

The Effect of Digital Communication and Technology-Based Training on Employee Performance Through Work Culture at PT JPS

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Abstract

Digital transformation has driven changes in work systems across industries, including the steel and construction sector; however, empirical studies examining the role of digital communication and technology-based training in this sector remain limited, particularly in relation to employee performance through work culture. This study aims to analyze the effect of digital communication and technology-based training on employee performance through work culture at PT JPS. A quantitative approach was employed using a survey of 81 respondents selected through simple random sampling and analyzed using SEM-PLS with SmartPLS. The results show that digital communication has a significant positive effect on work culture and employee performance, while technology-based training has a significant positive effect on both variables with a stronger contribution. The model explains 73.7% of the variance in work culture and 85.9% of the variance in employee performance. However, work culture does not have a significant effect on employee performance and does not mediate the relationship between digital communication and employee performance or between technology-based training and employee performance. These findings indicate that employee performance is more directly influenced by communication quality and training effectiveness than by work culture, highlighting the importance of strengthening digital communication and technology-based training in organizational practices.

1. Introduction

The steel industry plays a vital role in national development and the global economy. The World Steel Association (2022) noted that global steel production has exceeded 1.8 billion tons per year, with Asia being the primary contributor. The industry's reliance on global supply chains makes it vulnerable to fluctuations in raw material prices and geopolitical dynamics, prompting companies to adopt digital technologies to improve efficiency, productivity, and performance quality (Barišić et al., 2021; Branca et al., 2020).

PT JPS, a company engaged in construction services and steel material supply, has implemented a digital-based work system covering communication, reporting, and employee training. However, the implementation has not yet been fully effective. Observations and interviews with management indicate that several employees, especially those with longer tenure, still face difficulties in adapting to digital technologies and do not fully understand the objectives and benefits of the system.

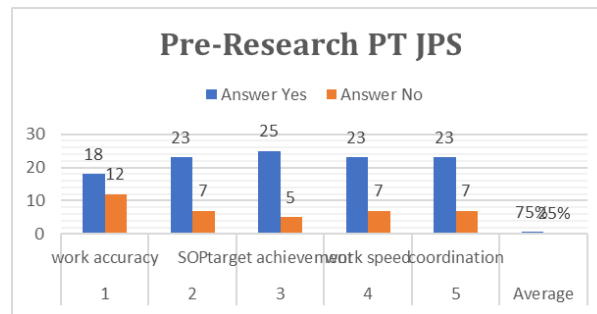


Fig. 1 PT JPS Pre-Research Diagram

Pre-research involving 30 employees also revealed that 75% of respondents experienced performance issues related to work accuracy, compliance with standard operating procedures, target achievement, timeliness, and coordination. This condition suggests that the implementation of digital systems has not yet translated into optimal employee performance. Putri's research (2024) shows that digital culture influences employee performance, so that work culture becomes a relevant aspect to study in understanding the relationship between technology utilization and performance in the context of corporate work.

Previous studies have shown that digital communication enhances collaboration and productivity Ruiz et al. (2024), while technology-based training improves employee work effectiveness (Syamsulbahri & Bardai, 2025). In addition, work culture is often positioned as a linking variable between technology utilization and employee performance (Andriani et al., 2025). In the construction sector, the use of digital technology has also been found to support team effectiveness (Simanjuntak, 2023). However, these relationships are not always direct, as they may involve mediating variables such as internal organizational conditions (Rahmawati et al., 2024).

Despite these findings, most previous studies have focused on service, government, and general human resource management contexts. Empirical research in the steel-based construction sector remains limited, particularly studies that examine work culture as a mediating variable in the relationship between digital communication, technology-based training, and employee performance.

Therefore, this study aims to analyze the effect of digital communication and technology-based training on employee performance through work culture at PT JPS. This study contributes theoretically by extending empirical evidence in the under-researched construction sector and by examining the mediating role of work culture in a digital work environment. Practically, the findings are expected to provide insights for organizations in improving employee performance through strengthening digital communication and technology-based training.

2. Literature Review

2.1 Employee Performance

Employee performance refers to an individual's ability to carry out assigned tasks effectively and to overcome various obstacles encountered during the work process (Hasibuan, 2022). In addition, employee performance can be understood as the results achieved by an individual based on predetermined standards or criteria for a particular job (Budiyanto, 2020). Furthermore, Rahman et al. (2022) state that employee performance reflects the level of task completion achieved by an individual in accordance with organizational responsibilities and standards within a specific period.

As for the dimensions and indicators of employee performance according to Fitrianto (2020) includes; 1) quantity: (a) work output, (b) workload; 2) quality: (a) work quality, (b) work accuracy; 3) timeliness: (a) timely completion, (b) work speed; 4) attendance: (a) attendance rate, (b) attendance consistency; and 5) teamwork ability: (a) teamwork, (b) work coordination.

