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The Effect of Digital Training and Digital Competencies on Employee Work Productivity at Bank Indonesia in Cirebon

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Digital Training; Digital Competency; Work Productivity; PLS-SEM; Digital Transformation.

Abstract

This study aimed to analyze the effects of digital training and digital competency on employee work productivity at Bank Indonesia Cirebon. Digital transformation in the banking sector requires human resource development to adapt to technology-based work systems. This study employed a quantitative associative approach using a survey method involving 60 respondents selected through a saturated sampling technique. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results showed that digital training had a positive and significant effect on work productivity, with a path coefficient of 0.623 ($p < 0.05$). Digital competency also had a positive and significant effect on work productivity, with a path coefficient of 0.411 ($p < 0.05$). Simultaneously, both variables explained 66.2% of the variance in employee productivity. These findings indicated that improving the quality of digital training and strengthening digital competency were essential factors in enhancing employee effectiveness, efficiency, and performance in the digital transformation era. This study provides practical implications for organizations in developing structured and sustainable digital training programs to improve employee productivity.

INTRODUCTION

Digital transformation has become a major catalyst in the modern workplace, particularly in the banking sector, which is at the forefront of adopting digital information systems and financial technologies. In the era of Industry 4.0, digital technology is no longer merely an operational tool but has evolved into a fundamental organizational capability that supports productivity improvement and competitiveness (Bai et al., 2024). Bank Indonesia, as the central bank, plays a role not only as a regulator but also as an agent of change in promoting digitalization across its operational functions. This development is reinforced by empirical evidence showing that since 2023, Bank Indonesia has actively implemented various digital training programs, including digital literacy training, artificial intelligence (AI) utilization, and digital marketing certification programs for employees (Rustam, Astuti, & Safitri, 2024). These initiatives aim to strengthen employee capabilities and competencies in adapting to rapid technological developments (da SILVA, 2025; Treviño-Elizondo & García-Reyes, 2023).

However, the implementation of digitalization in Indonesia's banking sector has not progressed without challenges. Data from Bank Mandiri in 2022 indicated that employee productivity levels fluctuated in recent years, with a 3.2% decline in 2022 compared with the previous year. Several branches, such as the Surabaya Branch, experienced a more substantial decline of up to 7.5% (Sari et al., 2024). This phenomenon indicates a gap between the demands of digital transformation and employees' digital competency readiness. Many work activities have shifted to digital systems, including the use of collaborative applications, digital document management systems, and administrative software. However, field observations suggest that some employees still face challenges in optimizing digital platforms, particularly in developing technology-based learning media and utilizing digital tools effectively (Mauladiah, 2024).

This condition reflects a broader gap between the speed of technological adoption and the maturity of human resource digital competencies. Digital competency encompasses the ability to operate technological tools, adapt to emerging technologies, improve digital work efficiency, solve technology-related problems, and communicate effectively through digital platforms (Sarifudin et al., 2025). The digital transformation era requires human resources with specialized skills, technological understanding, and problem-solving capabilities, particularly in information technology. The ability to utilize digital platforms, understand technological trends, demonstrate openness toward technological change, collaborate virtually, and maximize digital tools in daily work has become an essential foundation for organizational adaptation (Azizah, 2023; Mujtahidin et al., 2025). Previous research indicates that digital competency contributes 64% to employee work productivity, while the remaining 36% is influenced by other factors (Awlia et al., 2024).

Digital-based training has emerged as a strategic approach to addressing digital competency gaps. Effective training programs can equip employees with relevant digital skills, enabling them to adapt to technological changes and contribute more effectively to organizational performance. Digital training is a systematic learning process designed to improve employees' knowledge, skills, and abilities in utilizing digital technologies to enhance work effectiveness. Unlike conventional training, digital training integrates platforms such as e-learning, Learning Management Systems (LMS), and artificial intelligence (AI) to support flexible, personalized, and continuous learning (Hasanah et al., 2025). Empirical studies indicate that digitalization in training through e-learning and LMS contributes significantly to improving technical competencies and soft skills among banking employees. Furthermore, research in the Indonesian banking sector has shown that digital competency significantly influences employee work productivity (Puspitadewi, 2019). Hasanah et al. (2025) further emphasized that digital training not only improves operational efficiency but also promotes an adaptive, collaborative, and innovative work culture in addressing Industry 4.0 challenges. Nevertheless, digital training implemented primarily through online platforms may create challenges, including limited face-to-face interaction, difficulties in resolving technical issues in real time, and undetected gaps in learning comprehension (Ratnaningsih, 2024).

