

IMPROVING STUDENT LEARNING THROUGH AI: A CASE STUDY ON DIGITAL LEARNING PLATFORMS

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ABSTRACT

Students are greatly affected by the latest technological advances. Artificial intelligence, also called AI, is one of the most popular modern innovations. The purpose of this study is to use statistics to examine how Artificial Intelligence (AI) affects student learning. A total of 29 participants who were all Uinsu students participated in the quantitative analysis. Regression modeling, correlation analysis, and descriptive statistics were used to investigate the relationship between AI and student learning. The results obtained were with a significance level of 0.000, the simultaneous test results showed a calculated F value of 1.325. This indicates a fairly large simultaneous influence between the Artificial Intelligence variable (X) and the student learning variable (Y). If the partial test results show a calculated t value (4.738) greater than the t table (2.052), then H_a is accepted and H_0 is rejected. Student learning (Y) is significantly influenced by Artificial Intelligence (X) and the R-Square test, which produces an R^2 value of 0.811, Artificial Intelligence (X) has an influence of 81.1% on Student Learning (Y), while other elements not covered in this study have an influence of 19.9%. Regardless of the research findings, it is important to understand the benefits and drawbacks of artificial intelligence. If implemented correctly, artificial intelligence (AI) has the potential to be a useful tool to improve student learning outcomes and quality.

Keywords: Learning; Student; Artificial-Intelligence; Digital-Learning.

INTRODUCTION

The computer science discipline known as artificial intelligence (AI) is a field of computer science that focuses on the development of computer systems that are able to perform tasks that often require human intelligence. This concept encompasses a wide range of abilities, including verbal comprehension, visual perception, learning, reasoning, and problem-solving, (Maudy Nursyahida et al., 2024).

Advances in artificial intelligence have evolved to become an essential component of the modern global society. (Imran et al., 2024). As a developing country, Indonesia is not immune to its impact. Many aspects of life, including education, have been heavily influenced by artificial intelligence. The progress of Indonesian education has been aided by advances in artificial intelligence technology. The use of AI technology has greatly improved access to educational resources. Data analysis and natural language processing algorithms enable the processing of widely disseminated information sources quickly and precisely, (Aprianti et al., 2024; Zulfikar, 2023).

The transformation of digital learning through AI raises important questions about how this technology plays a fundamental role in the student learning process, one of which is cognitive effectiveness. Cognitive effectiveness refers to the ability of students to understand, manage, and apply information optimally in an academic context, (Putri et al., 2025; Wahyudinarti et al., 2024). Artificial Intelligence (AI) has several uses in higher education that can improve student learning. One of the most significant developments in contemporary education is the application of AI to provide a personalized learning experience. Teaching strategies known as "personalized learning" adapt to each learner's needs, learning preferences, and pace. For example, AI-based learning platforms can analyze student research data to generate assignments that meet standards and quality standards, provide students with faster feedback, and provide additional resources tailored to their individual needs, (Davis et al., 2024).

A collection of techniques known as artificial intelligence (AI) can be used to address a variety of problems in various domains, including education. Artificial intelligence (AI) as a substitute tool for students to solve problems in scientific paper assignments or in hands-on learning can have both beneficial and negative effects for students, (Zega & Batubara, 2024).

A more adaptable and efficient learning environment can emerge from the use of AI in higher education, especially when algorithms are used to analyze data and provide individualized learning opportunities, (Jiao, 2024). AI has the potential to revolutionize educational delivery through applications such as data-driven learning, adaptive learning, and personalized teaching materials. In addition to improving quality, it will give students access to a more relevant and inclusive learning environment, (Bhutoria, 2022).

AI's ability to make learning more accessible is one of the key benefits of its use in education. AI technology can be used to provide equal access to learning resources for students from diverse backgrounds, including those who live in rural areas or have physical limitations. Artificial intelligence (AI)-based learning platforms, such as chatbots and virtual tutors, allow students to receive learning assistance whenever they need it. This is important to encourage equal access to information and develop a more inclusive education system.

Students will continue to engage and use Artificial Intelligence (AI) once they gain access to this technology. Students can engage cognitively by creating a comprehensive experience with the material they have learned. Thus, students have more experience in using, applying, and detecting AI for information retrieval needs and are better acquainted with how to work with various AI technologies, (Katiyar et al., 2024; Owusu et al., 2024). Finally, the AI learning process by students can have an impact on increasing everyone's digital literacy level.

However, many students use AI inappropriately for learning. College students too often use and rely on AI to solve difficulties due to their dependence on it. Because of this dependency, students become less creative and less inclined to think critically, when students ignore their critical thinking skills in favor of quick solutions. People who overuse AI may become less creative and less curious about the learning process.

Student learning is the process of acquiring knowledge, skills, and attitudes through various learning activities designed and implemented in a higher education environment, to achieve learning goals. In other words, student learning is an organized effort to assist students in realizing their full learning potential, (Sahla Nasution et al., 2025).