2.2 Work Culture

Work culture refers to patterns of attitudes, behaviors, and habits of individuals in carrying out their tasks based on values adopted within an organization (Syawitri et al., 2022). Saragih (2020) explains that work culture consists of values that shape individual habits and influence the quality of task execution. Furthermore, Edrial et al. (2024) state that work culture encompasses values, perceptions, beliefs, and behavioral patterns held by individuals and groups within an organization. Thus, work culture can be understood as a system of values and norms that shape work behavior and influence employee performance.

From a theoretical standpoint, work culture is explained through Organizational Culture Theory, which suggests that organizational culture plays a critical role in shaping employee behavior and performance (Schein

& Schein, 2017). Recent studies indicate that a strong organizational culture positively affects employee performance and engagement (Nhi & Son, 2024)

According to Gibson, the dimensions and indicators of work culture are (2021) includes; 1) attitude toward work: (a) work attitude, (b) work commitment; 2) work behavior: (a) responsibility, (b) teamwork; and 3) work discipline: (a) rule compliance, (b) work orderliness.

2.3 Digital Communication

Digital communication refers to the process of conveying information through digital technology-based media (Asari et al., 2023). Wijaya et al. (2022) explain that digital communication is a form of interaction that occurs without direct physical meetings, using digital devices such as computers and smartphones. Additionally, Yourlanda (2023) states that digital communication takes place through internet networks without limitations of space and time. Based on these three views, digital communication is the process of conveying and exchanging information through digital technology and internet networks without requiring direct face-to-face meetings.

The dimensions and indicators of digital communication according to Agustina et al. (2025) includes; 1) message clarity: (a) message clarity, (b) message understanding; 2) feedback: (a) message response, (b) feedback provision; 3) communication openness: (a) information openness, (b) communication transparency; and 4) digital communication effectiveness: (a) delivery accuracy, (b) communication efficiency.

2.4 Technology-Based Training

Technology-based training refers to a form of training that utilizes digital technology as the primary medium for delivering learning materials and processes (Noe, 2020). Lasimpala et al. (2025) state that technology-based training is an approach to human resource development aimed at improving employee skills and knowledge through digital technology. Furthermore, Coetzee and Botha, as cited in Meyer (2023), explain that technology-based training includes methods such as e-learning, interactive multimedia, and virtual-based training.

Based on these perspectives, technology-based training can be understood as a digital learning process designed to enhance employee competencies effectively and flexibly. From a theoretical perspective, technology-based training is explained through Human Capital Theory, which emphasizes that investment in employee development leads to increased productivity and performance (Becker, 2015). Recent studies indicate that technology-based training has a positive effect on employee performance improvement (Kraiger & Ford, 2021).

As for the dimensions and indicators based on the concept technology-based training according to Noe (2020) includes; 1) use of digital technology: (a) digital media, (b) system ease of use; 2) flexibility: (a) time flexibility, (b) location flexibility; 3) interactivity: (a) participant engagement, (b) instructor interaction; 4) training outcomes: (a) skill improvement, (b) knowledge enhancement.

2.5 Framework of Thought

Digital communication characterized by message clarity, feedback, communication openness, and delivery effectiveness contributes to more structured and transparent work interactions, thereby supporting the development of work culture within the organization (Agustina et al., 2025). Technology-based training that incorporates digital media, system ease of use, flexibility, and interactivity facilitates the improvement of employees' skills and job-related understanding (Noe, 2020). Work culture, reflected in attitudes toward work, work behavior, and work discipline, influences the execution of daily tasks (Gibson et al., 2021). Employee performance is reflected in quantity, quality, timeliness, attendance, and teamwork ability in carrying out assigned responsibilities (Fitrianto, 2020).

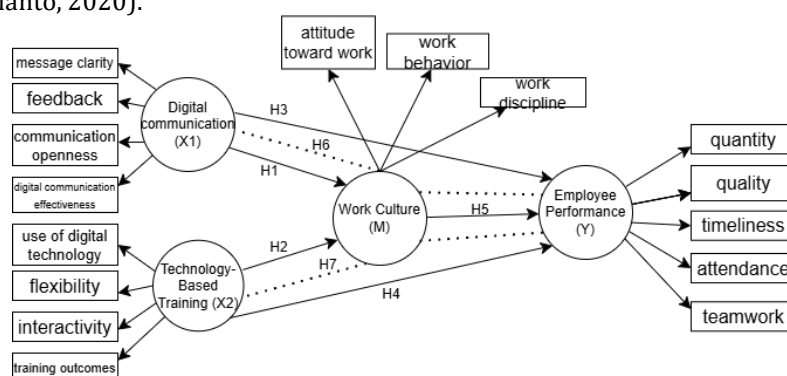


Fig. 2 Thinking Framework

(Source: Agustina et al., 2025); (Noe, 2020); (Gibson et al., 2021); (Fitrianto, 2020)

Research Hypothesis

H1: Digital communication positively affects work culture.

