

# EMPOWERING MINDS: UNRAVELING THE IMPACT OF INFORMATION TECHNOLOGY AND TECHNOLOGICAL INTEGRATION IN ACADEMIC ENVIRONMENTS ON LEARNING OUTCOMES

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**Abstract** - Information technology has played an important role in the transformation of education, and its use is increasingly widespread in academia. However, it still needs to be investigated how the effective use of information technology can affect student learning outcomes. This study aims to investigate the influence of information technology and the use of technology in the higher education environment on learning outcomes. This study uses a quantitative method by collecting data from students in the college environment. Use of information technology is measured using a Likert scale of 1 to 5 points. There were a number of respondents in this study, namely 100 accounting students who had attended an information technology management course. Data analysis was performed using a linear regression technique to examine the effect of the independent variables (use of information technology and use of technology in academic environments) and the dependent variable (learning outcomes). The results of this study indicate that there is a significant influence between the use of information technology and the use of technology in the higher education environment on learning outcomes. The more frequently and effectively information technology is used in teaching and learning activities, the higher student learning outcomes.

**Keywords:** information technology, use of technology, learning outcomes.

## INTRODUCTION

In today's digital era, information technology has changed many aspects of life, including in the academic environment. The use of information technology in the educational context has had a significant impact on student learning outcomes. Research on the influence of information technology and its use in the academic environment on learning outcomes is an interesting and relevant topic for research (Bawaneh, 2011).

The use of information technology in the academic environment covers a wide range of aspects including the use of hardware such as computers, laptops and mobile devices, as well as software, applications and online learning platforms. In this digital era, information technology has opened up opportunities for wider access to learning resources, which include up-to-date and reliable educational materials. In addition, information technology also expands the scope of learning by allowing students to access and participate in distance learning programs, online courses, and various learning resources that can be accessed flexibly. Besides providing broad access, information technology also enhances the interaction between students and learning materials. With interactive features such as discussion forums, online collaboration, and digital learning tools, students can actively interact with learning materials and fellow students. This provides opportunities for the exchange of ideas, in-depth discussions, and collaborative learning that promotes better understanding (Guney, 2009).

Utilization of information technology can also increase the efficiency and effectiveness of the learning process, for example, students can access learning materials online anytime and anywhere, communicate with lecturers and fellow students through online platforms, and utilize digital resources, such as e-books, videos, learning, and interactive simulation. In addition, information technology also allows for more flexible online testing and assessment (Husein, 2014).

The influence of information technology and its use in the academic environment on learning outcomes is a major concern. Many studies have been conducted to reveal the relationship between the use of information technology and student academic achievement. Several studies have shown a positive relationship between the use of information technology and increased learning outcomes, while other studies have highlighted the challenges and problems that arise with the use of information technology in academic environments (Khan, 2009).

The purpose of this study was to analyze and evaluate the effect of information technology and its use in the academic environment on student learning outcomes. In this study, a review of the relevant literature will be carried out, including previous studies that have been conducted in this field. In addition, this research will also involve collecting primary data through surveys or interviews with students and lecturers who use information technology in the learning process.

By understanding the influence of information technology and its use in the academic environment on learning outcomes, it is hoped that appropriate recommendations and strategies can be found to increase the effective use of information technology in education. This research can also provide additional insights for educational institutions and policy makers in designing learning programs that integrate information technology well to improve student learning outcomes.

## RESEARCH METHODS

This study examines the impact of the use of information technology and the utilization of information systems on student academic achievement in the lecture process. This study uses a media questionnaire that is distributed via google form. The questionnaire was measured using a Likert scale of 5 (five) points. The number of respondents in this study were 100 students. Then it is processed using multiple linear regression analysis.

Information technology is a good way to improve student academic performance. Information technology makes it easier for students to get the information they need (Bowling, 2015). Information technology indicators according to Sutarman (2009) are 1) hardware (hardware); 2) software (software); 3) database (network and communication facilities); 4) Network (database); 5) People.

