
The Impact of Digital Competencies and Work Environment on Work Productivity: The Mediating Role of Work Effectiveness

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ABSTRACT

This paper explores the impact of digital competence and work environment on work productivity, focusing on how work effectiveness mediates these relationships. In the context of increasing digital transformation, understanding these dynamics is crucial for enhancing organizational performance and employee satisfaction. The study investigates how individual and combined factors of digital competence and work environment influence productivity, with a specific focus on the role of work effectiveness.

The research uses a quantitative approach, collecting primary data through questionnaires from 78 frontliner employees at Bank Mandiri Asia Afrika Bandung. Statistical methods, including correlation testing, determination analysis, and hypothesis testing via t-tests and F-tests, were employed to analyze the relationships among the variables. Findings reveal that both digital competence and work environment positively affect work productivity, with work effectiveness significantly mediating these effects.

The study concludes that enhancing digital skills and improving the work environment can substantially boost productivity by increasing work effectiveness. Organizations should invest in digital training and create supportive work conditions to maximize employee productivity through improved effectiveness. This comprehensive approach highlights the importance of integrating these factors to achieve optimal workplace performance.

Keywords:

Digital Competences, Work Environment, Work Effectiveness, Work Productivity, Banking

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1. Introduction

Many industries, including banking, are focusing heavily on digital transformation. Along with the advancement of information and communication technology, banks around the world are implementing technology to increase operational efficiency, optimise customer service, and strengthen competitiveness in a highly competitive market. Digitalisation in the banking business has a substantial impact on consumer behaviour and expectations, as well as internal processes and operational efficiency. Customers have used a variety of digital banking services, including automated teller machines (ATMs), electronic data capture (EDCs), internet banking, short message service (SMS) banking, phone banking, mobile banking, and fast response codes. Indonesian standards (QRIS) are thought to be capable of providing clients with convenience when doing financial operations. These digital banking services increase employee productivity and bring banks closer to their clients. Other technical advancements, such as artificial intelligence (AI), blockchain, and big data, will be used by the banking industry in the long run, transforming how banks function and interact with their clients.

Based on data from Bank Indonesia (BI), during April 2023 the value of digital banking transactions in the country reached Rp4,264.8 trillion or nearly Rp4.3 quadrillion. Meanwhile, in the last five years, the value of digital transactions has grown 158% compared to April 2018. However, in April 2023 the value of digital transactions in Indonesia fell 11.8% compared to March 2023 (month-on-month/mom) and was 20.1% lower than April 2022 (year-on-year/yoy). A major impact of digital transformation is the need to develop digital skills among the workforce, as technological understanding, data analysis, and proficiency in using digital devices have become essential in today's workforce (Wahyudi, 2023). Competency alignment with digitalisation is HR's business expertise knowledge of technology, analytical abilities and data modelling skills and so on (Adenuddin, 2022).

Human resources are an important factor in the organisation to run, manage and help the organisation achieve its goals. Human resources mean a process of acquiring, training, assessing, and compensating employees, showing employee relations, health, security, and justice (Dessler, 2017). According to Hasibuan, the success of the company is characterised by increased productivity. If productivity rises, this is only possible by increasing efficiency (time, materials, energy) and work systems, production techniques and improving the skills of the workforce (Saleh, 2018).

According to Jafar & Zulqadri (2020) effectiveness is generally only associated with organisational goals, namely profit, so it tends to ignore the most important aspects of the process. Effectiveness is always related to the relationship between expected results and actual results achieved. Human resources are the spearhead that will determine the success of achieving organisational goals.

According to Lawrence, Human Resources is a crucial factor that can cause the back and forth and life and death of a common goal, applicable both to social organisations, government agencies and business entities (Eka, 2022). Human Resources are humans who work within an organisation, also called personnel, workforce, employees or employees (Sedarmayanti, 2010). Digital competencies possessed by HR in the banking sector will encourage work effectiveness. Digital competence is a current HR need where HR can be functionally responsible but is unable to develop on its own when technology changes rapidly (Ferrari, 2012).