H2: Technology-based training positively affects work culture.

H3: Digital communication positively affects employee performance.

H4: Technology-based training positively affects employee performance.

H5: Work culture positively affects employee performance.

H6: Work culture mediates the relationship between digital communication and employee performance.

H7: Work culture mediates the relationship between technology-based training and employee performance.

3. Research Methods

This study employed a quantitative approach with a causal-associative design to examine the relationships among variables through systematic measurement and statistical analysis (Sugiyono, 2023).. The population consisted of all 101 employees of PT JPS, and the data were collected in December 2025.

The sample size was determined using the Slovin formula with a 5% margin of error, expressed as $n = \frac{N}{(1+N(e)^2)}$, based on the calculation $n = \frac{101}{(1+101(0.05)^2)} = 80,6$, the sample size was rounded up to 81 respondents, which is considered representative of the population. The study applied a probability sampling technique using the simple random sampling method, ensuring that each member of the population had an equal chance of being selected as a respondent (Asrulla et al., 2023).

Table 1 Operational Variables

Variables	Dimensions	Indicator	Source of Variables Theory	Dimensions	Indicator	Source of Theory
Digital Communication (X1)	Message Clarity	1. Message Clarity 2. Message Understanding	Agustina et al. (2025)	Attitude Towards Work	1. Work Attitude 2. Work Commitment	Gibson et al. (2021)
	Feedback	1. Message Response 2. Feedback Provision		Work Behavior	1. Responsibility 2. Teamwork	
	Communication Openness	1. Information Openness 2. Communication Transparency		Work Discipline	1. Rule Compliance 2. Work Orderliness	
	Digital Communication Effectiveness	1. Delivery Accuracy 2. Communication Efficiency		Employee Performance (Y)	1. Work Output 2. Workload	
Technology-Based Training (X2)	Use of Digital Technology	1. Digital Media 2. System Ease of use	Noe (2020)	Quality	1. Quality Work 2. Work Accuracy	Fitrianto (2020)
	Flexibility	1. Time Flexibility 2. Location Flexible		Timeliness	1. Timely Completion 2. Work Speed	
	Interactivity	1. Participant engagement 2. Instructor Interaction		Attendance	1. Attendance Rate 2. Consistency of Attendance	
	Training outcomes	1. Skills Improvement 2. Knowledge enhancement		Teamwork Ability	1. Teamwork 2. Work Coordination	

Data were collected using a structured questionnaire as the primary research instrument. The questionnaire items were adapted from relevant previous studies to ensure content validity, including Agustina et al. (2025) for digital communication, Noe (2020) for technology-based training, Gibson et al. (2021) for work culture, and Fitrianto (2020) for employee performance. Each variable was measured using multiple indicators, consisting of 8 items for digital communication, 8 items for technology-based training, 6 items for work culture, and 10 items

for employee performance. All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The data sources included primary data obtained through questionnaires and secondary data derived from books and relevant academic journals to support the theoretical framework. Data analysis was conducted using Structural Equation Modeling based on Partial Least Squares (SEM-PLS) with the assistance of SmartPLS software (Hair et al., 2021). SEM-PLS was selected due to its suitability for studies with relatively small sample sizes and its ability to analyze complex models in an exploratory context. The analysis was carried out in two main stages, namely descriptive analysis and inferential (verification) analysis.

4. Research Results and Discussion

4.1 Company Profile

PT JPS is a company engaged in the field of construction services, and providing steel materials to support infrastructure development in the Regency Karawang and surrounding areas. The company is located in Klari District, Karawang Regency, West Java, and was officially established on October 30, 2023. Previously, the company operated under a different name from 2013 to 2024 as part of organizational strengthening and business development. PT JPS currently employs 101 people.

4.2 Respondent Characteristic

Respondent characteristics describe the profile of 81 respondents based on age, highest education, gender, and length of service.

Table 2 *Respondent Characteristics*

Characteristics	Category	Number of people)	Percentage (%)	Characteristics	Category	Number of people)	Percentage (%)
Age	20-30 Years	29	35.80	Gender	Woman	4	4.94
	30-40 Years	24	29.63		Man	77	95.06
	41 - 50 Years	18	22.22	Total		81	100
	>50 Years	10	12.35	Length of work	1-3 Years	21	25.93
	Total	81	100		4-6 Years	36	44.44
Last education	Junior High School	46	56.79		7-9 Years	13	16.05
	High School/Vocational School	35	43.21		>10 Years	11	13.58
	Total	81	100	Total		81	100

Based on table 2, the majority of respondents were aged 20-30 years (35%), had a junior high school education (56%), and were male (95%), reflecting the characteristics of the construction sector workforce. In terms of length of service, the group with 4-6 years of experience was the largest (44%), indicating that most employees have adequate work experience.

