
The Effect of the Use of AI on the Learning Achievement of High School Students

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ABSTRACT

Artificial intelligence (AI) has rapidly entered classroom practice and is widely believed to support students' learning processes. This study aims to empirically examine the relationship between the use of AI in learning and the academic achievement of secondary school students. The population in this study were all students of class XI and XII at a public senior high school in Sidoarjo as many as 310 students, and the total research participants were 175 students.

The sampling technique used was cluster random sampling. Data collection was carried out using an AI-usage scale and documented student learning achievement scores. Data analysis was performed using Pearson product moment correlation. The results showed a significant positive relationship between the use of AI in learning and student academic achievement, with a significance level (p) of 0.000. The use of AI contributes 14.9 percent to student learning achievement, so the remaining 85.1 percent is influenced by other variables. It can be concluded from this study that students' use of AI can predict students' academic achievement.

Keywords: Artificial Intelligence; Learning Achievement; Digital Learning; High School Students

INTRODUCTION

The development of digital technology has brought major changes in the world of education, one of which is through the presence of artificial intelligence (AI) (Alimuiddin, Juntak, Jusnita, Murniawaty, & Wono, 2023). AI comes with offering various conveniences in the learning process, ranging from the provision of personalized materials, virtual learning assistants, to automatic evaluation of student learning outcomes (Rifky, 2024). The use of AI in learning is believed to increase the effectiveness and efficiency of student learning at various levels of education, including at the secondary school level. This phenomenon has made AI one of the topics that have been widely studied in educational research in recent years (Hapsari, Ramadhani, & Ikramullah, 2025).

One of the indicators of the success of the learning process in schools is student learning achievement. Learning achievement reflects the extent to which students are able to master the subject matter that has been taught, which is usually measured through test scores, assignments, and report cards (Mediawati, 2010). Student learning achievement is influenced by many factors, both internal factors such as motivation and interest in learning, as well as external factors such as learning methods and the use of technology (Rafiqah, Yasmansyah, & Mayasari, 2013). The use of AI as a learning tool is suspected to be one of the external factors that also determine the achievement of student learning achievement in secondary school, because it can help students understand the material more independently and interactively (Ronsumbre, Rukmawati, Sumarsono, & Waremba, 2023).

Several previous studies have examined the relationship between AI and student learning aspects. Naila et al. (2023) found that the use of AI tools is related to students' learning motivation, while Syahputra, Situmorang, Manurung, Putri, and Tua (2025) show that AI plays a role in improving students' critical thinking skills. Research by Arai and Matsuzaki (2014) also suggests that the application of AI in education can have an impact on the academic achievement of students at various levels.

In addition, these findings also show that the use of AI is very relevant to support student learning achievements in the digital era (Dakhi, 2022). AI features such as educational games, interactive tests, and learning assistants play a crucial role in increasing student engagement during the learning process, as

students are actively engaged instead of just passively absorbing information. The use of AI allows students to get quick feedback on their work, so students can immediately correct mistakes in understanding the material. Each student has the opportunity to learn at their own pace and learning style through the help of AI (Farman, 2024). Students who consistently utilize AI in learning also tend to have a deeper understanding of concepts than students who study conventionally.

METHOD

The data in this study was collected using research instruments in the form of questionnaires. The scaling model used is the Likert scale model. The use of AI is revealed through the scale of AI use compiled by the researcher based on the dimensions of the use of AI in learning, namely: frequency of use, purpose of use, type of AI features used, and perception of the benefits of AI for learning. The student learning achievement is measured using documentation of student report cards in the current semester.

The population of this study is students in grades XI and XII at one of the State High Schools in Sidoarjo (310 students). A total of 175 students were the sample of this study, which was selected using the cluster random sampling technique. The results of the instrument test from 60 subjects on the AI use scale obtained a reliability coefficient (α) of 0.872 with a corrected item-total correlation that moved from 0.318 to 0.701. The valid and reliable items used for this study amounted to 18 items.

RESULT AND DISCUSSION

Table 1 shows that the results of the analysis obtained a value of $r = 0.386$, $p = 0.000$ ($p < 0.05$), which means that the use of AI is positively and significantly related to student learning achievement in secondary school. These results show that the hypothesis put forward is accepted, namely that the use of AI can predict student learning achievement. This is in line with several previous studies that found that the use of AI is positively related to student learning aspects (Ronsumbre, Rukmawati, Sumarsono, & Waremra, 2023). The use of AI contributes 14.9% to student learning achievement. Meanwhile, the remaining 85.1% was influenced by other variables. Other factors that also affect students' learning achievement include learning motivation (Rafiqah, Yushmanayah, & Mayasari, 2013), teacher competence (Mediawati, 2010), critical thinking skills (Syahputra, Situmorang, Manurung, Putri, & Tua, 2025), and student learning environment.

Table 1. Results of Pearson product moment correlation analysis

Variable	R	Rsquare	Sig.	r
Use of AI	0,386	0,149	P=0.000	0,386
Student learning achievement				

Previous findings show that the use of digital technology significantly affects student learning outcomes (Alimuddin, Juntak, Jusnita, Murniawaty, & Wono, 2023). The use of AI plays a role in helping students understand the subject matter and complete assignments more efficiently. Students who utilize AI believe that the tool can help them achieve better learning outcomes (Rifky, 2024). A study found that students who actively use AI tools tend to have greater motivation to learn (Naila et al., 2023). These students believe that they can change the way they learn to be more effective with the help of technology. Outstanding students tend to focus more on utilizing AI features to support their learning process. The use of AI is a form of technology utilization in education.

The use of AI can lead students to develop learning independence. Some high-achieving students claim that their success in learning is supported by the habit of utilizing AI as an additional learning resource, rather than relying solely on the teacher's explanations in class. Students with the habit of using AI tend to be more courageous to try to solve difficult problems independently. Students believe that they can understand the material better because they have access to additional explanations that are easy to understand. The use of AI can help students build self-study habits to gain information that supports their understanding of the subject matter. Students can develop their future learning strategies after getting used to managing the information obtained from AI (Dakhi, 2022).

Student learning achievement tends to increase when students are given access and guidance in utilizing AI-based learning technology appropriately. Students with a habit of using AI believe that their efforts in utilizing technology allow them to achieve success in learning (Farman, 2024). The use of AI is

an important form of technology utilization in learning. The use of AI can increase students' chances of achieving better learning achievement (Gultom, Darlin, & Marta, 2024). Students who have a habit of using AI consistently dare to try various new learning methods in the future (Muhammad, Andrian, Muhammad, Syaikul, & Faisal, 2024).

The implications of this study can provide insights, especially for high school students, regarding the continuous use of AI technology as a means of supporting to improve understanding and learning outcomes. The findings show that the proper use of AI in the learning process in schools tends to determine the success of students in achieving better learning achievements. Students who utilize AI wisely tend to have higher learning achievements. The results of this study are also beneficial for teachers. In addition to teaching subject matter, teachers are also responsible for guiding students in utilizing AI responsibly. Thus, students can maximize their learning potential through the use of appropriate technology.

CONCLUSIONS

The use of AI can be a good predictor of student learning achievement in high school. There was a significant positive relationship between the use of AI and student learning achievement ($p = 0.000$). The use of AI contributed 14.9 percent in explaining student learning achievement. Thus, the remaining 85.1 percent was influenced by other variables outside the scope of this study.

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