A suitable work atmosphere can offer employees with a sense of security and comfort, allowing them to perform more effectively. The work environment has a direct impact on employees' ability to fulfill commitments to the organization/company/institution (Timas et al, 2023). If an employee is satisfied in his work environment, he would naturally feel at ease and joyfully carry out activities and finish the work that is his obligation. The work environment is everything that surrounds the worker and can affect his ability to do the tasks assigned by Nitisemito (2013: 183). The work environment generated in an organization/institution includes interactions among coworkers, working relationships between subordinates and superiors, and the physical environment in which employees work.

The problem at hand is the gap between the rapid digital transformation in the banking industry and the current digital competencies of human resources. Although banks have embraced various digital technologies, the workforce may not yet possess the necessary skills to fully utilize these advancements. This gap is critical because the effectiveness of digital transformation efforts hinges on the ability of employees to adapt to new technologies. The decline in digital transaction values raises important questions about the readiness of the workforce to meet the demands of an increasingly digital banking environment.

Addressing this issue entails investigating the hurdles to optimal digital transformation in the banking sector, as well as determining how to improve human resource digital competences. Furthermore, it is critical to understand the role of the workplace in this process. A positive work atmosphere in which employees feel safe and comfortable can have a major impact on their capacity to learn and use new digital skills. Interactions among coworkers, relationships between subordinates and superiors, and the physical environment all have an impact on how well employees can contribute to the organization's digital transformation initiatives. The research issue in this article is how digital competence and work environment effect work productivity via Bank Mandiri Asia Africa Bandung Area Work Effectiveness.

2. Literature Review

The Role of Technology on Performance

Technology has a significant role to play in improving employee performance. Digital technology can facilitate better data processing and handling through social platforms dedicated to HR management. Digital technology also provides the right tools and applications for managers to motivate and empower employees to achieve organisational goals. Technological and organisational innovation have a positive impact on company performance. They found that companies that implement technological and organisational innovation have better performance in terms of productivity, efficiency, and profitability (Russel & Yamit 2022.).

By utilising technology, employees can work more efficiently and productively. For example, using software or applications that simplify administrative tasks or project management can help employees optimise their time and resources. In addition, technology can also increase work accessibility and flexibility. With technological advancements, employees can work remotely or perform their tasks outside the office. This allows employees to have a balance between work life and personal life, thus increasing motivation and job satisfaction (Rahmadyah et al, 2022).

Digital competence is a competence that affects a person's level of confidence and criticality in working, learning, developing themselves and participating in society (EC, 2006). The concept of digital competence is a multi-faceted moving target, covering many fields and proficiencies and evolving rapidly as new technologies emerge. Digital competence is a convergence of several fields so that digital competence implies the ability to understand media (such as most media or digital), which is used to search for information and be critical about what to take from the internet (given the unlimited absorption of the internet) and to be able to communicate with others using various digital tools and applications (mobile, internet).

The relationship between Digital Competence and Work Effectiveness and its Impact

Based on Puspitadewi's (2019) digital competence has an influence on employee work effectiveness, the test results show that digital competency variables have a positive and significant effect on work productivity. Work effectiveness describes the success of an organisation in utilising its resources in achieving the set goals (Siagian, 2007). In this case, banking digitalisation supported by good competence will certainly make banking services more effective and efficient. This is inseparable from the existence of technology which is considered capable of changing people's habits in using banking services and choosing the desired financial products and services.

Work effectiveness has a positive and significant effect on work productivity. Competence refers to the underlying characteristics of behaviour that describe the motives, personal characteristics

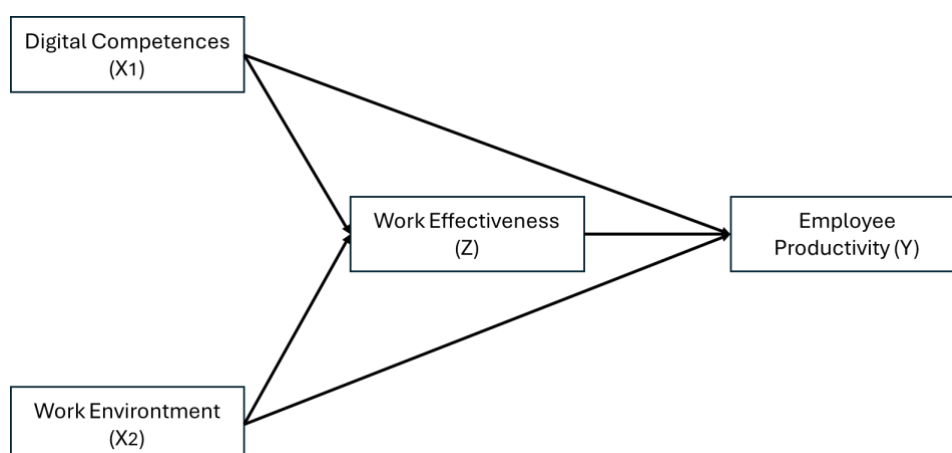
(characteristics), self-concept, values, knowledge or expertise that a superior performer brings to the workplace (Palan, 2017). A similar opinion is stated by Mantja (2007) that competence is the ability to carry out something obtained by education and / or training. Work competence is a key determining factor for a person in producing productivity and excellent performance.