4.3 Descriptive Analysis

Descriptive analysis is used to describe research data without making generalizations or inferential conclusions (Sugiyono, 2023). The score interval in this study was determined based on the Likert scale measurement, where each item was rated from 1 to 5. With a total of 81 respondents, the minimum possible score is calculated as $1 \times 81 = 81$, while the maximum possible score is $5 \times 81 = 405$. The range of scores is therefore $405 - 81 = 324$, which is then divided into five categories to obtain a class interval of 64.8. Based on this calculation, the assessment criteria are classified as follows: 81.0–145.8 (very poor), 145.9–210.6 (poor), 210.7–275.4 (moderate), 275.5–340.2 (good), and 340.3–405.0 (very good).

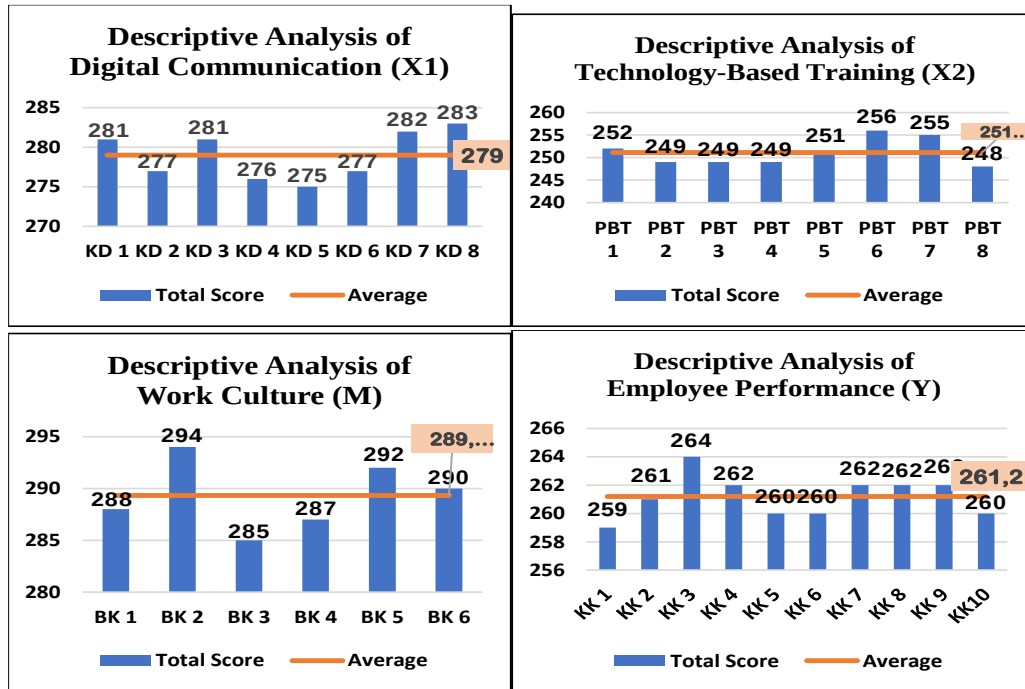


Fig. 3 Descriptive Analysis

Based on Figure 3, digital communication shows a relatively strong performance, particularly in supporting task coordination and information delivery. However, its role in facilitating open expression and interactive feedback remains less optimal, indicating an imbalance between operational efficiency and communicative flexibility. Technology-based training demonstrates effective digital interaction between participants and instructors, yet the relatively lower improvement in participant knowledge suggests that the training may be more procedural than transformational in enhancing competencies.

Work culture reflects a supportive environment for technology adoption, especially in promoting responsibility and teamwork. Nevertheless, certain aspects such as discipline consistency and internalization of organizational values may still require reinforcement to ensure sustainable behavioral alignment. Meanwhile, employee performance indicates stronger outcomes in terms of work accuracy compared to productivity volume, implying that employees tend to prioritize precision over output quantity. This pattern suggests a need for balancing efficiency and effectiveness to optimize overall performance.

4.4 Verification Analysis

4.4.1 Convergent Validity Test

Convergent validity test was conducted with the criteria of outer loading ≥ 0.70 and AVE ≥ 0.50 (Hair et al., 2021).

