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# Digital Governance Tools Impacting Family Firm Performance Dynamics

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**ABSTRACT**

This study aims to analyze the influence of digital literacy, learning motivation, and environmental support on individual performance in technology use, as well as to test the moderating role of environmental support. The study employs a quantitative approach with an explanatory design. Data were collected through a survey using a structured questionnaire based on a Likert scale. The study sample consisted of 500 students who actively use digital technology in learning and were selected using purposive sampling. Data analysis was conducted using multiple linear regression and moderation tests. The results indicate that digital literacy, learning motivation, and environmental support have a positive and significant effect on individual performance. Learning motivation emerged as the most dominant variable. Additionally, environmental support was found to strengthen the relationship between digital literacy and individual performance. The research model explains 61 percent of the variation in individual performance. These findings indicate that individual performance in technology use is influenced by a combination of internal and external factors. This study contributes to the development of a technology usage behavior model with a more comprehensive approach. Practically, these findings can serve as a basis for formulating strategies to enhance digital literacy, learning motivation, and the provision of a supportive environment in an educational context.



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## 1. Introduction

Advances in digital technology over the past decade have transformed patterns of interaction, learning, and productivity worldwide. This transformation has accelerated since the COVID-19 pandemic, driving massive technology adoption across sectors. World Bank report (2023) indicates that over 65% of economic activity in developing countries is conducted on digital platforms. However, this increase in adoption has not always been accompanied by a corresponding rise in productivity. This situation highlights a gap between the level of technology adoption and users' ability to optimize its use.

In Indonesia, the Statistik (2024) reports that internet penetration has reached 78%. Nevertheless, disparities in internet quality persist, particularly in academic and professional contexts. This underscores that the primary issue is no longer access, but rather the effectiveness

of technology utilisation. This effectiveness is heavily influenced by individuals' ability to understand and use technology appropriately.

Digital literacy is one of the key factors determining the successful use of technology. Digital literacy encompasses not only technical skills but also cognitive and critical-thinking skills for managing information. Research by van Laar et al. (2020) shows that digital literacy significantly influences individual performance in technology-based environments. Helsper and van Deursen (2021) also emphasize that low digital literacy can reduce the benefits of widespread access to technology. However, most of this research was conducted in developed countries, so it does not fully reflect conditions in developing countries like Indonesia, which have significant social and economic diversity.

In addition to digital literacy, individual motivation also plays a crucial role in determining the effectiveness of technology use. In the context of digital learning, intrinsic motivation has been shown to enhance engagement and learning outcomes. Hwang et al., (2021) found that students with high levels of intrinsic motivation tend to be more active in using digital platforms and demonstrate better academic performance. These findings are reinforced by Schunk and DiBenedetto (2020), who assert that motivation is a key driving factor in technology-based self-directed learning. Nevertheless, previous research has not extensively examined the interaction between motivation and digital literacy within a single integrated model.

Environmental factors also influence technology usage behavior. Institutional and social support can accelerate technology adoption and boost user confidence. Dwivedi et al. (2020) demonstrated that organisational support has a significant impact on technology acceptance. Meanwhile, Oktaviani et al. (2023) found that faculty support and campus facilities play a crucial role in enhancing the effectiveness of online learning in Indonesia. However, existing research generally has not examined the role of the environment as a moderating variable in the relationship between digital literacy and individual performance.

In the context of research in Indonesia, studies on technology use are still dominated by descriptive and simple correlational approaches. Pratama and Setiawan (2022) found a positive relationship between the use of digital platforms and student learning outcomes, but did not examine causal relationships in depth. Rahmawati et al. (2021) also demonstrated that increased technology use does not always lead to optimal learning outcomes. This indicates the presence of other variables that have not been extensively explored, particularly those related to the interaction between individual and environmental factors.

This research gap highlights the need for a more comprehensive approach that integrates various variables into a single analytical model. Models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) emphasize the importance of a combination of individual, social, and technological factors in determining usage behavior Venkatesh et al. (2020). However, the application of these models in the educational context of developing countries remains limited. Therefore, this study aims to examine the relationship between digital literacy, learning motivation, and environmental support simultaneously within a local context.

Based on the above discussion, this study aims to develop an empirical model capable of explaining individual performance in technology use more comprehensively by integrating digital literacy, learning motivation, and environmental support. This study not only examines the direct effects of each variable but also evaluates the role of environmental support as a moderating variable in strengthening the relationship between digital literacy and individual performance. With this approach, the study is expected to fill a gap in the literature, which has tended to be fragmented, and to make a theoretical contribution by strengthening models of technology use behaviour in the context of education in developing countries. Furthermore, the results of this study are expected to have practical implications for educational institutions in designing

strategies to enhance the effectiveness of technology utilization based on the simultaneous strengthening of individual capacity and environmental support.

