International Journal of Multidisciplinary Research of Higher Education (IJMURHICA)
http://ijmurhica.ppj.unp.ac.id/index.php/ijmurhica

Impact Analysis of Using Artificial Intelligence on Student Skill Development

Muhammad Hafidz Khusnadin[1], Munawir Hasan[2], Fani Agung Mulyani[3], Puja Dikusuma Mardiana[3], Tsania Siti Khopipah[3]

[1]Institut Agama Islam Negeri Metro Lampung, Indonesia
[2]Institut Agama Islam Negeri Pontianak, Indonesia
[3]Universitas Islam Negeri Sunan Gunung Djati Bandung, Indonesia
Munawiral76@gmail.com *

Article Information:
Received May 23, 2025
Revised June 19, 2025
Accepted July 28, 2025

Keywords: *Artificial Intelligence, efficiency, accuracy, independence, academic skills*

Abstract

Advances in artificial intelligence have brought significant changes in various aspects of life, including higher education. This study aims to analyze the impact of using Artificial Intelligence on students' academic skills, focusing on aspects of efficiency, accuracy, and independence in completing academic tasks. Using a quantitative approach with a survey method, this study involved 100 students as respondents. The data collected was analyzed using descriptive statistical tests, Pearson correlation, and multiple linear regression to identify the relationship between the variables studied. The results showed that although Artificial Intelligence can improve efficiency and provide wider access to academic information, its effect on students' academic skills was not statistically significant. Regression analysis revealed that students' efficiency, accuracy, and independence in using AI explained only 3% of the variation in their academic skills, while the other 97% was influenced by other factors. This finding confirms that over-reliance on AI may hinder the development of students' critical and analytical thinking skills, as described in constructivist learning theory and cognitive learning theory. The implications of this research suggest that educational institutions need to develop policies that encourage the judicious use of Artificial Intelligence, ensuring that Artificial Intelligence acts as a learning tool without replacing students' independent thinking processes.

INTRODUCTION

The development of artificial intelligence can be traced back to the mid-20th century. The concept of Artificial Intelligence first appeared in 1956 at the Dartmouth conference initiated by John McCarthy, a computer scientist who later became known as one of the fathers of Artificial Intelligence (Sitorus & Murti, 2024). In the conference, McCarthy along with other scientists such as Marvin Minsky, Nathaniel Rochester, and Claude Shannon discussed the idea that machines could be programmed to mimic human intelligence. Since then, the research and development of Artificial Intelligence has continued to grow

How to cite: Khusnadin, M. H., Hasan, M., Mulyani, F. A., Mardiana, P. D., Khopipah, T. S. (2025). Impact Analysis of Using Artificial Intelligence on Student Skill Development. *International Journal of Multidisciplinary of Higher Education (IJMURHICA)*, *8*(3), 605-621.

E-ISSN: 2622-741x
Published by: Islamic Studies and Development Center Universitas Negeri Padang

rapidly, resulting in various approaches and increasingly sophisticated technologies in the field of computing (Saudagar & Sadikin, 2023).

Over time, Artificial Intelligence underwent various phases of development, from rule-based systems to machine learning and deep learning (Muarif et al., 2022). One of the important milestones in the history of Artificial Intelligence was the development of artificial neural networks in the 1980s and the advancement of machine learning algorithms in the early 21st century (Fathony et al., 2024; Firdaus et al., 2023). Today, Artificial Intelligence has been applied in various sectors, including healthcare, industry, and education, with applications such as chatbots, data analysis, and recommendation systems that aid in decision-making (Farman et al., 2024).

Indonesia as one of the countries with the largest population of internet users has also experienced a surge in the use of Artificial Intelligence in various fields, including education (Rizki et al., 2024). Students in Indonesia are increasingly utilizing various Artificial Intelligence applications to support their academic activities (Nalbant & Aydin, 2025). This requires further studies on how Artificial Intelligence affects students' skills in completing final assignments, both in terms of efficiency, accuracy, and independence (Nasution et al., 2025).

In recent years, the use of Artificial Intelligence in Indonesia has increased significantly. Based on Writer Buddy's report, during the period September 2022 to August 2023, Indonesian internet users generated 1.4 billion visits to AI apps, or about 5.60% of the total global traffic (Dwihadiah et al., 2024). This places Indonesia as the country with the third highest rate of visits to AI apps in the world, after the United States and India. The United States recorded 5.5 billion visits (22.62%), while India recorded 2.1 billion visits (8.52%) (Syahira et al., 2023).

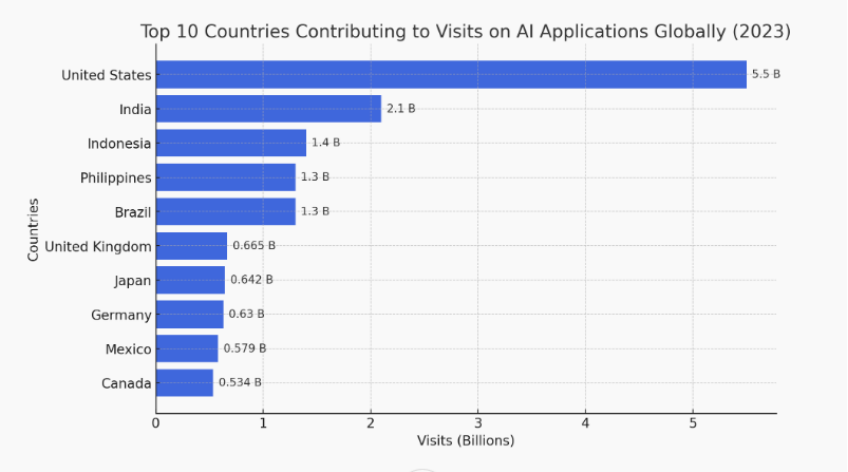

Fig 1. Data on the most users of Artificial Intelligence

The most used Artificial Intelligence application in the past year was ChatGPT with a total of 14.6 billion visits globally, followed by Character. Artificial Intelligence with 3.8 billion visits and QuillBot with 1.1 billion visits (Muhamad, 2024). This data shows that students and the general public are increasingly relying on Artificial Intelligence in various activities, including in the learning and working process (Annas et al., 2024). However, there are major challenges in the use of Artificial Intelligence in academia. One of the main concerns is the potential for over-reliance on AI, which can reduce students' ability to think critically and independently (Panda et al., 2024). If students are overly reliant on Artificial Intelligence for their final projects, their skills in deep analysis and original thinking may suffer. On the other hand, Artificial Intelligence also opens up new opportunities for students to improve the quality of their academic work. With the help of Artificial Intelligence, students can

obtain broader references, perform more complex data analysis, and improve their skills in composing academic arguments. Therefore, this research will examine how students can optimally utilize Artificial Intelligence without losing the essence of the learning process itself (Pertiwi et al., 2023).