Student learning, according to experts, is a process of interaction between students and their learning environment, including learning resources and educators, which aims to achieve learning

goals through the acquisition of knowledge, skills, and attitudes. This process involves thinking activities, information processing, and deliberate behavior changes, (Masruchan & Nurmilah, 2024)

The use of AI affects student performance in doing college assignments, it is relevant to prepare them to face a work environment that is increasingly dominated by technology. The use of AI can also assist colleges and educational institutions in developing more effective learning strategies, (Adewale et al., 2024). From the gap between theory and reality, many academics now prefer the widespread use of Artificial Intelligence (AI)-based tools to improve student learning. Students who understand these consequences will be better able to access a lot of information, but conducting academic research and information search using Artificial Intelligence can also pose a number of challenges. Therefore, the author would like to investigate this topic with the research title "Improving the Quality of Student Learning Through AI: Case Studies on Digital Learning Platforms"

Online-based learning in the implementation process is certainly inseparable from the use of various digital platforms. Types of Platforms that are commonly used include Google Classroom, WhatsApp, Email, Youtube, Zoom, Moodle, Google for Education, Quipper School, Rumah Belajar, Ruangguru, etc. The platform is used in the learning process which is carried out online or online. In addition, in online learning or online learning, of course, you must use software or hardware used to support the implementation of online learning, (Boateng et al., 2024). In reality, online learning still cannot be implemented properly due to various obstacles such as less supportive facilities, low economic conditions so that they cannot afford to buy quotas, geographical conditions that result in less stability of the internet network, lack of digital literacy of the community which results in online learning not running optimally, etc.

RESEARCH METHODS

The author uses a quantitative research design. Quantitative methods are research strategies that measure correlations between variables, test hypotheses, and explain phenomena using numerical data and statistical analysis. The main objectives of quantitative research are measurement, objective analysis, and generalization of results.

This architecture allows for the measurement of factors related to the influence of AI and how it affects student learning. Examining trends, patterns, and linkages in data is made easier with the application of quantitative techniques, especially surveys and statistical analysis. Students from the State Islamic University of North Sumatra are part of the research population. All study programs will be represented through the use of stratified random sampling techniques. To capture varied and representative viewpoints, the sample size was set at 29 individuals, which were divided evenly across strata. Version 29 of the Statistical Package for the Social Sciences (SPSS) will be used to analyze the data. The framework for this study can be seen in Figure 1.



Figure 1. Research Framework

RESULTS AND DISCUSSION

The results of the collection of data sources were produced through questionnaires and interviews conducted by researchers related to the influence of artificial intelligence on the learning of uinsu students, data was obtained as much as 29 data, and the data was managed with SPSS 29 regression methods to find out the influence between the two, the statistical results of the data can be seen as follows:

Validity Test**Table 1. Validity Test**

| Statement | r _{value} | r _{table} | Results |
|--------------|--------------------|--------------------|-----------|
| Statement 1 | 0,762 | 0,367 | Valid |
| Statement 2 | 0,840 | 0,367 | Valid |
| Statement 3 | 0,694 | 0,367 | Valid |
| Statement 4 | 0,615 | 0,367 | Valid |
| Statement 5 | 0,739 | 0,367 | Valid |
| Statement 6 | -0,057 | 0,367 | Not Valid |
| Statement 7 | 0,802 | 0,367 | Valid |
| Statement 8 | 0,844 | 0,367 | Valid |
| Statement 9 | 0,764 | 0,367 | Valid |
| Statement 10 | 0,386 | 0,367 | Valid |
| Statement 11 | 0,315 | 0,367 | Not Valid |
| Statement 12 | 0,288 | 0,367 | Not Valid |
| Statement 13 | 0,640 | 0,367 | Valid |
| Statement 14 | 0,555 | 0,367 | Valid |
| Statement 15 | 0,785 | 0,367 | Valid |

As mentioned below, the table can be read by comparing the calculated r-value with the r-value of the table.

1. A questionnaire question item is considered valid if the calculated r value is greater than the r of the table.
2. A questionnaire question item is considered invalid if the calculated r value is smaller than the r of the table.

Then, by comparing the Sig. (2-tailed) Value with the Probability of 0.05, it is clear that there are 12 valid questions in this study. In other words, a value of 0.05 is the probability limit (alpha) that determines whether a correlation between the item and the total score occurs significantly or is just a coincidence. Significant and positive correlations indicate that the item is worth using to measure the study variables.

Reliability Test

Reliability was assessed using Cronbach's alpha statistical test with 29 respondents. An instrument is generally considered reliable if its Cronbach's Alpha coefficient is greater from 0.6. The results of data reliability are as follows:

Table 2. Reliability Test

| Reliability Statistics | |
|------------------------|------------|
| Cronbach's Alpha | N of Items |
| 0,945 | 15 |

The reliability test showed a Cronbach Alpha score of 0.945, which indicates a very strong internal consistency for all components of the instrument. As a result, the questionnaire tool is considered trustworthy and suitable for use in the collection of study data.