Utilization of information technology is to increase operational efficiency and optimize processes that can provide tasks or behavior in using technology when doing work (Aisiyah & Noorbaity, 2011). The use of information technology in learning aims to accommodate the overall use of the senses and students both audio, visual and audio visual (Rusman, 2011). Information technology benefit indicators according to 1) access; 2) outputs; 3) impact.

Learning outcomes according to Sumadi (2006) are results achieved from an exercise and experience that must be supported by awareness. Nugraha (2015) learning outcomes are the context of learning in the achievement of an educational taxonomy with the effort that makes someone successful is to carry out sustainable activities. That is, once a person realizes his potential in a field, he will continue to try to develop it in a primary capacity. Indicators of learning outcomes according to Bloom (1956) are 1) cognitive aspects; (2) affective aspects; and (3) psychomotor aspects.

## RESULTS AND DISCUSSIONS

Validity of instrument measurements refers to their ability to accurately capture the intended constructs as desired by the researcher. In this particular study, all the items pertaining to information technology, use of technology, and learning outcomes exhibited a positive correlation coefficient. This indicates that the collected data is valid and suitable for further analysis and testing.

Reliability, in addition to validity, is another crucial aspect of measuring variables. A variable is considered reliable if it obtains an alpha value of 0.6 or higher. The Cronbach's alpha value, presented in Table 1, for to information technology, use of technology, and learning outcomes variables demonstrates that the questionnaire instruments employed in this study exhibit good reliability.

Table 1  
Reliability test results

No	Variables	Cronbach's Alpha	Status
1	Information technology (X.1)	0.761	Reliable
2	Use of technology (X.2)	0.82	Reliable
3	Learning outcomes (Y)	0.768	Reliable

Source: SPSS Output

A regression model is considered effective when the data it analyzes aligns with the normal distribution on the diagonal axis of a normal distribution graph. To determine if the data meets the assumption of normality, a normal P-Plot graph is used as a reference to make decisions. After analyzing the data in Figure 1, it can be inferred that the normality assumption is satisfied.

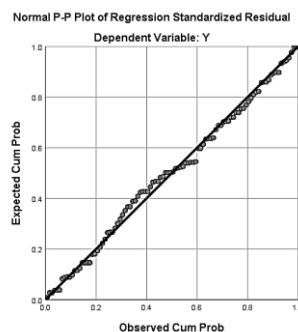


Figure 1. Normality Test  
Source: SPSS Output

A good regression model is characterized by homoscedasticity, that is, the absence of heteroscedasticity. this study shows that the data does not experience heteroscedasticity.

The Durbin-Watson method is employed to assess whether there is any autocorrelation present in the regression model. It utilizes a range of values from -2 to 2. Upon analyzing the data, a Durbin Watson value of 1.814 is obtained, indicating the absence of autocorrelation issues within this regression model. This finding is consistent with the results obtained from the Durbin Watson approach. Additionally, Table 2 displays the outcomes of the multiple linear regression analysis and the t test. The t test is primarily employed to determine the degree to which each independent variable can individually explain the variability observed in the dependent variable.

Table 2  
Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.074	1.846		4.916	.000
	X.1	2.349	.367	.451	6.392	.000
	X.2	2.164	.322	.475	6.729	.000

Source: SPSS Output

Based on Table 2, we can express the regression equation as follows: Y equals 9.074 plus 2.349 times X1 plus 2.164 times X2. The constant value of 22.331 indicates that when the values of financial literacy and risk tolerance are both zero, the investment decision will have a value of 9.074. The financial literacy variable exhibits a t-count value of 8.233 with a significance level of 0.000, which is less than 0.05. This indicates that financial literacy significantly affects students' individual investment decisions. The risk tolerance variable shows a t-count value of 6.729 with a significance level of 0.000, which is also less than 0.05. This demonstrates that risk tolerance significantly influences the individual investment decisions of students. Additionally, the simultaneous test results are presented in Table 3. If the probability (sig F) is less than 0.05, it indicates a significant influence of the independent variable on the dependent variable.

