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The Influence of the Application of Information Technology on Student Performance in Academic Activities at Indonesian Higher Education Institutions

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Abstrak. *The development of information technology has significantly transformed higher education, particularly in facilitating access to information, academic communication, and online learning systems. This study aims to examine the influence of information technology implementation on student academic performance in Indonesian universities. Using a quantitative approach with a correlational survey method, data were collected from 47 student respondents through a Likert-scale questionnaire. The analysis techniques applied were simple linear regression and partial t-test using SPSS version 29. The results showed that the application of information technology had a positive and significant effect on student performance, with a coefficient of determination (R^2) of 0.679 and t-test significance value of < 0.001. these findings confirm that optimal utilization of technology can enhance the effectiveness and quality of students' academic outcomes. Therefore, higher education institutions are encouraged to strengthen digital literacy and technology infrastructure as part of their strategy to improve learning quality.*
Keywords: *Information Technology, Performance, Students, Learning*

Abstrak. Perkembangan teknologi informasi telah mengubah lanskap pendidikan tinggi secara signifikan, terutama dalam mendukung akses informasi, komunikasi akademikk, dan sistem pembelajaran daring. Penelitian ini bertujuan untuk menguji pengaruh penerapan teknologi informasi terhadap kinerja mahasiswa dalam kegiatan akademik di perguruan tinggi Indonesia. Menggunakan pendekatan kuantitatif dengan metode survei korelasional, data diperoleh dari 47 responden mahasiswa melalui kuesioner skala Likert. Teknik analisis yang digunakan adalah regresi linear sederhana dan uji t parsial dengan bantuan SPSS versi 29. Hasil penelitian menunjukkan bahwa penerapan teknologi informasi berpengaruh secara positif dan signifikan terhadap kinerja mahasiswa, dengan nilai koefisien determinasi (R2) sebesar 0,679 dan signifikansi uji t < 0,001. Temuan ini mempertegas bahwa pemanfaatan teknologi yang optimal dapat meningkatkan efektivitas dan kualitas capaian akademik mahasiswa. Oleh karena itu, perguruan tinggi perlu memperkuat literasi digital dan infrastuktur teknologi sebagai bagian dari strategi peningkatan mutu pembelajaran.
Kata Kunci: Teknologi Informasi, Kinerja, Mahasiswa, Pembelajaran

INTRODUCTION

The development of information and communication technology has had a significant impact on the transformation of higher education. The use of technology not only facilitates access to information and communication but also serves as a primary support in the implementation of the teaching and learning process, especially since the era of digitalization has strengthened. Technology has now become an inseparable part of students' academic activities, from access to lecture materials, interaction with lecturers, to the learning evaluation system (Mulyasa, 2022).

In the higher education environment, the application of information technology is manifested in various forms, such as the use of Learning Management Systems (LMS), video

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conference platforms (Zoom, Google Meet), task management applications (Google Classroom, Microsoft Teams), and online academic systems for course administration. Through these media, students can access course materials more flexibly and complete assignments efficiently. Higher education institutions can also monitor attendance, participation, and students' academic achievements digitally (Fatkhiyah et al., 2025).

However, there are still gaps in the optimal utilization of technology. Not all students possess adequate digital literacy skills to maximize the use of such technology. In addition, challenges such as unstable internet connections, limited devices, and a lack of technological support from institutions can hinder the effectiveness of its application in academic activities (Maksum & Fitria, 2021). This situation raises the question of how much technology use truly contributes to the improvement of students' academic performance.

The academic performance of students is a key indicator in measuring the success of the learning process. This performance includes cognitive aspects (understanding of the material), affective aspects (learning motivation), and psychomotor aspects (ability to complete academic tasks and projects). Good performance is marked by achieving a high Cumulative Grade Point Average (GPA), active participation in lectures, and timely completion of assignments. With the systematic application of technology, it is hoped that the efficiency, effectiveness, and quality of students' academic achievements can be improved.

This research aims to empirically test the effect of the application of information technology on student performance in academic activities at higher education institutions in Indonesia. Through a quantitative approach and simple linear regression analysis techniques, this study is expected to provide scientific contributions regarding the relationship between these two variables and serve as a basis for recommendations to strengthen higher education digitalization policies.