UJI HYPOTHESIS

F test (Simultaneous)

Table 3. F Test

| | Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|------------|----------------|----|-------------|-------|-------------------|
| 1 | Regression | 2.556 | 2 | 1.278 | 1.325 | .000 ^b |
| | Residual | 54.020 | 56 | .965 | | |
| | Total | 56.576 | 58 | | | |

a. Dependent Variable: Pembelajaran Mahasiswa (Y)

b. Predictors: (Constant), Artificial Intelligence (X)

As can be seen in the following table, the results of the simultaneous test calculation show that the calculated F value is 1.325. as noted at a significance level of 0.000. This shows that the significance value of the simultaneous test of 0.000 is smaller than 0.05, which shows that the independent variable has a considerable combined influence, namely Artificial Intelligence (X) on the learning achievement variable (Y).

T Test (Partial)

Table 4. T Test (Partial)

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|-------|-----------------------------|------------|---------------------------|------|-------|-------------------------|-------|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 3.250 | .668 | .100 | 7.864 | .0936 | 1.069 |
| | Artificial Intelligence | .108 | .147 | | 4.738 | | |

a. Dependent Variable: Pembelajaran Mahasiswa (Y)

It is known that the t count obtained from the given table is 4.364. This value will be compared to the t-value of the table in the distribution table t. With the degree of freedom (df) = n (number of study samples) –k (number of study variables) = 29 – 2 = 27, and significance level (α) = 5% = 0.05, then the t-value of the table in the distribution table t is ± 2.052. From the above values, it can be seen that the value of t calculated (4.738) > t table (2.052) shows that Ha is accepted and H0 is rejected, then Artificial Intelligence (X) has a significant effect on Student Learning (Y) The results of this test are supported by research (Merentek, 2023) which states that AI can have a positive impact on student learning motivation because AI helps learning by providing quick information and assistance in understanding the material. Additionally, AI encourages writing creativity, improves student comprehension, and enables adaptive learning.

Determination Coefficient Analysis (R²)

Table 5. Determination Coefficient

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .213 ^a | .045 | .811 | .98216 |

The table above shows that the value of R² is 0.811. The ability of the independent variable, namely Artificial Intelligence (X), to influence the bound variable, namely Student Learning (Y) by 81.1% and 19.9% was affected by additional factors that were not included in this study.

The results of this study are supported by Research (Rahma et al., 2024) statement that the application of artificial intelligence (AI) in higher education has had a great impact, especially in improving student learning standards. AI enables more effective personalization of learning by customizing course content to meet the needs of each student. Furthermore, these technologies drive adaptive learning strategies, make education more accessible, and simplify administrative and assessment processes.

Findings supported by previous research and hypothesis test results show that artificial intelligence (X) has a positive and simultaneous impact on the dependent variable, student learning (Y). Most students view AI as a haven for finding answers to problems they encounter during lecture

sessions in the learning process. The impact of artificial intelligence on students is enormous. AI has had a significant impact on education, especially in terms of student learning outcomes, (Gea et al., 2025). Although AI is still sometimes abused today, it is still possible that future AI users will utilize it appropriately and correctly if continuous guidance and training are provided. One of the most common consequences of AI is that AI can change students' thinking processes, specifically by making material easier and faster to find, (Ayuningtyas et al., 2024; Cholvistaria & Gunawan, 2025). These skills can assist students in gathering and finding educational resources that make learning more effective.

Thus, the authors highlight the need to create ethics-based education programs, improve AI literacy, and implement monitoring approaches. With the right strategies, AI can be improved to facilitate efficient learning without sacrificing ethical and moral principles in education.

CONCLUSIONS

Simultaneous calculations show that the calculated F-value is 1.325. when analyzed at a significance level of 0.000. This shows that the significance value of the simultaneous test of 0.000 is smaller than 0.05 which shows that the independent variable has a considerable combined influence, namely Artificial Intelligence (X) on the learning achievement variable (Y). The partial test or t-test rejects H₀ and accepts H_a if the value of t (4.738) is greater than the t value of the table (2.052). This shows that Artificial Intelligence (X) has a significant impact on Student Learning (Y). The R² value, as determined by the Determination Coefficient Test or the R-Square Test, is 0.811. Artificial Intelligence (X) independent variables had an ability of 81.1% to influence the dependent variable of student learning (Y), while other variables not included in this study had an influence of 19.9%. Based on the results of all tests, AI greatly affects student learning at the State Islamic University of North Sumatra; However, it is important to understand its advantages and disadvantages. AI has the potential to be a powerful instrument to improve student learning outcomes and quality if used appropriately. However, it is also important to be aware of its pitfalls, which include reliance on technology, decreased social relationships, and possible prejudice in education. Therefore, it is important to guarantee that AI is applied in the field of education responsibly and morally.

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