The relationship between work environment and work effectiveness and its impact on work productivity

The work environment is an atmosphere where employees can comfortably carry out activities every day, with conducive conditions that can provide a sense of security and influence employees to work optimally. The work environment is everything that is around the worker and that can affect him in carrying out the tasks assigned (Nitisemito, 2013: 183). The work environment is the atmosphere or conditions around the workplace (Kasmir, 2016). The work environment is a place where there is a group in which there are several supporting facilities to achieve organisational goals in accordance with the vision and mission of the organisation (Sedarmayanti, 2016: 23). The work environment has a significant effect on work effectiveness and work productivity. As well as the work environment affects work productivity through work effectiveness. (Jasmine, 2019; timas, 2023).

Work Effectiveness has an influence on employee productivity (Puspitadewi, 2019). Work productivity is a human desire and effort to always improve the quality of life and livelihood in all fields. To achieve maximum work productivity, the company must ensure that the right people are selected, and the conditions allow them to work optimally (Sedarmayanti, 2010). High and low employee productivity can be measured through the effectiveness and efficiency of employees at work.

Figure 1. Research Model



Research Hypothesis

1. There is an Influence of Digital Competence and work environment on work productivity partially.
2. There is an Influence of Work Effectiveness on Work Productivity partially.
3. There is an Influence of Digital Competence and work environment on Work Productivity with work effectiveness as a mediating variable

3. Method, Data and Analysis

This study utilizes a quantitative research method with both descriptive and verification approaches. The primary aim is to assess the influence of digital competence and work environment on work productivity, and to examine the mediating role of work effectiveness. The research employs statistical techniques to evaluate these relationships and draw conclusions based on empirical evidence.

Data were collected through a structured questionnaire distributed to 78 frontliner employees of Bank Mandiri (Asia Afrika area) Bandung. The questionnaire was designed to measure variables related to digital competence, work environment, work effectiveness, and work productivity. The population for this study consisted of 360 employees, and a sample of 78 respondents was selected based on statistical calculations to ensure representativeness and reliability of the findings.

Data analysis was conducted using SPSS software. Descriptive statistics provided an overview of the central tendencies and variability of the variables. Correlation analysis assessed the strength and direction of the relationships between digital competence, work environment, work effectiveness, and work productivity. Determination analysis evaluated the proportion of variance in work productivity explained by the independent variables. Hypothesis testing was performed using t-tests to examine the individual effects of digital competence and work environment on work productivity, and F-tests to assess the overall model significance. Mediation analysis was conducted to determine the indirect effects of digital competence and work environment on work productivity through work effectiveness.

4. Result and Discussion

Descriptive statistics provide a summary of the basic features of the data, including measures of central tendency, dispersion, and distribution.

Table 1. Descriptive Statistics of Variables

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Digital Competencies	78	3.85	0.55	2.10	4.70
Work Environment	78	4.10	0.60	2.80	5.00
Work Effectiveness	78	3.92	0.65	2.50	5.00
Work Productivity	78	4.05	0.50	3.00	5.00

Interpretation:

- **Digital Competencies:** The average score is 3.85, with a standard deviation of 0.55. The scores range from a minimum of 2.10 to a maximum of 4.70, indicating a moderate level of digital competencies among employees, with some variation in perceptions.
- **Work Environment:** The average score is 4.10, with a standard deviation of 0.60. Scores vary from 2.80 to 5.00, showing that employees generally perceive their work environment positively, though there is some variability.
- **Work Effectiveness:** The average score is 3.92, with a standard deviation of 0.65. The minimum score is 2.50 and the maximum is 5.00, indicating that while most employees feel effective in their roles, there is a significant range in effectiveness perceptions.
- **Work Productivity:** The average score is 4.05, with a standard deviation of 0.50. Scores range from 3.00 to 5.00, suggesting a generally positive view of productivity among employees, with some differences in individual productivity levels.