RESEARCH METHODS

The method used in this research is a survey research with a correlational research type. Research methods are essentially scientific ways to obtain data for specific purposes and uses. According to (Sugiono, 2010), correlational research is a type of research characterized by the problem of a correlational relationship between two variables, independent (X), which is the application of information technology, and dependent variable (Y), which is the academic performance of students in academic activities. The number of respondents in this study is 47 students, collected using a 5-point Likert scale questionnaire, ranging from "strongly disagree" (score 1) to "strongly agree" (score 5). The total score from 15 items regarding the application of information technology is used as the indicator for variable X, and the performance score (in the form of total responses to performance-related questions) is used as variable Y. Before conducting the main analysis, the instrument was tested for reliability using Cronbach's Alpha, resulting in a score of 0.968, indicating a very high level of reliability. The data was then tested for normality using the Kolmogorov-Smirnov test, which yielded a value of 0.200, indicating that the data is normally distributed (Ghozali, 2018).

After the data was deemed valid and reliable, a simple linear regression analysis was conducted to see the extent of the influence of variable X on Y, as well as a partial t-test to determine the significance of the relationship. Calculations were performed using SPSS version 29.

Table 1. Research Design

Component	Description
Research Approach	Quantitative
Method	Correlational Survey
Population	College students in Indonesia
Sample	47 respondents (with purposive sampling)
Data Collection Technique	Questionnaire (Likert Scale 1-5)
Instrument	15 item indicators of information technology application & performance
Analysis Technique	Validity Test, Reliability Test, Normality Test, Simple Linear Regression, Linearity Test, Partial t Test
Analysis Software	IBM SPSS Statistics 29

The data obtained were analyzed using a simple linear regression model with the general formula:

$Y = a + bX$

Where:

Y = Student Performance

X = Implementation of Information Technology

a = Constant

b = regression Coefficient

The results of the regression test showed an R2 value of 0.679, which means that 67.9% of the changes in student performance can be explained by the implementation of information technology. The t-test showed that the X variable significantly affects Y (significance value < 0.001).

HASIL PENELITIAN DAN PEMBAHASAN

This research aims to determine the effect of the application of information technology on student performance in Indonesian higher education institutions. Data were collected from 47 respondents through a questionnaire that has been tested for reliability with a Cronbach's Alpha value of 0.968, indicating that the research instrument has very high internal consistency.

1. Validity Test

Based on the validity test results for the variable of information technology application (X) conducted during the instrument trial with 47 respondents and 15 statements, it was found that all 15 statements were valid. Based on the validity test results for the variable of student performance in academic activities (Y) conducted during the instrument trial with 47 respondents and 15 statements, it was found that all 15 statements were valid.

2. **Reliability Test**

Table 2. Results of Reliability Testing

Cronbach's Alpha	N of Items
0,958	15

From the table above, a Cronbach's Alpha value of 0.958 was obtained, indicating that the questionnaire for the application of information technology (variable X) and the questionnaire for student performance in academic activities (variable Y) are considered reliable, as the Cronbach's Alpha value of 0.958 > 0.600.

3. **Normality Test**

Before conducting the regression analysis, the data was tested for distribution using the One-Sample Kolmogorov-Smirnov Test. The results of the normality test showed that the residual data had an Asymp. Sig. (2-tailed) value of 0.200, which is greater than 0.05. This indicates that the data is normally distributed and meets the assumptions of linear regression.

Table 3. Kolmogorov-Smirnov Normality Test

Parameter	Value
N	47
Std. Deviation	0,124
Asymp. Sig. (2-tailed)	0,200
Conclusion	Normal Distribution

4. **Simple Linear Regression Analysis**

After the normality assumption was met, a simple linear regression analysis was conducted to determine the extent of the influence of the application of information technology (X) on student performance (Y). The regression results showed an R value of 0.824 and an R2 value of 0.679, which means that 67.9% of the variation in student performance is explained by the variable of the application of information technology, while the remaining 32.1% is influenced by other factors outside this model (Arikunto, 2020).

Table 4. ANOVA (Simple Linear Regression)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	265,617	1	265,617	95,249	< 0,001
Residual	125,490	45	2,789		
Total	391,106	46			

5. **Linearity Test (ANOVA Table)**

Next, a Linearity Test was conducted to test the significance of the model simultaneously. The ANOVA test results showed a Linearity value of 102.344 with a significance of 0.000.

This indicates that the regression model as a whole is significant in predicting the dependent variable, which is student performance.