Table 3 Outer Loading

Digital Communication (X1)			Technology-Based Training (X2)			Work Culture (M)			Employee Performance (Y)		
Indicator	Outer Loading	Interpretation	Indicator	Outer Loading	Interpretation	Indicator	Outer Loading	Interpretation	Indicator	Outer Loading	Interpretation
KD.1	0.891	Valid	PBT.1	0.968	Valid	BK.1	0.919	Valid	KK.1	0.960	Valid
KD.2	0.896	Valid	PBT.2	0.980	Valid	BK.2	0.894	Valid	KK.2	0.969	Valid
KD.3	0.896	Valid	PBT.3	0.984	Valid	BK.3	0.938	Valid	KK.3	0.975	Valid
KD.4	0.929	Valid	PBT.4	0.981	Valid	BK.4	0.904	Valid	KK.4	0.958	Valid
KD.5	0.924	Valid	PBT.5	0.960	Valid	BK.5	0.912	Valid	KK.5	0.963	Valid
KD.6	0.902	Valid	PBT.6	0.965	Valid	BK.6	0.924	Valid	KK.6	0.960	Valid
KD.7	0.907	Valid	PBT.7	0.975	Valid				KK.7	0.963	Valid
KD.8	0.903	Valid	PBT.8	0.984	Valid				KK.8	0.961	Valid
									KK.9	0.965	Valid
									KK.10	0.969	Valid

Based on Table 3, all indicators exhibit outer loading values above 0.70, indicating that all constructs meet the convergent validity criteria. This suggests that the indicators adequately represent their respective constructs. However, several indicators show very high outer loading values (above 0.95), particularly for technology-based training and employee performance. While this reflects strong indicator reliability, it may also indicate a high degree of similarity among certain measurement items.

4.4.2 Construct Reliability

Reliability is tested through Cronbach's alpha and composite reliability values, with the construct criteria being declared reliable if the composite reliability value is > 0.70 (Hair et al., 2021).

Table 4 Construct Reliability

Variables	Cronbach's Alpha	Composite Reliability (Rho_A)	Composite Reliability (Rho_C)	Average Variance Extracted (AVE)
Digital Communication	0.969	0.970	0.973	0.821
Technology-Based Training	0.992	0.993	0.993	0.950
Work Culture	0.961	0.965	0.969	0.838
Employee performance	0.992	0.992	0.993	0.930

Source: Research Data Analyzed, 2026

As presented in Table 5, all constructs exceed the threshold, indicating satisfactory internal consistency. These results confirm that the measurement model is reliable and that the indicators consistently represent their respective constructs.

4.4.3 Discriminant Validity Analysis

The HTMT test is used to assess discriminant validity through correlations between latent constructs. *Fornell-Larcker Criterion* conducted to evaluate discriminant validity by comparing the square root of AVE for each construct with the correlation value between constructs (Ghozali, 2023).

Table 5 HTMT (Heterotrait-Monotrait Ratio) and Fornell-Larcker Criterion

HTMT (Heterotrait-Monotrait Ratio)				
	Digital Communication	Technology-Based Training	Work Culture	Employee performance
Digital Communication				
Technology-Based Training	0.467			
Work Culture	0.803	0.681		
Employee performance	0.601	0.893	0.753	

Source: Research Data Analyzed, 2026

Fornell-Larcker Criterion			
Digital Communication	Technology-Based Training	Work Culture	Employee performance
0.906			
0.459	0.975		
0.784	0.671	0.915	
0.591	0.887	0.742	0.964

Source: Research Data Analyzed, 2026

Discriminant validity of the constructs was assessed using the HTMT (Heterotrait-Monotrait Ratio) and the Fornell-Larcker criterion. In this study, an HTMT threshold of 0.90 was applied, which is commonly used in exploratory research. The results indicate that all HTMT values are below 0.90, suggesting that each construct is empirically distinct and that discriminant validity is achieved. Furthermore, based on the Fornell-Larcker criterion, the square root of the Average Variance Extracted (AVE) for each construct (diagonal values) is greater than the correlations between constructs, indicating that the model satisfies the requirements for discriminant validity.

4.5 Structural Model Evaluation

The structural model in PLS-SEM explains the relationships and influences between latent constructs in a research model (Hair et al., 2022).