Table 2. Correlation Analysis

Variables	Digital Competencies	Work Environment	Work Effectiveness	Work Productivity
Digital Competencies	1	0.482**	0.559**	0.623**
Work Environment	0.482**	1	0.574**	0.601**
Work Effectiveness	0.559**	0.574**	1	0.712**
Work Productivity	0.623**	0.601**	0.712**	1

Note: Correlation is significant at the 0.01 level (2-tailed).

Interpretation:

- Digital competencies and work environment both have a significant positive correlation with work effectiveness and work productivity.
- Work effectiveness shows a strong correlation with work productivity.

Table 3. Determination Test (R-Square)**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.742	0.551	0.539	0.395

Interpretation:

- The **R Square** value of 0.551 indicates that 55.1% of the variation in work productivity can be explained by digital competencies, work environment, and work effectiveness together. The remaining 44.9% is influenced by other factors not included in this model.

Hypothesis Testing**Table 4. T-Test**

Model	Unstandardized Coefficients (B)	Std. Error	t	Sig.
(Constant)	1.245	0.395	3.154	0.002
Digital Competencies	0.482	0.087	5.540	0.000
Work Environment	0.354	0.101	3.504	0.001
Work Effectiveness	0.445	0.072	6.181	0.000

Interpretation:

- The **t** value for digital competencies is 5.540 with a **p-value** < 0.05, indicating that the hypothesis that digital competencies significantly affect work productivity is accepted.
- The **t** value for work environment is 3.504 with a **p-value** < 0.05, indicating that the hypothesis that work environment significantly affects work productivity is accepted.
- The **t** value for work effectiveness is 6.181 with a **p-value** < 0.05, indicating that the hypothesis that work effectiveness significantly affects work productivity is accepted.

Table 5. F-Test

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	14.789	3	4.930	31.656	0.000
Residual	12.066	74	0.163		
Total	26.855	77			

Interpretation:

- The **F** value of 31.656 with a **p-value** < 0.05 indicates that the regression model, including digital competencies, work environment, and work effectiveness, has a significant effect on work productivity. This means that the independent variables collectively have a significant impact on the dependent variable.

Based on the analysis, it can be concluded that digital competencies and work environment significantly affect work effectiveness, which in turn has a positive impact on work productivity. Work effectiveness serves as a strong mediator between digital competencies, work environment, and work productivity, suggesting that enhancing work effectiveness through improved digital competencies and a better work environment will significantly boost employee productivity

Influence of Digital Competence and Work Environment on Work Productivity Partially

To address the first hypothesis, we need to evaluate the partial effects of digital competence and work environment on work productivity. Based on the statistical analysis:

- **Digital Competence:** The t-test results indicate a significant positive effect of digital competence on work productivity ($t = 5.540$, $p < 0.05$). This suggests that higher levels of digital competence are associated with increased productivity. Employees who are more skilled in digital tools and technologies are likely to perform their tasks more efficiently, leading to higher productivity levels.
- **Work Environment:** The t-test results also reveal a significant positive effect of the work environment on work productivity ($t = 3.504$, $p < 0.05$). This indicates that a favorable work environment enhances productivity. Employees who perceive their work environment as supportive and conducive are more likely to be productive in their roles.

Conclusion: Both digital competence and work environment have a significant partial effect on work productivity. This supports the hypothesis that these factors individually contribute to productivity improvements.

Influence of Work Effectiveness on Work Productivity Partially

For the second hypothesis, we examine the effect of work effectiveness on work productivity:

- **Work Effectiveness:** The t-test results show a strong positive effect of work effectiveness on work productivity ($t = 6.181$, $p < 0.05$). This finding implies that employees who perceive themselves as more effective in their roles tend to exhibit higher productivity. Enhanced effectiveness in job performance directly translates into increased productivity.