Table 5. Results of ANOVA Table

Sumber Variasi	Sum of Squares	df	Mean Square	F	Sig.
Regression (Combined)	326,223	21	15,534	5,986	< 0,001
Linearity	265, 617	1	265,617	102,344	< 0,001
Deviation from Linearity	60,606	20	3,030	1,168	0,353
Within Groups	64,883	25	2,595		
Total	391,106	46			

6. T-Test (Partial) And Regression Coefficients

The t-test was conducted to determine the effect of the application of information technology variables partially on student performance. The regression coefficient value of 0.238 with a t-count value of 9.760 and sig. = 0.000 ($p < 0.001$) indicates that there is a positive and significant effect between the variable of information technology application and student performance. The regression equation is: $Y = 0,944 + 0,238X$

This means that each increase of one unit in the application of information technology will increase student performance by 0.238 units.

Table 6. Results of T-Test and Regression Coefficient

Variabel	B	Std. Error	Beta	t	Sig.
Constant	0,944	0,630	-	1,498	0,141
Application of IT	0,238	0,024	0,824	9,760	< 0,001

These results support the theory that the use of technology in learning provides ease, speed, and efficiency that impacts the improvement of student performance in academic aspects. This research is in line with the findings of Hasanah & Prasetya (2023), which show that digital literacy and the utilization of technology have a significant relationship with student learning outcomes.

DISCUSSION

The results of this study indicate that the application of information technology has a significant impact on student performance in academic activities. These findings suggest that the better students utilize technology in the learning process, the higher their performance in completing academic tasks. This is reflected in the results of a simple linear regression analysis

showing an R^2 value of 0.679, meaning that 67.9% of the variation in student performance can be explained by the application of information technology.

The significant improvement in student performance can be understood through various dimensions of technology use, such as accessibility to online learning resources, speed of academic communication, and flexibility of time in completing assignments. Information technology enables students to access journals, e-books, learning videos, and engage in online discussions anytime and anywhere. This supports previous research findings that emphasize that the integration of information technology in learning has a positive impact on learning outcomes and student participation.

In addition, the t-test results in this study indicate that the variable of information technology application has a significant partial effect on the academic performance variable with a significance value of < 0.001. This reinforces the opinion that students' competence in using technology is an important factor in supporting their learning productivity and effectiveness (Nasution, 2021). Students who are accustomed to using digital applications, LMS platforms, and academic software tend to understand the material and complete assignments more quickly and accurately.

However, it cannot be overlooked that other external factors also influence student performance, such as learning motivation, the quality of lecturers, the learning environment, and support from educational institutions. The Adjusted R^2 value of 0.672 indicates that there are still 32.8% of other variables not studied in this model that could affect students' academic performance. Therefore, these results also serve as a catalyst for further research involving other affective and sociological variables.

These findings are also in line with the constructivist approach in modern learning, where students are no longer just recipients of information, but active subjects in building knowledge through interaction with various learning media, including technology. Information technology is not only a supportive tool but also part of the process of shaping students' learning experiences independently (Sanjaya, 2021).

In the context of higher education in Indonesia, these results provide a strong foundation for institutions to continue developing learning technology infrastructure. Investment in userfriendly LMS platforms, digital literacy training for students and lecturers, as well as adequate technical support, needs to be a serious concern so that the benefits of information technology can be felt evenly across all student groups.

CONCLUSION

Based on the results of a study conducted on 47 students from various universities in Indonesia, it can be concluded that the application of information technology has a significant and positive impact on students' academic performance. The results of simple linear regression analysis show that 67.9% of the variation in student performance can be explained by the variable of information technology application. The t-test shows a significance value of < 0.001, which means the relationship between the two variables is very strong and not due to chance. This proves that the higher the intensity and quality of technology use in academic activities, the better the students' performance in completing assignments, attending lectures, and achieving learning outcomes. This finding reinforces the importance of developing digital infrastructure in higher education institutions as well as enhancing information technology literacy among students. Higher education institutions need to provide support in the form of training, access to digital learning platforms, and technical assistance so that students can optimally utilize technology. In

addition, this research opens up opportunities for further studies involving other variables such as learning motivation, learning styles, and social environments that also contribute to academic performance. With a more comprehensive approach, it is hoped that the influence of technology on learning in the digital age can be understood and maximally utilized.

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