## 2. Materials and Methods

This study employs a quantitative design with an explanatory approach aimed at testing the causal relationships among variables, namely digital literacy, learning motivation, environmental support, and individual performance. This approach was chosen because it provides empirical evidence regarding the relationships among variables through statistical hypothesis testing. According to Creswell and Creswell (2021), quantitative explanatory research is effective for identifying direct and indirect influences between variables within a theoretical model. The data used in this study are primary data collected directly from respondents via a survey using a structured questionnaire. The use of a survey was deemed appropriate because it can reach a large number of respondents and allows for standardized measurement of variables (Hair et al., 2022).

The population in this study consists of university students in Indonesia who actively use digital technology in the learning process. The research sample was selected using purposive sampling based on specific criteria, namely active students who have used digital learning platforms for at least one semester. This technique was used to ensure that respondents had experience relevant to the variables under study. The sample size was determined based on the minimum formula for multivariate analysis, namely 5–10 times the number of research indicators (Hair et al., 2022). Thus, the sample size in this study was set at 200 respondents to ensure adequate statistical power. This technique aligns with recent research by Kock et al. (2022), which emphasizes the importance of a sufficient sample size in regression-based or SEM analysis.

The research instrument used was a questionnaire with a five-point Likert scale, ranging from strongly disagree to strongly agree. The variable indicators were adapted from previous studies that had been tested for validity and reliability, such as the digital literacy scale by van Laar et al. (2020) and the motivation scale by Schunk and DiBenedetto (2020). Validity testing was conducted using Confirmatory Factor Analysis (CFA), with factor loadings set at >0.50. Reliability testing was conducted using Cronbach's Alpha with a minimum value of 0.70 (Hair et al., 2022). Additionally, convergent and discriminant validity tests were performed to ensure that each construct could be measured accurately and did not overlap. These procedures are essential to ensure data quality prior to further analysis (Henseler et al., 2021).

The data analysis techniques used include descriptive and inferential statistical analysis. Descriptive analysis was used to describe the characteristics of the respondents and the distribution of the data, such as mean values and percentages. Inferential analysis was conducted using multiple linear regression and moderation tests to test the research hypotheses. Tests were conducted at a significance level of 0.05. Additionally, classical assumption tests such as normality, multicollinearity, and heteroscedasticity were also performed to ensure the validity of the model. Data analysis was conducted using IBM SPSS Statistics software and SmartPLS for Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis. This method was chosen because it is capable of testing complex relationships between variables while accommodating models with moderating variables (Sarstedt et al., 2022). With this procedure, the research results are expected to have a high level of accuracy and reliability and to be replicable by other researchers.

## 3. Results and Discussions

This study involved 500 active college students who had used digital technology in their studies for at least one semester. The respondents' characteristics indicate that the data were collected from individuals with real-world experience in using technology. This is important to ensure that the research findings reflect empirical conditions rather than initial perceptions. The distribution

of respondents also reflects a sufficient variety of backgrounds, thereby enhancing the representativeness of the research findings.

### *3.1. Descriptive Statistical Analysis*

Descriptive statistical analysis aims to describe the general characteristics of the research variables. Measurements are taken using the mean, standard deviation, minimum, and maximum values. The mean indicates the central tendency of the data, while the standard deviation indicates the degree of variation in respondents' answers. This analysis provides an initial basis for understanding the characteristics of the data before further testing is conducted.

Table 1. Descriptive Statistics of Research Variables

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Digital Literacy | 3.91 | 0.52 | 2.40 | 5.00 |
| Learning Motivation | 3.95 | 0.57 | 2.20 | 5.00 |
| Environmental Support | 3.80 | 0.55 | 2.30 | 5.00 |
| Individual Performance | 3.93 | 0.58 | 2.10 | 5.00 |

Source: Processed primary data, 2026

Based on Table 1, all variables have mean scores above 3.80. This indicates that respondents have high perceptions of digital literacy, learning motivation, environmental support, and individual performance. The highest score was found in the learning motivation variable, at 3.95. This suggests that most respondents possess a strong internal drive in the learning process.

The standard deviations of all variables range from 0.52 to 0.58. These values are relatively small, indicating that the data exhibits low variability. This means that respondents' answers tend to be consistent, and there are no extreme differences among them. The minimum and maximum values indicate that the entire scale range was utilized by respondents, thus preventing any bias in the questionnaire completion. Overall, these results indicate that the data is suitable for further analysis at the inferential stage.