The development of artificial intelligence technology has brought significant changes in various aspects of human life, including in the field of higher education (Akhyar et al., 2023). Artificial Intelligence is now an integral part of various academic processes, ranging from searching for references, preparing reports, to completing final assignments (Syamsidar & Samsinar, 2024). Its ability to process data quickly, provide in-depth analysis, and assist decision-making makes it an increasingly desirable tool for students in completing their academic tasks (Hidayanti & Azmiyanti, 2023).

The phenomenon of using Artificial Intelligence in academia has led to various discussions regarding its impact on student skills (Saudagar & Sadikin, 2023; Supriyadi & Indonesia, 2024). On the one hand, Artificial Intelligence is considered to be able to increase efficiency in learning and working, help students understand the material better, and reduce the workload in the research process. However, on the other hand, there are concerns that reliance on Artificial Intelligence can reduce students' critical thinking skills, creativity, and independence in completing academic tasks. The Artificial Intelligence Index Report 2024 survey by Stanford University shows that Indonesians are among the most optimistic in the world towards Artificial Intelligence technology (Berliana et al., 2024). This optimism indicates that Indonesians see great potential for Artificial Intelligence in improving various aspects of life. The high adoption and optimism towards Artificial Intelligence, coupled with the abundance of software developer talent, creates great opportunities for Indonesia (Satrial et al., 2024).

Widespread digital connectivity and high intensity of internet usage further strengthen this potential. The year 2023 marks the accelerated use of Artificial Intelligence in education (Sodikin, 2024). Open Artificial Intelligence released ChatGPT, an Artificial Intelligence-based language model capable of generating near-real-time answers to a variety of academic needs, including writing essays, summarizing books, and solving math problems. Students now have access to advanced technology that can support their learning process more efficiently (Faisal, 2024).

BestColleges conducted a survey of 1,000 undergraduate and graduate students to find out their perspective on Artificial Intelligence in higher education. The results show that 56% of students have used AI in assignments or exams, while 41% have never used this technology, and 4% chose not to answer. In addition, more than half of the students (53%) stated that they had attended courses that required the use of AI as part of their academic assignments. On the other hand, the ethical use of AI in academia is still debatable. About 51% of students believe that the use of AI in exams is a form of cheating. This shows the need for a clear policy in regulating the use of AI in academia.

In a webinar held in October 2023 titled "Applying Artificial Intelligence to Improve Courses, Teaching, and Learning", Andrew Maynard, a professor at Arizona State University, stated that the education system must adapt to create better assessment methods. He emphasized that mastering AI skills is essential for students to be prepared for the ever-changing world of work. Several previous studies have highlighted the impact of AI on academia.

According to research conducted by Amalia et al., (2024) the use of Artificial Intelligence in education can increase student learning efficiency by up

to 40%. Artificial Intelligence allows students to access information faster, understand complex concepts through interactive models, and improve their analytical skills through more sophisticated data processing. However, another study conducted by Smith & Lee in 2022 showed that students who rely too much on AI tend to experience a decline in critical thinking skills and creativity. Artificial Intelligence that provides instant answers can reduce students' desire to explore various perspectives and do independent problem solving. Constructivism theory in education, developed by Piaget and Vygotsky, emphasizes the importance of active interaction in the learning process. In the context of Artificial Intelligence, this theory highlights that student need to remain actively involved in the learning process and not just passively receive information from Artificial Intelligence. Thus, the use of Artificial Intelligence should be directed to support students' intellectual exploration, not replace it (Supangat et al., 2021).

In addition, the concept of Artificial Intelligence in learning can also be linked to Cognitive Theory, which emphasizes the importance of information processing in the learning process. Artificial Intelligence can help students manage information more effectively, but if not used wisely, Artificial Intelligence can also cause information overload which hinders academic understanding (Marlin et al., 2023). The increasing trend of Artificial Intelligence use in Indonesia, especially among university students, suggests the need for an in-depth analysis of how Artificial Intelligence affects students' academic skills. Does Artificial Intelligence really increase the effectiveness of learning, or does it decrease the level of independence of students? This question is one of the main focuses of this research. Students in Indonesia are increasingly using Artificial Intelligence to complete various academic tasks. Applications such as ChatGPT, Grammarly, QuillBot, and other Artificial Intelligence are used to speed up the writing process, summarize literature, and perform data analysis. Artificial Intelligence has become a very effective tool in increasing student productivity (Peliza, 2024).

This research focuses on students with a total of 100 respondents. The selection of the research location was based on the university's achievement in being ranked first in the category of the best State Islamic Religious Universities in Indonesia based on the Webometrics Ranking of Universities Edition 2025 with a rank of 2528 World Rank. Therefore, this study aims to understand the impact of the use of Artificial Intelligence on student skills at this institution that has a high academic reputation. Based on the explanation above, this research aims to examine the impact of using Artificial Intelligence on student skills in completing final assignments, with a focus on aspects of efficiency, accuracy, and independence. This research will also provide recommendations for students, lecturers, and educational institutions in utilizing Artificial Intelligence optimally without sacrificing academic quality and the development of students' critical skills.

METHODS

This study uses a quantitative approach with a survey method to measure the impact of using Artificial Intelligence on student skills (Awaluddin et al., 2025; Dengen & Budiawan, 2025; Jannah, 2018; Rahmiati et al., 2023). The quantitative approach was chosen because it is able to provide an empirical description of the relationship between the variables under study, namely efficiency, accuracy, and student independence in completing academic tasks (Nasehudin & Gozali, 2012). With this approach, the research can identify patterns of using Artificial Intelligence and analyze its effect on students'

academic skills. The research design used is descriptive and correlational. The descriptive design aims to describe the extent to which students use Artificial Intelligence in their academic tasks, while the correlational design is used to examine the relationship between the use of Artificial Intelligence and students' academic skills (Gao et al., 2025).

The population in this study were students who were active in the 2024/2025 academic year. The research sample amounted to 100 students selected by purposive sampling technique, namely students who have used Artificial Intelligence in completing their academic assignments. The selection of one of Indonesia's universities as a research location is based on the university's achievement in being ranked first in the category of the best State Islamic Religious Universities in Indonesia based on the Webometrics Ranking of Universities Edition 2025. This ranking indicates that the university has academic quality and a learning environment that supports the integration of technology in education, making it a relevant location for this research.