Employee work productivity, defined as the ability to generate optimal outputs using available resources within a specific period, is an important indicator of organizational performance (Darwin & Master, 2025). In the context of Bank Indonesia, productivity is not

only measured through quantitative indicators, such as the number of completed transactions or services, but also through qualitative dimensions, including the accuracy of policy decisions, responsiveness to economic dynamics, and innovation capabilities in developing monetary instruments. Recent research demonstrates that digital transformation can significantly improve Total Factor Productivity (TFP), with TFP growth in China reaching 2.73%, supported by labor contributions of 64.97% and digital capital contributions of 35.01% during the 2012–2021 period (Bai et al., 2024). These findings highlight that while human resources remain a key driver of productivity, digital training has become increasingly important in supporting productivity enhancement. Similarly, Xiong et al. (2025) found that corporate digital transformation had a positive and significant effect on TFP, with a regression coefficient of 0.0264.

However, the success of digital training does not depend solely on the implementation of learning technologies. Research in various organizations indicates that major challenges include inadequate alignment between training materials and practical needs, limited confidence in using digital tools, unequal access to training across divisions, resistance to technological change—particularly among senior employees—and insufficient technological infrastructure (Widianto et al., 2025). These challenges demonstrate that digital literacy and technology adoption require a comprehensive approach integrating technical, cognitive, and behavioral aspects. Previous studies have often focused on technical training and specialized skills without fully considering individual characteristics that influence training effectiveness. For example, Suhardi et al. (2023) found that training and motivation programs significantly affected work productivity; however, the study did not specifically examine digital training.

Furthermore, Firdiyanti (2017), in research conducted at PT. Subaindo Cahaya Polintraco, found that training did not significantly affect employee work productivity because training programs had been conducted frequently and employee competencies were already adequate. These findings indicate that the effectiveness of training in improving productivity depends on organizational context, relevance of training materials, and employee characteristics and experiences.

Although numerous studies have examined the relationship between digital training and work productivity, several research gaps remain. First, most empirical studies have focused on profit-oriented sectors, such as manufacturing, commercial banking, and technology industries, while research examining public institutions, particularly central banks, remains limited.

This research seeks to address this gap by examining how digital training and digital competency influence employee work productivity at Bank Indonesia. Scientifically, this study provides empirical evidence regarding the relationship between digital training, digital competency, and productivity while identifying factors that contribute to effective digital learning implementation. Practically, the findings may assist Bank Indonesia in designing and implementing digital training programs that are more relevant to employee needs, including younger generations who are highly familiar with digital technologies.

The novelty of this research lies in its focus on the central banking context in Indonesia, which remains relatively underexplored in digital transformation studies. Unlike previous research that often examines training and competency as separate variables, this study integrates both variables into a single model to analyze their individual and combined effects

on employee work productivity. Furthermore, this study applies a saturated sampling technique, involving the entire population of employees at Bank Indonesia Cirebon, thereby providing a comprehensive representation of the research variables. This approach enables a deeper understanding of digital training and competency dynamics within a real organizational environment.

This research also provides strategic recommendations for organizations in designing and implementing digital training programs and improving digital competencies, including the utilization of digital-based training methods, interactive simulations, instructional videos, and mobile learning applications. In addition, this study emphasizes the importance of integrating technological developments and banking industry dynamics into training design to ensure that acquired competencies directly support improvements in employee performance.

METHOD

Research Design

This study employed a causal associative quantitative approach to examine the effect of Digital Training (X1) and Digital Competence (X2) on Employee Work Productivity (Y) at Bank Indonesia (Sugiyono, 2019). Data were collected using questionnaire instruments and analyzed through statistical techniques to objectively and empirically evaluate the relationships among the variables (Scott, 2019).

Population and Sample

The population in this study is all employees who work at Bank Indonesia Cirebon, which is 60 people. Given the relatively limited population size, the sampling technique used in this study is the total sampling method (saturated sampling). Through this technique, all members of the population totaling 60 people were taken as a whole to be used as a sample or research respondent.

Data Types and Sources

1. **Primary Data:** Primary data was obtained directly from respondents through the distribution of structured questionnaires to Bank Indonesia employees who met the sample criteria. The questionnaire contains statements related to digital training variables and employee work productivity that will be measured using the Likert scale.
2. **Secondary Data:** obtained from a variety of sources that support research, including literature, scientific articles, and other publications related to digital training and work productivity.