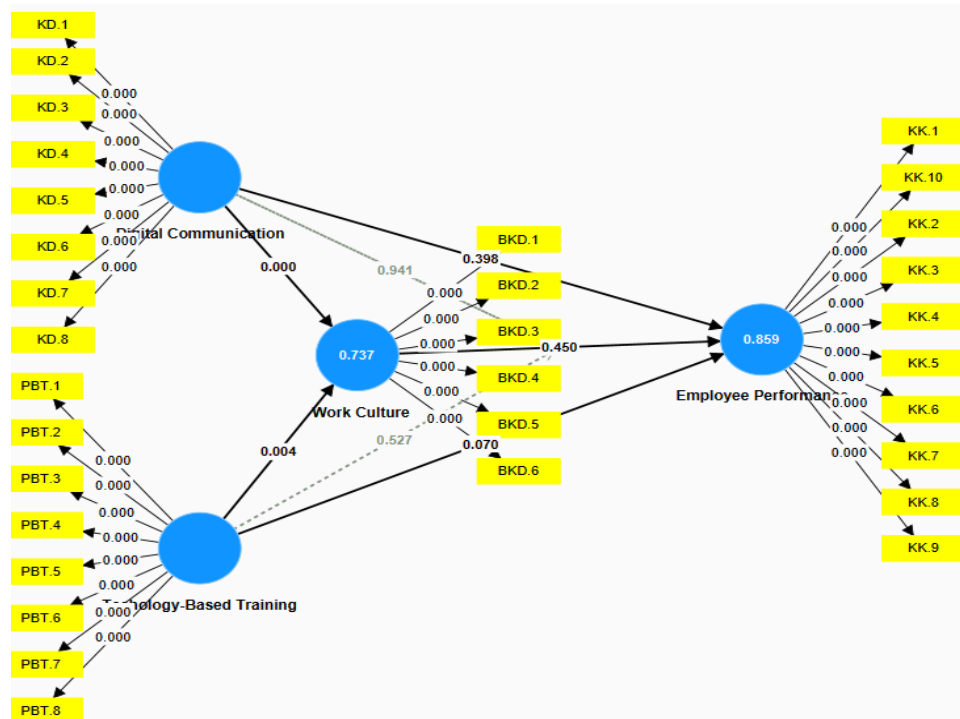


Fig. 4 Structural Model

Figure 4 shows that digital communication and technology-based training have a positive effect on work culture and employee performance. The r -square values of 0.737 and 0.859 indicate a strong model, with the direct influence of both variables greater than that of work culture on performance.

4.5.1 R Square (R^2)

Testing r -square (R^2) used to determine how much exogenous variables explain changes in endogenous variables in the research model (Ghozali, 2023).

Table 6 R Square (R^2)

Variables	R -square	R -square adjusted
Work Culture	0.737	0.730
Employee Performance	0.859	0.850

Source: Research Data Analyzed, 2026

The R^2 value of 0.737 indicates that digital communication and technology-based training explain 73.7% of the variance in work culture. The R^2 value of 0.859 indicates that digital communication, technology-based training, and work culture jointly explain 85.9% of the variance in employee performance. This relatively high explanatory power suggests that the proposed model captures key determinants of performance in the PT JPS context, although it may also reflect strong conceptual overlap among some constructs.

4.5.2 F Square (F^2)

Testing f -square conducted to see the magnitude of the contribution of each exogenous variable to the endogenous variable in the structural model (Ghozali, 2023).

Table 7 F Square (F^2)

Variables	f -square	Interpretation
Digital Communication -> Work Culture	1.089	Big Effect
Digital Communication -> Employee Performance	0.108	Small Effect
Technology-Based Training -> Work Culture	0.469	Big Effect
Technology-Based Training -> Employee Performance	0.491	Big Effect
Work Culture -> Employee Performance	0.120	Small Effect
Digital Communication x Work Culture -> Employee Performance	0.005	Small Effect
Technology-Based Training x Work Culture -> Employee Performance	0.178	Small Effect

Analysis results *effect size* table 8 shows that digital communication contributes significantly to work culture, but its relationship to employee performance is weaker. Technology-based training has the highest contribution to both variables. Meanwhile, work culture contributes less to performance than the direct influence of technology-based training.

4.5.3 Q Square (Q^2)

A q-square value greater than zero indicates that the model has adequate predictive relevance (Ghozali, 2023).

Table 8 Q -square (Q^2)

Variables	SSO	SSE	$Q^2 (=1-SSE/SSO)$
Digital Communication	648,000	648,000	0.000
Technology-Based Training	648,000	648,000	0.000
Work Culture	486,000	197,988	0.593
Employee performance	810,000	186,396	0.770

Source: Research Data Analyzed, 2026

The Q^2 values for work culture (0.593) and employee performance (0.770) are greater than zero, indicating that the model has predictive relevance for these endogenous constructs. The Q^2 values of 0.000 for digital communication and technology-based training are expected because these variables are exogenous and are not predicted by other constructs in the model.

4.5.4 FIT Model

Model fit testing is carried out to assess the level of suitability between the research model and the data used (Ghozali, 2023).

Table 9 FIT Model

	<i>Saturated model</i>	<i>Estimated model</i>
SRMR	0.061	0.063
d_ULS	1.937	2.104
d_G	n/a	n/a
Chi-square	∞	∞
NFI	n/a	n/a

Source: Research Data Analyzed, 2026

The SRMR values of 0.061 for the saturated model and 0.063 for the estimated model are below the recommended threshold of 0.08, indicating acceptable model fit. In PLS-SEM, SRMR is commonly used as a model fit index, while global fit indices such as chi-square are not emphasized to the same extent as in covariance-based SEM.