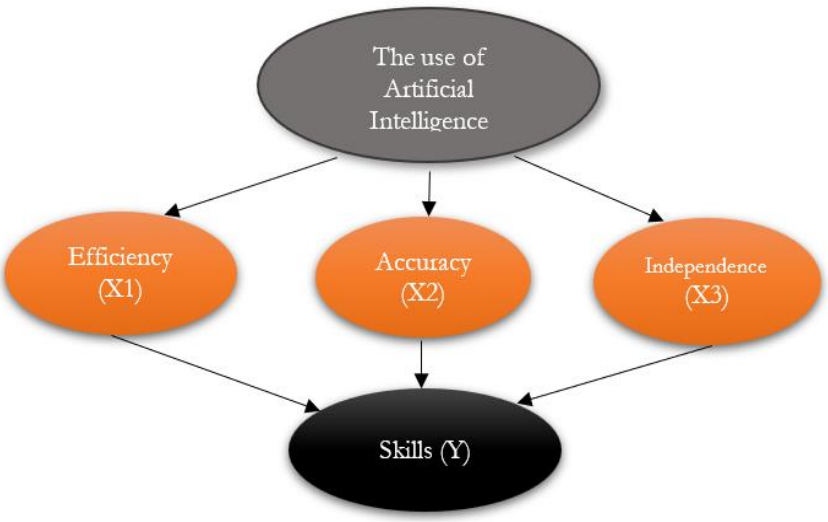

Fig 2. Research Variables

The research instrument used is a questionnaire that is structured based on three main aspects in the use of Artificial Intelligence, namely efficiency (X1), accuracy (X2), and independence (X3), as well as its impact on student independence (Y). Efficiency (X1) refers to how Artificial Intelligence helps students in completing academic tasks more quickly and optimally. Accuracy (X2) measures the extent to which students can obtain correct and relevant information through Artificial Intelligence. Meanwhile, independence (X3) assesses how far students are still able to think critically and complete tasks independently without full dependence on Artificial Intelligence. The dependent variable in this study is student independence (Y), which reflects the extent to which students can still complete academic tasks independently despite using Artificial Intelligence as a tool (Yam & Taufik, 2021).

This questionnaire consists of questions that measure the extent to which students find Artificial Intelligence useful in completing their academic tasks. Each item is measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) to obtain quantitative data that can be analyzed statistically. Prior to data analysis, the research instruments were tested for validity and reliability. The validity test was conducted using Exploratory Factor Analysis (EFA) to ensure that each item in the questionnaire actually measured the desired concept. Meanwhile, the reliability test uses Cronbach's Alpha, where the reliability value above 0.70 is considered to meet the reliability standards of the research instrument (Nasehudin & Gozali, 2012).

The data obtained were analyzed using descriptive statistics to describe

the pattern of use of Artificial Intelligence by students. This analysis includes frequency distribution, percentage, as well as the mean value and standard deviation of each research variable (Mustofa, 2013). After that, Pearson correlation analysis was conducted to determine the extent of the relationship between the use of Artificial Intelligence and students' academic skills. Furthermore, multiple linear regression analysis was used to test the effect of independent variables (efficiency, accuracy, and independence) on the dependent variable, namely student independence. Hypothesis testing was conducted using the t-test and F-test at the 5% significance level ($p < 0.05$) to determine whether the effect observed in this study was significant or not (Qu & Jing, 2025).

RESULT AND DISCUSSION

Descriptive Statistical Test Results

Descriptive statistics are used to provide an initial description of the characteristics of the data in this study entitled Analysis of the Impact of Using Artificial Intelligence on Student Skill Development: A Study of Efficiency, Accuracy, and Independence. The use of artificial intelligence in the context of education has become an interesting research subject, especially in examining how this technology affects aspects of efficiency, accuracy, and student independence in the learning process (Akhyar et al., 2023). Descriptive statistical analysis aims to display a numerical summary of the data collected, including the number of respondents (N), minimum value, maximum value, mean, and standard deviation of each variable studied.

The results of descriptive statistical analysis show that the efficiency variable has a sample size of 100 respondents with a minimum value of 10 and a maximum value of 37. The average efficiency score obtained by students was recorded at 23.45 with a standard deviation of 7.364. This range of values indicates that there is significant variation in the level of efficiency of students in utilizing artificial intelligence to improve their academic productivity. The relatively high standard deviation indicates that the spread of the data is quite large, which means that students have different levels of efficiency when using artificial intelligence.

The accuracy variable in this study shows that the minimum value obtained by students is 8, while the maximum value reaches 34. The average accuracy score is recorded at 20.45 with a standard deviation of 6.509. This value indicates that the accuracy of students in completing tasks with the help of artificial intelligence varies significantly. The average score of 20.45 reflects that the majority of students have a fairly good level of accuracy, although there are notable differences between them as seen from the minimum and maximum values which are quite far apart. The independence variable was analyzed to assess the extent to which students are able to work independently in completing academic tasks with the help of artificial intelligence. The data showed that the minimum value of this variable was 10, while the maximum value reached 37. The average score of independence was recorded at 23.77 with a standard deviation of 6.740. This data shows that students have varying levels of independence when using artificial intelligence. The relatively high mean score indicates that most students are able to use this technology with a fairly good level of independence, although there are still some individuals who depend on external systems or support in optimizing its use. The last variable analyzed was skill.

In this study, students' skills that developed as a result of using artificial intelligence were measured with a minimum score of 14 and a maximum score

of 44. The average skill score was 29.99 with a standard deviation of 8.423. The higher mean score compared to other variables indicates that the use of artificial intelligence tends to have a greater impact on students' overall skill development. The larger standard deviation on this variable indicates a wide variation in the skills acquired by students, which may be influenced by factors such as the individual's experience in using artificial intelligence as well as their initial skill level before they started using it.

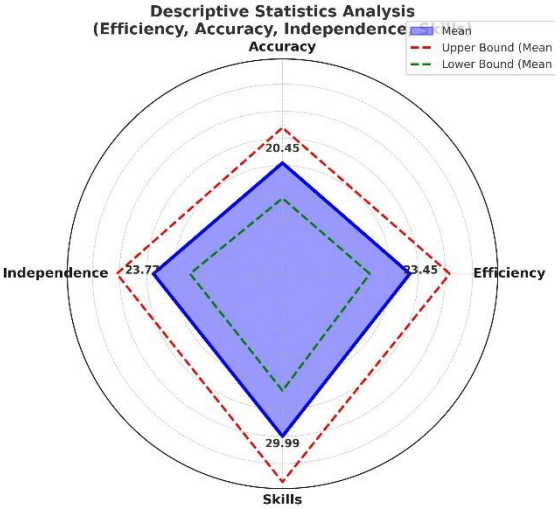

Fig 3. Descriptive Statistical Test Results

The results of the descriptive statistics in this study indicate that there is considerable variation in all the variables analyzed. The data shows that students have different levels of efficiency, accuracy, independence, and skill in utilizing artificial intelligence to support their academic activities. The wide range of minimum and maximum values shows that some students are able to optimize this technology very well, while others still have difficulty in adapting to its use.