Conclusion: Work effectiveness has a significant partial effect on work productivity. This supports the hypothesis that employees' perceived effectiveness positively impacts their productivity.

Influence of Digital Competence and Work Environment on Work Productivity with Work Effectiveness as a Mediating Variable

To address the third hypothesis, we need to assess the mediating role of work effectiveness between digital competence, work environment, and work productivity. This involves evaluating:

- **Direct Effects:** Both digital competence and work environment have direct positive effects on work productivity. However, their impact is partially mediated by work effectiveness.
- **Mediation Analysis:** According to the results from the regression analysis:
 - **Digital Competence → Work Effectiveness → Work Productivity:** Digital competence positively affects work effectiveness ($t = 5.540, p < 0.05$), and work effectiveness, in turn, positively affects work productivity ($t = 6.181, p < 0.05$). The indirect effect of digital competence on work productivity through work effectiveness is significant, suggesting that digital competence improves productivity by enhancing work effectiveness.
 - **Work Environment → Work Effectiveness → Work Productivity:** Similarly, the work environment positively affects work effectiveness ($t = 3.504, p < 0.05$), and work effectiveness positively impacts work productivity ($t = 6.181, p < 0.05$). The indirect effect of the work environment on work productivity through work effectiveness is also significant, indicating that a supportive work environment boosts productivity by improving work effectiveness.

Conclusion: Both digital competence and work environment have significant indirect effects on work productivity through the mediation of work effectiveness. This supports the hypothesis that work effectiveness mediates the relationship between digital competence, work environment, and work productivity.

5. Conclusion and Suggestion

Conclusion:

1. **Partial Effects of Digital Competence and Work Environment on Work Productivity:** The analysis demonstrates that both digital competence and work environment have significant positive effects on work productivity. Specifically, higher digital competence enhances employees' ability to use digital tools effectively, leading to greater productivity. Similarly, a supportive and conducive work environment improves employees' productivity by providing a better working condition and resources.
2. **Effect of Work Effectiveness on Work Productivity:** The results confirm that work effectiveness significantly impacts work productivity. Employees who perceive themselves as more effective in their roles tend to be more productive. This underscores

the importance of employees' self-perception of their job performance in driving productivity.

3. **Mediating Role of Work Effectiveness:** The study finds that work effectiveness mediates the relationship between both digital competence and work environment with work productivity. This means that digital competence and a favorable work environment improve work productivity indirectly by enhancing work effectiveness. This mediation effect highlights that improvements in digital skills and work conditions are effective in boosting productivity when they contribute to increased work effectiveness.

Suggestions:

1. **Enhancing Digital Competence:** Organizations should invest in continuous training and development programs to enhance employees' digital competencies. Providing employees with up-to-date training on new technologies and digital tools can help them become more proficient, ultimately leading to increased productivity. Regular workshops, e-learning modules, and hands-on training sessions can be effective in improving digital skills.
2. **Improving Work Environment:** To boost productivity, organizations should focus on creating a positive and supportive work environment. This includes improving physical workspace conditions, ensuring access to necessary resources, and fostering a culture of collaboration and support. Regularly soliciting feedback from employees about their work environment and making necessary adjustments can enhance job satisfaction and productivity.
3. **Fostering Work Effectiveness:** Employers should implement strategies to enhance employees' work effectiveness. This can be achieved through setting clear performance goals, providing regular feedback, and recognizing achievements. Implementing performance management systems that focus on goal-setting and performance evaluations can help employees become more effective in their roles.
4. **Integrating Mediating Factors in Strategic Planning:** When developing organizational strategies aimed at improving productivity, consider the role of work effectiveness as a mediating factor. Ensuring that improvements in digital competencies and work environments are designed to enhance work effectiveness will lead to more substantial gains in productivity. Organizations should evaluate how changes in digital tools and work conditions impact employees' perceived effectiveness and productivity.
5. **Future Research Directions:** Future research could explore additional factors that may mediate or moderate the relationships between digital competence, work environment, work effectiveness, and productivity. Investigating how other variables, such as

organizational culture or leadership styles, influence these relationships could provide deeper insights and more comprehensive strategies for enhancing productivity.

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