4.6 Hypothesis Testing

Hypothesis testing is used to determine the significance of the relationship between variables in the research model by looking at the *value-statistic* and p-value (Hair et al., 2022).

Table 10 Total Influence Hypothesis

Variables	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Digital Communication-> Work Culture	0.602	0.596	0.125	4.817	0.000
Digital Communication-> Employee Performance	0.377	0.434	0.155	2.428	0.015
Technology-Based Training-> Work Culture	0.395	0.409	0.138	2.854	0.004
Technology-Based Training-> Employee Performance	0.632	0.525	0.208	3.043	0.002
Work Culture > Employee Performance	0.286	0.388	0.379	0.755	0.450
Digital Communication -> Work Culture -> Employee Performance	0.027	0.178	0.361	0.073	0.941

Variables	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Technology-Based Training -> Work Culture-> Employee Performance	-0.246	-0.526	0.389	0.632	0.527

Based on Table 10, digital communication has a significant positive effect on work culture ($t = 4.817$; $p = 0.000$) and employee performance ($t = 2.428$; $p = 0.015$). Technology-based training also has a significant positive effect on work culture ($t = 2.854$; $p = 0.004$) and employee performance ($t = 3.043$; $p = 0.002$). In contrast, work culture does not have a significant effect on employee performance ($t = 0.755$; $p = 0.450$). Furthermore, work culture does not mediate the relationship between digital communication and employee performance ($t = 0.073$; $p = 0.941$), nor between technology-based training and employee performance ($t = 0.632$; $p = 0.527$).

Accordingly, H1, H2, H3, and H4 are accepted, while H5, H6, and H7 are rejected. In addition, the negative coefficient observed in the indirect effect of technology-based training through work culture ($\beta = -0.246$) indicates that work culture does not strengthen the relationship between technology-based training and employee performance. This suggests that the effect of training on performance occurs more directly rather than through cultural mechanisms.

5. Discussion

5.1 Digital Communication Impacts Work Culture

Based on the test results, the value obtained *t-statistic* of 4.817 with a *p-value* of 0.000 (<0.05), so the hypothesis is accepted. The suitability of responses received through digital media with communication needs seems to reflect the characteristics of digital communication. Relevant and appropriate responses support the development of more structured work patterns aligned with technology use. When communication is clear and responsive, digital-based work habits tend to develop more easily. These results align with Ruiz et al. (2024) and Asari et al. (2023) which states that digital communication is related to the formation of an adaptive work culture.

5.2 Technology-Based Training Impacts Work Culture

Based on the test results, a *t-statistic* value of 2.428 was obtained with a *p-value* of 0.015 (<0.05), thus the hypothesis was accepted. Improved work skills after participating in the training were seen predominantly reflecting technology-based training. This increased competence helps employees adapt to digital work systems, thus supporting the formation of work habits aligned with the use of technology. These results align with Hasanah and Pasaribu (2025) which explains that technology-based training is related to the formation of digital work habits.

5.3 Digital Communication Impacts Employee Performance

Based on the test results, a *t-statistic* value of 2.854 was obtained with a *p-value* of 0.004 (<0.05), thus the hypothesis is accepted. Responsive digital communication that is aligned with job requirements is related to accuracy in completing tasks. Clear and accurate information helps reduce errors and supports smooth coordination, resulting in more focused work implementation. These results align with Putro's findings (2023) and Ruiz et al. (2024) which states that digital communication is related to work productivity.

5.4 Technology-Based Training Impacts Employee Performance

Based on the test results, a *t-statistic* value of 3.043 was obtained with a *p-value* of 0.002 (<0.05), thus the hypothesis was accepted. Technology-based training that improves work skills and understanding is related to accuracy in carrying out tasks. Mastery of procedures and utilization of technology support systematic work completion. These results align with Hasanah and Pasaribu. (2025) as well as Syamsulbahri and Bardai (2025) which states that technology-based training related to improving performance.

5.5 Work Culture Influences Employee Performance

Based on the test results, a *t-statistic* value of 0.755 was obtained with a *p-value* of 0.450 (>0.05), thus the hypothesis was rejected. The findings reveal that work culture does not exert a direct influence on employee performance. This suggests that, in the construction sector, performance is predominantly shaped by technical factors, including skill proficiency, work experience, and strict adherence to operational and safety procedures. Given the project-based and technically intensive nature of construction work, performance tends to be evaluated

through tangible outputs such as productivity and quality, rather than through the internalization of organizational values.