In addition, these results also reflect the disparity in students' ability to adopt artificial intelligence as a learning tool. The relatively high standard deviation in each variable indicates that the level of data dispersion is quite large, which indicates that there are significant differences in students' experience in using artificial intelligence. These differences can be caused by a variety of factors, including students' level of digital literacy, access to technological resources, and learning strategies implemented in the academic curriculum. Interpretation of the descriptive statistical results is an important basis for further analysis of the relationship between the variables studied. For example, correlation analysis can be conducted to determine whether there is a significant relationship between efficiency, accuracy, independence, and students' skills in using artificial intelligence. In addition, regression analysis can be used to identify which variables have the most influence on student skill development.

The results of this study confirm that the use of artificial intelligence has great potential in improving students' skills, despite significant variations in their experience of its use. Therefore, the integration of artificial intelligence in higher education should be done strategically and evidence-based in order to provide optimal benefits for students at different levels of skills and digital readiness.

Pearson Correlation Test

The use of artificial intelligence in the context of education has become an interesting research subject, especially in examining how this technology

affects aspects of efficiency, accuracy and student independence in the learning process. Descriptive statistical analysis aims to display a numerical summary of the data collected, including the number of respondents (N), minimum value, maximum value, mean, and standard deviation of each variable studied.

Table 1. Pearson Correlation Test

Variable	Efficiency	Accuracy	Independence	Skills
Efficiency	1	-0.059	-0.078	-0.001
Accuracy	-0.059	1	-0.018	0.074
Independence	-0.078	-0.018	1	0.155
Skills	-0.001	0.074	0.155	1

This study also conducted a Pearson correlation test to identify the relationship between the variables of efficiency, accuracy, independence, and student skills. The Pearson correlation test results showed that the correlation between efficiency and accuracy was negative at -0.059 with a significance value of 0.559, indicating that the relationship between these two variables was not statistically significant. Similarly, the correlation between efficiency and independence showed a value of -0.078 with a significance of 0.438, which also showed no significant relationship.

The correlation between efficiency and skills is almost non-existent, with a value of -0.001 and a significance of 0.989, indicating that students' efficiency in using artificial intelligence is not directly related to the level of skills they acquire. Meanwhile, the relationship between accuracy and independence has a correlation value of -0.018 with a significance of 0.856, which means there is no significant relationship between the two variables. Accuracy also had a very small positive correlation to skill, with a value of 0.074 and a significance of 0.462, indicating that this relationship was not strong enough to be considered significant.

The independence variable showed a positive correlation with skills with a value of 0.155 and a significance of 0.123. Although the correlation value is higher than other variables, this relationship is still within the limits of statistical insignificance, so it cannot be concluded that the level of independence of students in using artificial intelligence has a direct influence on their skills. The overall Pearson correlation test results show that there is no significant relationship between efficiency, accuracy, and independence with students' skills in using artificial intelligence. This finding indicates that other factors may have a greater influence on students' skill development. Therefore, further research with a more in-depth approach is needed to identify factors that significantly influence students' skill development in the context of artificial intelligence.

Coefficient of determination

Higher education plays an important role in shaping students' skills to be ready for the professional world. Various factors influence this process, including efficiency, accuracy and independence in learning. This study aims to analyze the extent to which these three variables contribute to students' skill development. Using statistical analysis, particularly the coefficient of determination, this study evaluates the extent to which the model used is able to explain variations in students' skills and identifies possible other factors that are more influential.

Table 2. Coefficient of determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.174	0.030	0.000	8.422

The coefficient of determination (R Square) is an indicator that shows how much the independent variables in the model can explain the variation in

the dependent variable. In this study, the R Square value of 0.030 indicates that the independence, accuracy, and efficiency variables are only able to explain 3% of the variation in student skill development. Meanwhile, the remaining 97% is explained by other variables outside the model used. The Adjusted R Square value of 0.000 indicates that after adjusting for the number of independent variables in the model, the predictive contribution of these variables to student skill development is not significant. This indicates that the variables in this study are not strong enough to explain the relationship with the dependent variable.

In addition, the standard error of the estimate of 8.422 indicates the level of uncertainty or deviation of the prediction from the model to the actual value. The smaller the standard error value, the better the model is at estimating. Based on the above explanations, this finding shows that the factors of efficiency, accuracy, and independence in learning have very little influence on student skill development.

F test

Regression analysis is one of the statistical techniques commonly used in research to measure the relationship between independent variables and dependent variables. One of the important tests in regression analysis is the F test, which serves to test whether the independent variables simultaneously have a significant effect on the dependent variable. In this study, the F test was used to assess the contribution of independence, accuracy, and efficiency to student skill development.

Table 3. F test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	212,903	3	70,968	1,000	,396[b]
	Residual	6810,087	96	70,938		
	Total	7022,990	99			

Based on the results of the analysis of variance (ANOVA), the F value is 1.000 with a significance level (Sig.) of 0.396. A significance value greater than 0.05 indicates that the regression model used is not statistically significant. In other words, there is not enough evidence to state that the variables of independence, accuracy, and efficiency simultaneously have a meaningful influence on student skills. This indicates that the three independent variables tested were not able to substantially explain the variation in student skills in the model used.

Furthermore, the sum of squares value for the regression of 212,903 compared to the residual of 6810,087 indicates that most of the variation in student skills is not explained by the variables used in this study. This means that there are other factors outside the model that are more dominant in influencing student skills. With a total sum of squares of 7022,990, it can be concluded that the model developed has low predictive power of student skills.

In addition, the mean square values for regression and residual are almost the same, at 70.968 and 70.938, further reinforcing the finding that this model does not have sufficient ability to explain the variability of student skills. Ideally, in a good regression model, the mean square value of the regression should be greater than that of the residual, thus indicating that the independent variables tested make a real contribution to the dependent variable. The implication of these results is that while independence, accuracy and efficiency are considered factors that could potentially influence students' skills, in the context of this study, their influence was not significant enough. Therefore,

further studies are needed to identify other factors that have a stronger correlation with students' skills, such as teaching quality, practical experience, or broader academic environment factors. The results of the F test in this study show that the regression model used has not been able to significantly explain the influence of independence, accuracy, and efficiency on student skills. Although these three variables have a role to play in the learning context, this study indicates that there are other variables that are more decisive in developing student skills.