Table 3  
ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2365.380	2	1182.690	99.514	.000 <sup>b</sup>
	Residual	1152.810	97	11.885		
	Total	3518.190	99			

Source: SPSS Output

According to the findings presented in Table 3, the data reveals that both financial literacy and risk tolerance significantly impact students' investment decisions, with an F-count value of 99.514 and a significance level of 0.000. Since the significance level is lower than the predetermined threshold of  $\alpha=0.05$ , it can be concluded that financial literacy and risk tolerance collectively influence students' investment decisions. Additionally, to assess the extent to which the model explains the variability in the dependent variable, the coefficient of determination (R square) is employed. The results of the coefficient of determination calculation in this study are provided in Table 4 as follows:

Table 4  
Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.820 <sup>a</sup>	.672	.666	3.44741	1.814

Source: SPSS Output

According to the data presented in Table 4, it is evident that the R square value is 0.672. This finding indicates that 67.2% of the changes observed in student investment choices can be accounted for by the variables of financial literacy and risk tolerance, which were examined in this research. The remaining 32.8% is attributable to unidentified factors that were not explored in this particular study.

The research findings have unequivocally demonstrated that information technology plays a pivotal role in shaping learning outcomes. These findings align seamlessly with the research conducted by Ayunthara (2016), Hassan et al. (2019), and Nursyam, A. (2019), which emphasize the criticality of integrating technology into the learning and reading processes to amplify the magnitude of its impact on students' academic achievements. Moreover, it is crucial to recognize that students' academic performance is significantly influenced by both their learning motivation and the experiential factors intertwined within the learning process. With the ease and promptness that information technology offers, learners can readily access the indispensable information necessary for educational purposes. This unfettered accessibility not only provides convenience but also paves the way for swift resolutions to educational quandaries.

By conducting meticulous data analysis, this comprehensive study unveils a compelling and statistically significant correlation between the utilization of information technology and improved learning outcomes. These remarkable findings align seamlessly with the groundbreaking research conducted by the esteemed panel of Patria and Kristianus (2010), Munadi (2013), and Furqon (2018). Their seminal work sheds light on the diverse range of features provided by social networks, fostering seamless interaction and collaboration among users. Upon closer examination, these multifaceted features exhibit immense potential as dynamic and robust learning mediums, effectively enhancing the overall effectiveness and efficiency of the learning process. The integration of technology in education enables students to engage with interactive learning materials, access a wealth of educational resources, and collaborate with peers in real-time. The seamless interaction facilitated by social networks promotes active participation, knowledge sharing, and critical thinking, ultimately leading to improved learning outcomes. Furthermore, the utilization of information technology offers personalized learning experiences tailored to individual student needs and learning styles. Adaptive learning platforms and intelligent educational tools leverage data-driven insights to provide targeted instruction and support, addressing students' unique strengths and areas of improvement. This personalized approach enhances engagement, motivation, and knowledge retention, ultimately contributing to more favorable learning outcomes.

The implications of these findings are profound. Educational institutions and policymakers should recognize the transformative potential of information technology and invest in robust infrastructure, professional development, and curriculum integration to harness its full benefits. By embracing technology-enabled learning environments and fostering a culture of innovation, educators can create dynamic and inclusive educational experiences that empower students to thrive in the digital age.

## CONCLUSIONS

The purpose of this study is to obtain empirical evidence about the influence of information technology and the use of information technology on the learning process and its impact on student academic learning outcomes. Based on empirical results and data analysis, this study produces two conclusions, namely: First, the use of information technology can have a significant effect on student academic achievement. Furthermore, the use of technology provides flexibility for students to search for data and information and download the required class materials. The development of websites, blogs, e-mails and social networks expands the communication network between lecturers and students, as well as among peers. Technology can have a positive impact on student academic performance when handled properly. Based on the conclusions obtained, the suggestions that the researchers give are the form of efforts made by the university in order to optimize the use of information and communication technology in learning by providing motivation by utilizing information and communication technology in learning as well as various trainings and workshops both organized by parties school independently or from outside the school.

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