research limitations include its limited geographic scope to the Bojong District and its cross-sectional design, which cannot measure temporal changes. Future research is recommended to use a longitudinal design, expand the geographic scope, and explore moderating variables such as teacher age, technology experience, and school characteristics.

Policy recommendations include: (1) development of a comprehensive roadmap for the digitalization of educational human resources; (2) allocation of a dedicated budget to improve teachers' digital literacy; (3) standardization of the online attendance system across all elementary schools; (4) intensive mentoring programs for teachers with low digital literacy; and (5) regular evaluation of the effectiveness of digital system implementation. This research contributes significantly to the development of educational human resource management

Theory and practice in the digital era, providing an adaptable blueprint for implementing digital transformation in various educational contexts with similar characteristics.

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