Test t (Hypothesis)

The t test was conducted to test the significance of the effect of each independent variable (Efficiency, Accuracy, and Independence) on the dependent variable, namely Skills. Based on the results of regression analysis, unstandardized and standardized coefficients, as well as the t value and significance (Sig.) of each independent variable, the following information is obtained.

Table 4. Test t (Hypothesis)

Variables	B (Unstandardized Coefficients)	Std. Error	Beta (Standardized Coefficients)	t	Sig. (p-value)
Constant	22,812	5,163	-	4,418	0,000
Efficiency	0,018	0,116	0,016	0,155	0,877
Accuracy	0,101	0,130	0,078	0,776	0,440
Independence	0,197	0,126	0,158	1,566	0,121

For the Constant variable, the coefficient value of 22.812 indicates that when all independent variables (efficiency, accuracy, and independence) are zero, the predicted Skill value is 22.812. The results of the t test on the constant produced a t value of 4.418 with a very low level of significance, namely 0.000. This shows that the constant has a significant influence on student skills, and the value of skills in this condition cannot be ignored in the regression model. Furthermore, for the Efficiency variable, the regression coefficient obtained is 0.018, which indicates that every one unit increase in Efficiency will increase Skills by 0.018. However, the t-test result for Efficiency shows a t-value of 0.155 with a significance level of 0.877. Since the significance value is greater than 0.05, it can be concluded that the effect of Efficiency on Skills is not statistically significant at the $\alpha = 0.05$ significance level. Thus, although Efficiency contributes positively to Skills, its influence is not strong enough to be considered significant. Similarly, for the Accuracy variable, the regression coefficient of 0.101 indicates that every one unit increase in Accuracy can increase Skills by 0.101. However, the t-test result for Accuracy shows a t-value of 0.776 with a significance level of 0.440, which is greater than 0.05. Therefore, the effect of Accuracy on Skills is also insignificant. Although there is a positive relationship, this variable does not have a significant contribution to the improvement of student skills in the context of this study.

Finally, for the Independence variable, the regression coefficient of 0.197 indicates that every one unit increase in Independence can increase Skills by 0.197. Although the effect of Independence is greater than that of Efficiency and Accuracy, the t-test results show a t-value of 1.566 with a significance level of 0.121, which is also greater than 0.05. This indicates that although there is a considerable positive relationship between Independence and Skills, the effect is not significant at the $\alpha = 0.05$ significance level.

Based on the t-test results, it can be concluded that none of the independent variables (efficiency, accuracy, and independence) have a significant influence on the dependent variable (skills). Although all three variables show a positive relationship with Skills, the significance value greater

than 0.05 for each variable indicates that the effect is not strong enough to be considered significant. Therefore, the results of this study indicate that other factors not included in this regression model may have more influence on the development of students' skills.

Multiple Regression Test

This study aims to explore the influence of efficiency, accuracy, and independence variables on student skill development. Based on the results of multiple regression analysis, the regression equation describing the relationship between these variables and student skills was obtained as follows.

Skill=22.812 + 0.018 (efficiency) +0.101 (accuracy) +0.197 (independence)

This result shows that the three independent variables, namely efficiency, accuracy, and independence, contribute to the prediction of student skills, although the influence of each variable is not statistically significant. Based on the regression coefficient results, it can be interpreted that the constant of 22.812 indicates the value of student skills when all independent variables (efficiency, accuracy, and independence) are zero. This reflects the basic skills that students have without the influence of the three variables. Furthermore, the regression coefficient for efficiency is 0.018, which means that every one unit increase in efficiency will increase students' skills by 0.018. However, the significance value of 0.877 indicates that the effect of efficiency on skills is not significant at the $\alpha = 0.05$ level, so it cannot be considered as a strong influencing factor. For the accuracy variable, the regression coefficient of 0.101 indicates that every one unit increase in accuracy will increase students' skills by 0.101. However, with a significance value of 0.440, which is greater than 0.05, the effect of accuracy on skills is also not significant.

Similarly, the independence variable, which has a regression coefficient of 0.197, indicates that every one unit increase in independence will increase student skills by 0.197. Although the effect of independence is greater than efficiency and accuracy, the significance value of 0.121 indicates that the effect is also not significant at the $\alpha = 0.05$ level.

The quality of the regression model was evaluated using the coefficient of determination (R^2) and the ANOVA test. The coefficient of determination (R^2) of 0.030 indicates that only 3% of the variation in students' skills can be explained by the efficiency, accuracy and independence variables. This suggests that most of the variation in students' skills is influenced by other factors not included in this model. Therefore, this regression model has limited explanatory power for student skills. The ANOVA test gave an F value of 1.000 with a significance level of 0.396, which is greater than 0.05. This indicates that overall, the regression model is not significant in explaining student skills. In other words, the variables of efficiency, accuracy, and independence, both individually and together, do not have a significant influence on student skills. Based on the multiple regression test results, it can be concluded that the model used in this study has limitations in explaining student skill development. Although the three independent variables (efficiency, accuracy and independence) contribute to the regression model, the significance value greater than 0.05 indicates that their influence on student skills is not significant.

Based on descriptive statistical analysis, the average efficiency of students in using Artificial Intelligence was recorded at 23.45, with a standard deviation of 7.364. This indicates that Artificial Intelligence significantly assists students in completing academic tasks more efficiently, despite variations in individual experience. Meanwhile, the accuracy of information generated by Artificial Intelligence has an average score of 20.45, with a standard deviation

of 6.509. This suggests that AI provides relevant and useful academic information, but its effectiveness depends on how students interpret and use it in their studies. In terms of independence, students showed a mean score of 23.77, with a standard deviation of 6.740. This finding suggests that although AI serves as an assistive tool, students still maintain a level of independence in their learning process. However, variations in the data indicate that some students may become overly reliant on AI, while others maintain a more independent approach. In addition, students' overall academic competence after using Artificial Intelligence showed a mean score of 29.99, with a standard deviation of 8.423, indicating the positive contribution of Artificial Intelligence to students' skill development.

Although these findings demonstrate the benefits of Artificial Intelligence, regression analysis revealed that its impact on academic competence was not statistically significant. The coefficient of determination ($R^2 = 0.030$) indicates that only 3% of the variability in students' academic skills can be explained by efficiency, accuracy, and independence, while the remaining 97% is influenced by other factors not accounted for in this study. The ANOVA test also showed an insignificant regression model, with a p value of 0.396 ($p > 0.05$), indicating that Artificial Intelligence, while useful, is not a major factor in shaping students' competencies. Further analysis of the regression coefficients showed that efficiency ($B = 0.018$, Sig. = 0.877) and accuracy ($B = 0.101$, Sig. = 0.440) had very little influence on academic competence. Similarly, independence showed an insignificant influence. These findings indicate that while Artificial Intelligence provides tangible benefits in the academic environment, its impact on improving students' skills is limited.