Data Collection Techniques

Collectorn data primer tonguekukan melalui instrument questionnaire yang dirancang berskala Likert 1–5 (1 = Sangat Tidak Agree, 5 = Sangat Agreed) to measure the perception of the respondent secarakuantita.. Questionnaire is given.. person to indicate .. person who is the person who is responsible for the death of the person in the first place.. the person who is responsible for the death of the persongi ratato be loyalp variabel.

RESULTS AND DISCUSSION

Results of Research Data Analysis

Table 1. Model Measurement Test

Variabel	Indicator	Outer Loading	AVE	Cronbach's Alpha	Composite Reability
Digital Training	X1.1	0.743			
	X1.2	0.744			
	X1.3	0.813			
	X1.4	0.847			
	X1.5	0.809	0.614	0.930	0.941
	X1.6	0.772			
	X1.7	0.702			
	X1.8	0.811			
	X1.9	0.830			
	X1.10	0.752			
Digital Competence	X2.1	0.792			
	X2.2	0.790			
	X2.3	0.706			
	X2.4	0.775			
	X2.5	0.709	0.572	0.917	0.930
	X2.6	0.746			
	X2.7	0.781			
	X2.8	0.754			
	X2.9	0.799			
	X2.10	0.705			
Work Productivity	Y1	0.755			
	Y2	0.760			
	Y3	0.755			
	Y4	0.731			
	Y5	0.815	0.579	0.919	0.932
	Y6	0.744			
	Y7	0.783			
	Y8	0.770			
	Y9	0.788			
	Y10	0.702			

The analysis of the measurement model (outer model) was carried out to ensure that the construct of Digital Training, Digital Competence, and Work Productivity has met the standards of validity and reliability required in this study. The measurement model test included the evaluation of *the outer loading* value, *Average Variance Extracted* (AVE), *Cronbach's alpha*, and *composite reliability* as presented in Table 2.

Based on the results in Table 2, all indicators that measure the construct of Digital Training, Digital Competence, and Work Productivity have *an outer loading* value above 0.70. This shows that each indicator is able to represent its construct well and is declared valid. In addition, the AVE value in each construct has also exceeded the minimum limit of 0.50, which is 0.614 for Digital Training, 0.572 for Digital Competence, and 0.579 for Work

Productivity. Thus, it can be concluded that each construct is able to explain more than 50% of the variance of its constituent indicators, thus meeting the criteria of convergent validity.

Furthermore, the results of the reliability evaluation showed that the entire construct had *Cronbach's alpha* and *composite reliability* values above 0.70. *Cronbach's alpha* value for the Digital Training construct is 0.930, Digital Competence is 0.917, and Work Productivity is 0.919. Meanwhile, the *composite reliability* value of each construct was 0.941 for Digital Training, 0.930 for Digital Competence, and 0.932 for Work Productivity. These results show that the entire construct has a high level of internal consistency, so that the measurement model in this study is declared reliable and feasible to proceed to the next stage.

Table 2. Output R Square dan Adjusted R Square

Model	R-square	Adjusted R-square
X1 and X2 to Y	0.662	0.650

Structural model evaluation was carried out to assess the model's ability to explain the causal relationship between latent constructs. This assessment includes checking the R-square (R^2) and Adjusted R-square values**,** as presented in Table 2.

The test results showed that the R-square value reached 0.662. This shows that the independent variables in this study were able to explain the dependent variables by 66.2%, while the remaining 33.8% were explained by other variables outside the research model. Meanwhile, the R-square adjusted value of 0.650 indicates that after adjusting for the number of independent variables used in the model.

These results show that Digital Training (X1) and Digital Competence (X2) together are able to explain 65.0%–66.2% variation in Work Productivity**.** This value is in the medium to strong category**,** which indicates that the research model has good and significant explanatory ability. Meanwhile, the remaining variation of 33.8% was explained by other factors outside the research model that were not examined in this study.

These findings confirm that Digital Training and Digital Competencies have an important role in increasing employee Work Productivity**.** Structured and relevant digital training is able to improve understanding and technology-based work skills, while high digital competence allows employees to work more effectively, efficiently, and adaptively to job demands. The combination of the two makes a real contribution in encouraging increased work productivity.

The results of this study are in line with the theoretical views and previous research that states that digital skills mastery and continuous training support are key factors in improving work performance and productivity in the digital era. Thus, in the context of this research, organizations need to pay serious attention to the development of digital training and the improvement of employees' digital competencies in order to achieve optimal work productivity.