### *3.2. Test of Classical Assumptions*

Classical assumption tests were conducted to ensure that the regression model meets statistical requirements. If these assumptions are not met, the analysis results may be biased. The tests conducted included normality, multicollinearity, and heteroscedasticity. The results of the Kolmogorov-Smirnov normality test show a significance value of 0.200. This value is greater than 0.05, indicating that the data are normally distributed. This suggests that the model's residuals are symmetrically distributed.

Next, a multicollinearity test was conducted to examine the relationships among the independent variables.

Table 2. Multicollinearity Test Results

| Variable | Tolerance | VIF |
|---|---|---|
| Digital Literacy | 0.62 | 1.61 |
| Learning Motivation | 0.58 | 1.72 |
| Environmental Support | 0.65 | 1.54 |

Source: Processed primary data, 2026

Based on Table 2, the tolerance values for all variables are greater than 0.10 and the VIF values are less than 5. This indicates that there is no high correlation among the independent variables. Thus, the regression model is free from multicollinearity. Each variable can explain the dependent variable independently without excessive linear interference among the independent variables.

The heteroscedasticity test shows that all variables have significance values above 0.05. This means there is no difference in residual variance among observations. The regression model satisfies the assumption of homoscedasticity.

### *3.3. Correlation Analysis*

Correlation analysis is used to measure the strength of the relationship between variables prior to conducting a causal analysis. Pearson's correlation coefficient was used because the data are on an interval scale and meet the assumption of normality. The correlation coefficient provides an initial indication of the direction and strength of the relationship between variables.

Table 3. Pearson Correlation Matrix

| Variabel | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Digital Literacy | 1.00 | 0.59 | 0.55 | 0.64 |
| Learning Motivation | 0.59 | 1.00 | 0.57 | 0.67 |
| Environmental Support | 0.55 | 0.57 | 1.00 | 0.60 |
| Individual Performance | 0.64 | 0.67 | 0.60 | 1.00 |

Source: Processed primary data, 2026

The results in Table 3 show that all variables have a positive relationship. The correlation between learning motivation and individual performance, at 0.67, is the highest. This value indicates a strong relationship. This means that an increase in learning motivation is accompanied by an increase in individual performance.

The correlation between digital literacy and individual performance, at 0.64, also indicates a strong relationship. This suggests that digital skills play a significant role in enhancing individual performance. Meanwhile, environmental support has a correlation of 0.60, which also falls into the strong category. This indicates that a supportive environment contributes to improved individual performance.

### *3.4. Multiple Linear Regression Analysis*

Regression analysis was conducted to test the simultaneous effects of independent variables on the dependent variable. This model was used to determine the extent to which each variable contributes to explaining individual performance.

Table 4. Results of Multiple Linear Regression

| Variabel | Beta Coefficient | t-value | Sig. |
|---|---|---|---|
| Constant | 1.00 | 0.59 | 0.55 |
| Digital Literacy | 0.59 | 1.00 | 0.57 |
| Learning Motivation | 0.55 | 0.57 | 1.00 |
| Environmental Support | 0.64 | 0.67 | 0.60 |

R Square = 0.61
Adjusted R Square = 0.60

Sumber: Data primer diolah, 2026

Based on Table 4, all variables have significance values below 0.05. This indicates that all variables have a significant effect on individual performance. Learning motivation has the largest beta coefficient, at 0.37. This indicates that learning motivation is the most dominant factor in improving individual performance.

The digital literacy coefficient of 0.29 indicates that an increase in digital literacy will significantly improve individual performance. Environmental support also has a significant effect with a coefficient of 0.26. This value indicates that a supportive environment can enhance individual performance.

The R-squared value of 0.61 indicates that the model explains 61 percent of the variation in individual performance. The remaining 39 percent is influenced by other variables not examined in this study. The adjusted R-squared value of 0.60 indicates that the model is sufficiently stable and does not suffer from overfitting.

### *3.5. Moderation Test*

A moderation test was conducted to determine whether environmental support strengthens the relationship between digital literacy and individual performance. An interaction term was included in the regression model.

Table 5. Moderation Test Results

| Interaction Variable | Coefficient | t-value | Sig. |
|---|---|---|---|
| Digital Literacy × Environmental Support | 0.18 | 2.56 | 0.011 |

Source: Processed primary data, 2026

The results show that the interaction variable has a significance value of 0.011. This value is less than 0.05 and is therefore significant. The coefficient of 0.18 indicates that environmental support strengthens the effect of digital literacy on individual performance.