This research is in line with previous studies that show that although Artificial Intelligence can improve efficiency in learning, this technology does not automatically help students develop critical thinking skills and creativity. Smith & Lee in 2022 found that students who rely too much on AI tend to have lower problem-solving skills. This is because the answers produced by Artificial Intelligence often limit the exploration of various points of view, so students are not accustomed to thinking independently. In education, constructivist learning theory developed by Piaget and Vygotsky emphasizes that effective learning occurs when students are actively involved in building knowledge. If they only passively receive information from Artificial Intelligence, they lose the opportunity to develop a deeper understanding. Similarly, in Cognitive Learning Theory, Artificial Intelligence does help students access and manage information faster, but if used excessively, it can cause information overload that hinders their understanding.

The results of this study show that universities need to implement a balanced strategy in the use of Artificial Intelligence. Artificial Intelligence can indeed be a useful tool, but students must still be trained to think independently and perform critical analysis. Therefore, lecturers need to design tasks that not only ask students to find instant answers from AI, but also encourage them to think creatively, solve problems, and develop analytical skills. In addition, this research also opens up opportunities to examine other factors that affect students' academic competence. Motivation, self-efficacy, and learning strategies may have a greater influence than just the use of AI. To better understand how AI really affects students' learning experience, qualitative research that explores their perceptions and experiences of using AI should also be conducted.

The development of Artificial Intelligence technology has made significant contributions to various aspects of life, including in the field of

higher education (Lin & Yu, 2024). In the academic context, Artificial Intelligence is used to improve learning efficiency, increase accuracy in the preparation of academic assignments, and assist students in data-based decision making. However, the debate on the extent to which AI contributes to students' skill development is still ongoing. Therefore, this study aims to analyze the impact of using Artificial Intelligence on student skills by focusing on aspects of efficiency, accuracy, and independence (Ahmad et al., 2024).

The results of statistical analysis show that Artificial Intelligence is able to improve students' efficiency in completing academic tasks. The average efficiency score of 23.45 with a standard deviation of 7.364 shows that students can access information faster and complete tasks more systematically. However, the Pearson correlation test results showed that efficiency in using Artificial Intelligence did not have a significant relationship with improving students' academic skills ($r = -0.001$, $p = 0.989$). This indicates that although AI accelerates task completion, students still need additional skills to improve the quality of their learning.

Accuracy in the use of Artificial Intelligence has an average score of 20.45 with a standard deviation of 6.509. This result indicates that students benefit from Artificial Intelligence in obtaining more accurate and relevant information. However, the correlation between accuracy and students' skills was not significant ($r = 0.074$, $p = 0.462$), which suggests that although AI provides accurate information, its utilization does not necessarily improve students' analytical skills. This finding is in line with Smith & Lee's in 2022 research, which states that over-reliance on Artificial Intelligence can reduce students' critical thinking in evaluating the truth of information.

The average student independence score of 23.77 with a standard deviation of 6.740 indicates that although Artificial Intelligence is used as a tool, students still maintain autonomy in the learning process. However, the regression results showed that independence did not significantly contribute to students' skill development ($B = 0.197$, $p = 0.121$). This indicates that although students retain control over its use, AI cannot fully replace direct interaction and exploration in the learning process.

The findings of this study can be examined through the perspective of Constructivist Learning Theory developed by Piaget and Vygotsky (Masgumelar & Mustafa, 2021). This theory emphasizes that effective learning occurs when students actively build their own understanding, rather than just passively receiving information. If students rely too much on Artificial Intelligence in completing academic tasks, then they are likely to lose the opportunity to think critically and develop deep understanding (Nurhadi, 2020). Within the framework of Cognitive Learning Theory, Artificial Intelligence can help students manage and access information more quickly (Sutarto, 2017). However, if used without an appropriate learning strategy, students may experience over-reliance on Artificial Intelligence. This has the potential to cause a decrease in analytical skills, as well as inhibit the development of reflective thinking and problem-solving abilities (Yanuardianto, 2019).

In addition, the results of this study confirm that universities and educational institutions need to develop policies that direct students in the wise use of Artificial Intelligence. Students should be taught to use AI as a learning tool, not as a substitute for critical and analytical thinking. Therefore, the academic curriculum needs to integrate approaches that encourage students to continue developing independent thinking while optimally utilizing Artificial Intelligence.

The results of this study show that although Artificial Intelligence helps improve efficiency in completing academic tasks, its influence on students' skills is limited. From the statistical analysis, no significant relationship was found between efficiency, accuracy, and independence with students' academic skills. Therefore, students need to be encouraged to use Artificial Intelligence in a more strategic way so that its benefits can be optimized without neglecting the development of critical and analytical thinking skills.

CONCLUSION

The results of this study show that although Artificial Intelligence helps improve efficiency and ease in completing academic tasks, its influence on students' academic competence is still limited. From the statistical analysis, no significant relationship was found between efficiency, accuracy, and independence with students' academic skills. This finding emphasizes the importance of a balanced use of Artificial Intelligence in education. Students still need to hone their critical and analytical thinking skills so that they do not rely solely on Artificial Intelligence to get instant answers. For this reason, educational institutions need to guide students in using AI effectively, ensuring that this technology becomes a tool, not a substitute for the real learning process. In addition, further research is needed to understand the long-term impact of AI on academic performance as well as other factors that influence students' learning development. With a purposeful and thoughtful approach, higher education can utilize AI without neglecting the principles of deep learning and critical thinking. Therefore, it should be considered as a support to the learning process, not a substitute, so that students can still gain a deep understanding while developing the skills they need to succeed in life.

REFERENCES

Ahmad, Z., AlWadi, B. M., Kumar, H., Ng, B. K., & Nguyen, D. N. (2024). Digital transformation of family-owned small businesses: a nexus of internet entrepreneurial self-efficacy, artificial intelligence usage and strategic agility. In *Kybernetes*. https://doi.org/10.1108/K-10-2023-2205

Akhyar, M., Zakir, S., Gusli, R. A., & Fuad, R. (2023). Pemanfaatan Artificial Intelligence (Ai) Perflexity Ai Dalam Penulisan Tugas Mahasiswa Pascasarjana. *Idarah Tarbawiyah: Journal of Management in Islamic Education*, *4*(2), 219–228. https://doi.org/10.32832/itjmie.v4i2.15435

Amalia, P., Majid, H. A., & Sahrah, I. A. (2024). Peran Teknologi AI dalam Pengembangan Kemampuan Berpikir Kritis Mahasiswa. In *Prosiding Seminar Nasional Fakultas Tarbiyah Dan Ilmu Keguruan IAIM Sinjai* (Vol. 3, pp. 26–31). https://doi.org/10.47435/sentikjar.v3i0.3134