Table 3. Output F Square

Variabel	Work Productivity (Y)
X1	1.099
X2	0.479

Based on Table 3 *Output F Square*, the value of f^2 is used to measure the effect size of the exogenous variable on the endogenous variable, namely Work Productivity (Y). The

value of f^2 indicates how much contribution each independent variable makes in explaining the dependent variable when it is included in the model.

The test results showed that the variable X1 had a value of f^2 of 1.099 to Work Productivity (Y**).** This value is well above the limit of 0.35, which indicates that X1 has a very large effect on Work Productivity. Thus, the presence of the X1 variable in the model makes a very strong contribution to improving the model's ability to explain the variation in Work Productivity.

Meanwhile, the X2 variable has an f^2 value of 0.479 to Work Productivity (Y). This value also exceeds the limit of 0.35, so it can be categorized as a **large effect**. This shows that the X2 variable also makes a significant and substantial contribution in explaining changes in Work Productivity, although the effect is relatively small compared to the X1 variable.

Overall, the results of the f^2 test showed that both X1 and X2 had a strong influence on Work Productivity (Y). Thus, these two independent variables are important factors that need to be considered in increasing Work Productivity, as well as strengthening the feasibility of the structural model used in this study.

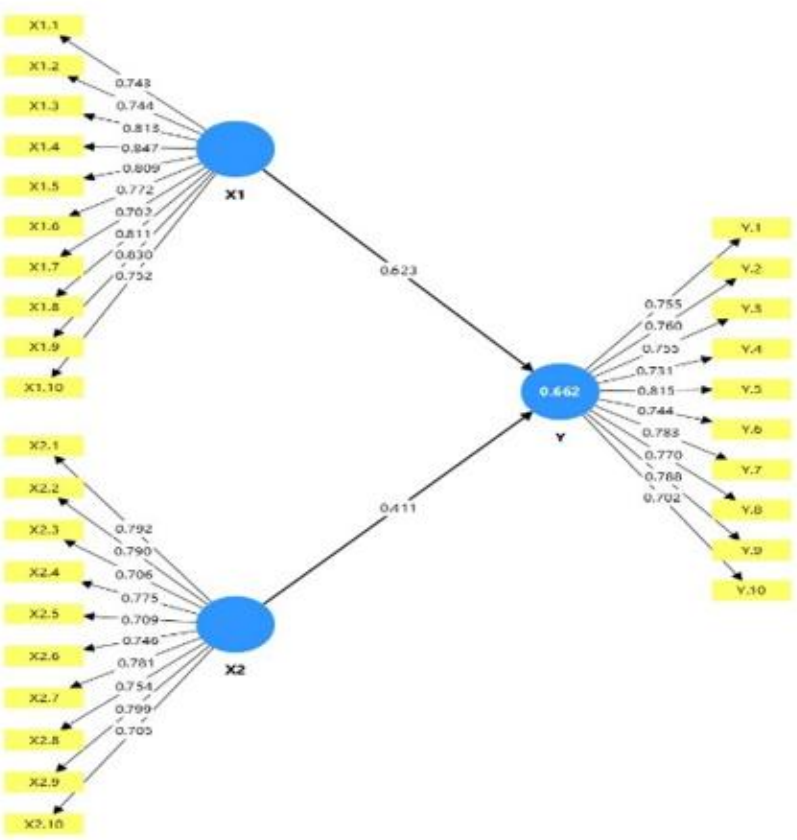

Figure 1. SEM-PLS measurement model

According to the structural model of data processing results using SmartPLS, the Digital Training variable has a path coefficient value of 0.623, while Digital Competency is 0.411. Both coefficient values have a positive value, which shows that both digital training and digital competencies have a positive effect on work productivity, with Digital Training as the more dominant variable.

Furthermore, the R-square (R^2) value in the Work Productivity (Y) variable was 0.662, which means that 66.2% of the variation in Work Productivity can be explained by Digital Training and Digital Competency together, while the remaining 33.8% was influenced by other variables outside the research model. Based on these values, the structural model in this study is categorized as strong and has good predictive ability to explain the relationship between the variables studied from employees at Bank Indonesia Cirebon.

Table 4. Hypothesis Analysis Results

	Original sample (O)	Sample mean (M)	Standard devitation (STDEV)	t Value	p Value
X1 -> Y	0.623	0.628	0.092	6.800	0.000
X2 -> Y	0.411	0.414	0.093	4.429	0.000

Based on the results of *the hypothesis analysis in Table 5*, all the relationships between variables examined in this study were proven to be statistically significant.