This indicates that work culture in this context functions more as an *enabling condition* rather than a *primary driver* of performance. While it may support a conducive work environment, its effect remains indirect and contingent upon the presence of strong technical capabilities and structured work systems. This finding is consistent with Edrial et al. (2024) and Gibson et al. (2021) who emphasize that the impact of work culture depends on the depth of value internalization and may not always be immediately observable. However, this result contrasts with prior studies in service-oriented sectors, where cultural factors play a more prominent role, thereby highlighting the importance of industry-specific dynamics.

From a theoretical standpoint, these findings challenge the general assumption that work culture universally drives employee performance. Instead, they underscore the contextual nature of organizational behavior, particularly in technically driven environments. From a managerial perspective, this implies that improving performance requires not only reinforcing cultural values but also prioritizing technical skill development, operational discipline, and effective supervision.

5.6 Work Culture Mediates the Influence of Digital Communication on Employee Performance

The test results obtained a t-statistic of 0.073 with a p-value of 0.941 (>0.05), thus rejecting the hypothesis. The results further indicate that work culture does not mediate the relationship between digital communication and employee performance, suggesting a direct relationship between the two variables. This implies that the effectiveness of digital communication is realized through immediate operational benefits rather than through cultural transformation.

In the construction context, digital communication primarily facilitates real-time coordination, accurate information exchange, and efficient task execution. These functional advantages directly enhance employee performance without necessarily being mediated by shared cultural values. This finding aligns with Hair et al. (2021) which posits that mediation is absent when indirect effects are not significant, and is further supported by Leonardi (2021) who highlights the direct impact of digital communication on performance outcomes.

Theoretically, this finding positions digital communication as an instrumental resource rather than a cultural catalyst within this context. It suggests that technological tools can bypass traditional behavioral mechanisms and directly influence work outcomes. From a managerial perspective, this underscores the importance of optimizing communication systems in terms of clarity, responsiveness, and coordination efficiency, rather than relying on cultural alignment to enhance performance.

5.7 Work Culture Mediates the Effect of Technology-Based Training on Employee Performance

Based on the test results, a t-statistic value of 0.632 was obtained with a p-value of 0.527 (>0.05), so the hypothesis was rejected. Similarly, the findings demonstrate that work culture does not mediate the relationship between technology-based training and employee performance. This indicates that the impact of training is primarily direct, operating through the enhancement of employees' knowledge, technical competencies, and task execution capabilities.

In highly technical environments such as construction, training programs are typically designed to address practical and procedural needs. As a result, their outcomes are more immediately reflected in improved job performance, rather than through gradual changes in organizational culture. This explains why work culture does not emerge as a significant intermediary in this relationship.

This result is consistent with Hair et al. (2021) and supported by Noe (2020), who argue that training interventions often yield direct performance improvements. However, it diverges from studies suggesting that training can serve as a mechanism for cultural transformation, indicating that such effects may be contingent upon the nature of the work environment.

From a theoretical perspective, these findings reinforce the argument that mediation effects are context-dependent and not universally applicable. From a managerial standpoint, organizations should prioritize designing training programs that are practical, task-oriented, and aligned with operational demands to maximize their direct contribution to performance.

6. Conclusion

This study finds that digital communication and technology-based training have a significant positive effect on work culture and employee performance at PT JPS, with technology-based training showing a stronger contribution. However, work culture does not have a significant effect on employee performance and does not mediate the relationship between digital communication, technology-based training, and employee performance.

These findings contribute to the literature by providing empirical evidence from the under-researched steel-based construction sector and highlighting that employee performance is more directly influenced by communication quality and training effectiveness than by work culture.

7. Implication

1. Theoretical Implications

This study contributes to the literature by providing empirical evidence that digital communication and technology-based training have a direct role in improving employee performance, while work culture does not function as a significant mediating variable. These findings suggest that, in the context of steel-based construction, performance is more strongly influenced by operational and capability-based factors than by cultural mechanisms. This study also extends prior research by examining these relationships in an under-researched sector.

2. Managerial Implications

From a practical perspective, companies should strengthen digital communication by improving message clarity, responsiveness, and consistency across work processes. In addition, organizations are encouraged to enhance technology-based training through more structured programs, such as digital mentoring for senior employees, structured onboarding for new systems, and regular refresher training to improve technical understanding and skill application. Furthermore, companies need to create a supportive work environment by ensuring access to digital tools, providing continuous guidance, and aligning daily work practices with technology utilization to improve overall work quality and employee performance.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Nadya Wulansari, Uus Mohammad Darul Fadli and Ery Rosmawati; **data collection:** Nadya Wulansari, Uus Mohammad Darul Fadli and Ery Rosmawati; **analysis and interpretation of results:** Nadya Wulansari, Uus Mohammad Darul Fadli and Ery Rosmawati; **draft manuscript preparation:** Nadya Wulansari, Uus Mohammad Darul Fadli and Ery Rosmawati. All authors reviewed the results and approved the final version of the manuscript.

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