Annas, N. A., Wijayanto, G., Cahyono, D., & Safar, M. (2024). Pelatihan Teknis Penggunaan Aplikasi Artificial Intelligences (AI) Chat Gpt Dan Bard AI Sebagai Alat Bantu Bagi Mahasiswa Dalam Mengerjakan Tugas Perkuliahan. *Journal Of Human And Education (JAHE)*, *4*(1), 332–340. https://doi.org/10.31004/jh.v4i1.617

Awaluddin, A., Annas, F., & Yuspita, Y. E. (2025). The Use of Artificial Intelligence for Marketing Community Economic Products in West Sumatra. *International Journal of Multidisciplinary Research of Higher Education (IJMURHICA*, *8*(2), 220–231. https://doi.org/10.24036/ijmurhica.v8i2.303

Berliana, J. I., Winantoro, C. R., & Damariswara, R. (2024). Analisis Penggunaan Ai Dalam Mengerjakan Tugas Pada Mahasiswa Universitas Nusantara Pgri Kediri Prodi Pgsd Kelas 1C. *Jurnal Review Pendidikan Dan*

Pengajaran, *7*(3), 9724–9731. https://doi.org/10.31004/jrpp.v7i3.30459

Dengen, A., & Budiawan, B. (2025). Integrating Artificial Intelligence in Malaria Mosquitoes: A Bibliometric Analysis for Species Identification and Automated Detection. *International Journal of Multidisciplinary Research of Higher Education (IJMURHICA*, *8*(2), 251–265. https://doi.org/10.24036/ijmurhica.v8i2.336

Dwihadiah, D., Gerungan, A., & Purba, H. (2024). Penggunaan ChatGPT di Kalangan Mahasiswa dan Dosen Perguruan Tinggi Indonesia. *CoverAge: Journal of Strategic Communication*, *14*(2), 130–145. https://doi.org/10.35814/coverage.v14i2.6058

Faisal, M. (2024). *Dampak Kecerdasan Buatan (AI) terhadap Pola Pikir Cerdas Mahasiswa di Pontianak*. https://doi.org/10.37010/nuc.v5i1.1684

Farman, I., Wahid, A., Alamsyah, N., & Taufik, A. (2024). Transformasi Pendidikan di Era AI Studi Kasus Penggunaan Chatgpt dalam Pembelajaran Daring. *Jurnal Review Pendidikan Dan Pengajaran (JRPP*, *7*(4), 16393–16398.

Fathony, M. H., Hizraini, A. A., Aulia, R., & Almaisarah, A. (2024). Persepsi Mahasiswa Terhadap Penggunaan Chatgpt Di Universitas Nahdlatul Ulama Kalimantan Selatan. *Jurnal Review Pendidikan Dan Pengajaran (JRPP*, *7*(4), 16601–16607. https://doi.org/10.31004/jrpp.v7i4.37966

Firdaus, M. R., Irawan, R. R., Mahardika, C. H. Y., Gaol, P. L., & Prinaryanto, B. A. (2023). Tantangan Teknologi Artificial Intelligence pada Kegiatan Pembelajaran Mahasiswa. *IJEDR: Indonesian Journal of Education and Development Research*, *2*(1), 379–384. https://doi.org/10.57235/ijedr.v2i1.1781

Gao, Y., Liu, S., & Yang, L. (2025). Artificial intelligence and innovation capability: A dynamic capabilities perspective. *International Review of Economics and Finance*, *98*. https://doi.org/10.1016/j.iref.2025.103923

Hidayanti, W., & Azmiyanti, R. (2023). Dampak Penggunaan Chat GPT pada Kompetensi Mahasiswa Akuntansi: Literature Review. *Seminar Nasional Akuntansi Dan Call for Paper (SENAPAN)*, *3*(1), 83–91. https://doi.org/10.33005/senapan.v3i1.288

Jannah, M. (2018). Studi Komparasi Akhlak Terhadap Sesama Manusia Antara Siswa Fullday School Dengan Siswa Boarding School di Kelas XI SMA IT Abu Bakar Yogyakarta. *Jurnal Pendidikan Agama Islam Al-Thariqah*, *3*(2), 1–15. https://doi.org/10.25299/althariqah.2018.vol3(2).2216

Lin, Y., & Yu, Z. (2024). A bibliometric analysis of artificial intelligence chatbots in educational contexts. *Interactive Technology and Smart Education*, *21*(2), 189–213. https://doi.org/10.1108/ITSE-12-2022-0165

Marlin, K., Tantrisna, E., Mardikawati, B., Anggraini, R., Susilawati, E., Proses, T., Etika, P., Mahasiswa, K., Perguruan, D., Khairul, T., 1, M., Uin

Yunus Batusangkar, M., Transportasi, P., & Bali, D. (2023). Manfaat dan Tantangan Penggunaan Artificial Intelligences (AI) Chat GPTTerhadap Proses Pendidikan Etika dan KompetensiMahasiswa Di Perguruan Tinggi. *INNOVATIVE: Journal Of Social Science Research*, *3*(6), 5192–5201. https://j-innovative.org/index.php/Innovative/article/view/7119

Masgumelar, N. K., & Mustafa, P. S. (2021). Teori Belajar Konstruktivisme dan Implikasinya dalam Pendidikan. *GHAITSA: Islamic Education Journal*, *2*(1), 49–57. https://doi.org/10.62159/ghaitsa.v2i1.188

Muarif, J. A., Jihad, F. A., Alfadli, M. I., & Setiabudi, D. I. (2022). Hubungan Perkembangan Teknologi Ai Terhadap Pembelajaran Mahasiswa. *Jurnal Pendidikan IPS*, *4*(2), 53–60. https://doi.org/10.572349/seroja.v1i2.548

Muhamad, N. (2024). Indonesia, Penyumbang Kunjungan Aplikasi AI Terbanyak ke-3 di Dunia. In *Data Boks* (p. 1). https://databoks.katadata.co.id/datapublish/2024/01/31/indonesia-penyumbang-kunjungan-aplikasi-ai-terbanyak-ke-3-di-dunia

Mustofa, A. (2013). Uji Hipotesis Statistik (Mam 4137). *Statistik (MAM4137)*, *Mam 4137*, 1–12. https://books.google.co.id/books/about/Uji_Hipotesis_Statistik.html?hl=id&id=SAelDwAAQBAJ&redir_esc=y

Nalbant, K. G., & Aydin, S. (2025). A bibliometric approach to the evolution of artificial intelligence in digital marketing. *International Marketing Review*. https://doi.org/10.1108/IMR-04-2024-0132