The results of the Hypothesis 1 (H1) test show that Digital Training (X1) has a positive and significant effect on Work Productivity (Y**).** This is shown by the path coefficient value of 0.623, which indicates a positive relationship with considerable influence power. The *t-statistic* value of 6.800 has exceeded the critical limit of 1.96, as well as *a p-value* of 0.000 which is smaller than 0.05. Thus, it can be concluded that the first hypothesis is accepted. These findings indicate that the better the implementation of digital training—both in terms of materials, methods, and technological relevance—the work productivity of Bank Indonesia Cirebon employees will increase. Digital training plays an important role in improving work efficiency, speed of adaptation to digital systems, and the quality of employee performance.

Furthermore, the results of the Hypothesis 2 (H2) test show that Digital Competence (X2) also has a positive and significant influence on Work Productivity (Y). This is evidenced by the path coefficient value of 0.411**, the** t-statistic *value* of 4.429**,** and *the p-value* of 0.000**.** A *t-statistic* value greater than 1.96 and *a p-value* below 0.05 indicates that the second hypothesis is accepted. These findings indicate that employees' ability to use digital technology, understand digital-based work systems, and manage information effectively contributes significantly to increasing work productivity. Employees with good digital competencies tend to be more adaptive, accurate, and efficient in completing job tasks.

Overall, the results of the hypothesis analysis show that Digital Training (X1) and Digital Competence (X2) both have a positive and significant effect on the Work Productivity (Y) of Bank Indonesia Cirebon employees. However, the value of the coefficient of the Digital Training pathway is greater than that of Digital Competence shows that digital training has a more dominant influence in increasing work productivity. This confirms that the organization's investment in structured and sustainable digital training programs is a key factor in supporting increased employee productivity in the era of digital transformation.

Some previous research supports the finding that digital training and digital competencies have a significant positive effect on employee work productivity, with training often showing stronger influences (Mayasari, Suhara, Marlita, Estiana, & Diani, 2024). These results are also in line with research by (Bards, 2025) in digital workplace employees in Indonesia which shows that learning and development programs, including digital training,

have the greatest significant positive influence on employee productivity compared to other variables.

Simultaneously, digital training and digital competencies together explain most of the variation in employee work productivity, which is reflected in the high value of the coefficient of determination (R^2) in the analysis model. This shows that an organization's efforts to increase productivity are not enough just by providing technology, but must be accompanied by a systematic training program as well as the development of individual digital competencies of employees (Al-owaidi, 2024). Digital training serves as a primary entry point that equips employees with basic knowledge and skills, while digital competencies reflect the extent to which employees are able to internalize and apply that knowledge in their day-to-day work. Thus, the dominance of the influence of digital training over digital competence in the empirical model can be understood as evidence that the quality and intensity of training are an important foundation for the formation of digital competence which ultimately leads to an increase in work productivity (Martini, 2025).

CONCLUSION

Based on the data analysis and discussion, several conclusions were drawn. First, digital training was proven to have a positive and significant effect on work productivity, with a path coefficient of 0.623 and a p-value of 0.000. These findings indicated that Bank Indonesia's investment in systematic, sustainable, and practically relevant digital training programs contributed significantly to improving work efficiency, employee adaptation to digital systems, and overall performance quality. Well-designed digital training enhanced employees' understanding of emerging technologies and developed the technical and soft skills required in the digital transformation era.

Second, employee digital competence also had a positive and significant effect on work productivity, with a path coefficient of 0.411 and a p-value of 0.000. This finding demonstrated that employees' ability to utilize digital technologies, understand digital-based work systems, and manage information effectively contributed substantially to increased work productivity. Employees with higher digital competence tended to be more adaptive, accurate, and efficient in completing daily work tasks.

Overall, the research model showed that digital training and digital competence jointly explained 66.2% of the variation in employee work productivity, while the remaining 33.8% was influenced by other factors not examined in this study. The R-squared value indicated that the research model had a moderate explanatory capability in describing the relationship among the variables.

The most significant finding was that digital training had a stronger influence than digital competence in improving work productivity. This highlights that the quality and intensity of training serve as important foundations for developing digital competence, which ultimately contributes to enhanced employee productivity. Digital training functions as an initial mechanism for providing employees with the knowledge and skills required to operate within digital work environments, while digital competence reflects employees' ability to internalize and apply those skills in daily activities. Therefore, organizational efforts to improve productivity should not only focus on providing digital technologies but also emphasize structured training programs and continuous development of employees' digital

competencies.

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