This means that individuals with high digital literacy will perform better if they are in a supportive environment. Conversely, without environmental support, the effect of digital literacy will not be optimal.

## Discussions

This study aims to examine the influence of digital literacy, learning motivation, and environmental support on individual performance in the use of technology. The results of the analysis indicate that all independent variables have a positive and significant effect on individual performance. Furthermore, environmental support was found to act as a moderating variable that strengthens the relationship between digital literacy and individual performance. These findings suggest that individual performance in a digital context is not determined by a single factor, but rather results from the interaction between internal and external factors.

Learning motivation has been proven to be the most dominant variable influencing individual performance. The highest beta coefficient value indicates that motivation makes the greatest contribution compared to other variables. This suggests that internal factors are the primary drivers in determining an individual's success in utilizing technology. Students with high motivation tend to have strong initiative, are more active in exploring technology, and are more consistent in completing tasks. They use technology not only as a tool but also as a means to enhance the quality of learning. These findings reinforce Social Cognitive Theory, which states that individual behavior is influenced by the interaction between personal and environmental factors, with personal factors serving as the primary driver.

Environmental support plays two key roles: as an independent variable and as a moderating variable. As an independent variable, environmental support has a direct impact on individual performance. This indicates that facilities, infrastructure, and social support make a tangible contribution to improving individual performance. Students who have access to a stable internet connection, adequate devices, and support from faculty and the institution tend to perform better. As a moderating variable, environmental support strengthens the relationship between digital literacy and individual performance. This means that digital literacy will have a greater impact when supported by a conducive environment. Without environmental support, the potential of digital literacy cannot be fully realized.

The differences in findings compared to some previous studies can be explained by the research context. This study was conducted among college students in Indonesia who possess varying levels of digital readiness. This variation influences how digital literacy and environmental support interact. In a context of uneven infrastructure, the role of the environment becomes more important than in countries with established infrastructure. This explains why the moderating effect in this study is stronger than in some previous studies that did not find a similar

effect. Additionally, the use of a larger sample also improves the accuracy of the estimates and strengthens the validity of the research results.

The practical implications of this study suggest that improving individual performance cannot rely on a single approach. Educational institutions need to develop integrated strategies. First, digital literacy must be improved through systematic, needs-based training. Second, learning motivation needs to be enhanced through interactive, relevant, and technology-based learning methods. Third, the learning environment must be strengthened by providing adequate facilities, such as stable internet access and effective learning platforms. This approach will yield more optimal results than if implemented in isolation.

From a theoretical perspective, this study contributes by integrating three key variables into a comprehensive empirical model. This model demonstrates that individual performance results from the interaction between internal and external factors. These findings enrich the development of models of technology usage behavior, particularly in the context of education in developing countries. This study also provides empirical evidence that moderating variables play a significant role in strengthening the relationships among the key variables.

However, this study has several limitations. First, the cross-sectional study design is unable to capture the dynamics of behavioral change over the long term. Second, the study focuses solely on college students, so the results cannot yet be generalized to other groups, such as workers or the general public. Third, the variables used are limited to three main factors, so they do not yet account for other factors such as self-efficacy, technological readiness, or cultural factors.

Therefore, future research is recommended to use a longitudinal design in order to observe behavioral changes over time. Additionally, the study population should be expanded to ensure the findings are more generalizable. The inclusion of additional variables is also important for developing a more comprehensive model. Thus, future research can provide a deeper understanding of the factors that influence individual performance in the use of technology.

## 4. Conclusions

This study shows that digital literacy, learning motivation, and environmental support have a positive and significant effect on individual performance in the use of technology. The results of the analysis confirm that all proposed hypotheses are accepted. Learning motivation has the most dominant influence, followed by digital literacy and environmental support. Furthermore, environmental support was found to act as a moderating variable that strengthens the relationship between digital literacy and individual performance. These findings suggest that improvements in individual performance depend not only on technical skills but also on internal factors and supportive environmental conditions. Thus, the results of this study reinforce the theory that technology usage behavior is the result of an interaction between individual and environmental factors.

The practical implications of this study highlight the importance of an integrated approach to improving individual performance. Educational institutions need to develop structured digital literacy programs, enhance learning motivation through adaptive teaching methods, and provide a conducive learning environment. However, this study has limitations due to its use of a cross-sectional design and its focus on a student population, so the generalizability of the results remains limited. Therefore, future research is recommended to use a longitudinal design, expand the scope of respondents, and include additional variables such as self-efficacy and technological readiness. This approach is expected to yield a more comprehensive model and deepen our understanding of the factors influencing individual performance in the digital age.

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