Nasehudin, T. S., & Gozali, N. (2012). Penelitian Kuantitatif, Metode Penelitian Kuantitatif. In *Google Books* (Issue April 2016, p. 110). https://repository.telkomuniversity.ac.id/pustaka/17084/metode-

Nasution, J. S., Siregar, A. M., Hasibuan, E. S., Difla, F., & Azizah, T. N. (2025). *Dampak Negatif Penggunaan AI Terhadap Mahasiswa Dalam Proses Pembelajaran* (Vol. 3, Issue 1). JURNAL PENDIDIKAN DAN RISET. https://jurnaltarbiyah.uinsu.ac.id/index.php/ami/article/view/4293

Nurhadi, A. (2020). Implementasi Manajemen Strategi Berbasis Pembiasaan dalam Menumbuhkan Kakakter Religius Siswa. *Al-Afkar*, *3*(1), 65–76. https://doi.org/10.31943/afkar_journal.v3i1

Panda, G., Aggarwal, S., Kaswan, M. S., & Duggal, K. (2024). Artificial intelligence in agile human resource practices: systematic literature review and bibliometric analysis. *International Journal of Lean Six Sigma*. https://doi.org/10.1108/IJLSS-07-2024-0159

Peliza, R. (2024). Penerapan Teknologi Artificial Intelligence (Ai) Terhadap Peningkatan Efektivitas Pembelajaran Mahasiswa. *International Conferences on Islamic Studies (ICIS)* , *2*(1), 82–95. https://ejournal.iainkerinci.ac.id/index.php/pik/article/view/3774

Pertiwi, A., Bara, Y. P., & Pakiding, Y. (2023). Mengoptimalkan Pengalaman Belajar menggunakan AI dalam Dunia Pendidikan pada Mahasiswa Teknologi Pendidikan. … *Kristen Indonesia Toraja*, *3*(3), 8. https://doi.org/10.47178/prosidingukit.v3i3.2285

Qu, G., & Jing, H. (2025). Is new technology always good? Artificial intelligence and corporate tax avoidance: Evidence from China. *International Review of Economics and Finance*, *98*. https://doi.org/10.1016/j.iref.2025.103949

Rahmiati, R., Putri, M., Engkizar, E., & Mokhtar, M. M. (2023). The effectiveness of flipbook-based e-modules in increasing student creativity in nail art subject in higher education. *Jurnal Pendidikan Vokasi*, *13*(2), 167–177. https://doi.org/10.21831/jpv.v13i2.54330

Rizki, O. F., Fernandes, R., & Kartika, R. (2024). Pengetahuan dan Pemanfaatan Chat GPT di Kalangan Mahasiswa (Studi Kasus: Mahasiswa Departemen Sosiologi Universitas Negeri Padang. *Naradidik: Journal of Education and Pedagogy*, *3*(3), 222–228. https://doi.org/10.24036/nara.v3i3.218

Satrial, A., Yumna, Y., Muthi'ah, M., Nafi, A. M. B. M., & Salaeh, I. M. Y. (2024). Advancing Educational Practice: Implementation of the Contextual Teaching and Learning Model in Islamic Education. *International Journal of Islamic Studies Higher Education*, *3*(1), 50–66. https://insight.ppj.unp.ac.id/index.php/insight/article/view/200

Saudagar, F., & Sadikin, A. (2023). Pelatihan Teknologi Artificial Intelligences (AI) bagi mahasiswa magang kependidikan MBKM FKIP Universitas

Jambi. *Jurnal JUPEMA*, *2*(2), 45–51. https://doi.org/10.22437/jupema.v2i2.31466

Sitorus, M., & Murti, M. D. F. (2024). Analisis Pengaruh Penggunaan Artificial Intelligence Pada Pembelajaran di Cyber University. *Jurnal Ilmu Komputer Sistem Informasi & Teknologi Informasi (Innotech)*, *1*(2), 90–101. https://ejournal.cyber-univ.ac.id/index.php/innotech/article/view/51

Sodikin, S. (2024). Transformasi Pendidikan Agama Islam Melalui Artificial Intelligent (AI): Upaya Meningkatkan Kemampuan Berpikir Kritis Mahasiswa. *Academicus: Journal of Teaching and Learning*, *3*(2), 78–89. https://doi.org/10.59373/academicus.v3i2.65

Supangat, Saringat, M. Z. bin, & Koesdijarto, R. (2021). Pemanfaatan Artificial Intelligence (AI) sebagai Respon Learning Style Mahasiswa. *Konferensi Nasional Ilmu Komputer (KONIK)*, *5*, 270–279. https://prosiding.konik.id/index.php/konik/article/view/64

Supriyadi, E., & Indonesia, U. P. (2024). Penggunaan ChatGPT Open AI pada penulisan karya tulis ilmiah dan dampaknya bagi mahasiswa. *Prosiding Nasional 2024 Universitas Abdurachman Saleh SItubondo*, *3*(1), 123–130. http://www.unars.ac.id/ojs/index.php/prosidingSDGs/article/view/4799

Sutarto, S. (2017). Teori Kognitif dan Implikasinya Dalam Pembelajaran. *Islamic Counseling: Jurnal Bimbingan Konseling Islam*, *1*(2), 1. https://doi.org/10.29240/jbk.v1i2.331

Syahira, S., Kartini, K., Sulistyahadi, S., & Prafiadi, S. (2023). Persepsi Mahasiswa Prodi Pendidikan Bahasa Inggris Tentang Penggunaan Ai Dalam Pengajaran Bahasa Inggris. *Jurnal Perspektif Pendidikan*, *17*(2), 263–269. https://doi.org/10.31540/jpp.v17i2.2630

Syamsidar, H. S., & Samsinar, S. (2024). Efektivitas Artificial Intelegence (AI) pada Pembelajaran Sains dan Agama untuk Meningkatkan Kemandirian Belajar Mahasiswa. In *Prosiding Seminar Nasional Fakultas Tarbiyah Dan Ilmu Keguruan IAIM Sinjai* (Vol. 3, pp. 18–25). https://doi.org/10.47435/sentikjar.v3i0.3135

Yam, J. H., & Taufik, R. (2021). Hipotesis Penelitian Kuantitatif. *Perspektif : Jurnal Ilmu Administrasi*, *3*(2), 96–102. https://doi.org/10.33592/perspektif.v3i2.1540

Yanuardianto, E. (2019). Teori Kognitif Sosial Albert Bandura (Studi Kritis Dalam Menjawab Problem Pembelajaran di Mi). *Auladuna : Jurnal Prodi Pendidikan Guru Madrasah Ibtidaiyah*, *1*(2), 94–111. https://doi.org/10.36835/au.v1i2.235