

UTILIZATION OF ARTIFICIAL INTELLIGENCE (AI) TO SUPPORT STUDENT LEARNING INDEPENDENCE

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Abstract

One of the most influential technologies in today's education world is Artificial Intelligence (AI). Students often use AI as an alternative to find out what they need. Furthermore, students often rely on AI to complete their assignments. The purpose of this study was to determine the level of student learning independence when utilizing AI while studying. The research method used was quantitative with a descriptive approach. The study took place at SMA Wiyata Dharma Medan, with a population of 245 students and a sample of 40 students. Data collection used questionnaires and document studies. The results showed that AI has positive benefits and a very high contribution to increasing student learning independence, with a score reaching 84.2%. This score indicates students' frequent use of AI to search for new materials, relevant references, complete assignments well and on time, and understand the subject matter. This positive use of AI indicates that SMA Wiyata Dharma Medan students have a high level of initiative in learning and motivation to learn independently in a disciplined manner. This learning independence is a sign that SMA Wiyata Dharma Medan students are capable of self-management, making decisions, and taking responsibility for themselves.

Keywords : *Learning independence; Artificial Intelligence ; AI in Education; Technology*

Introduction

World civilization is currently in the Industrial Revolution 4.0 phase, a digital era that has an impact on all aspects of human life, especially education (Halibanon, 2025; Hutagalung & Rachman, 2023). This era is marked by the emergence of various technology-based innovations. One innovation that stands out and has had a significant impact on the world of education is artificial intelligence (AI). AI is the process of mimicking human intellectual abilities implemented in machines through programmed computer systems. This technology plays a role in simplifying and increasing the effectiveness of human work, while also encouraging the development of critical and creative thinking skills to strengthen the quality of the educational process (Khurniawan et al., 2024; Siahaan et al., 2021).

Nowadays, the focus of education is no longer just transferring knowledge, but also on improving 21st century skills competencies, namely critical thinking, creative thinking, collaboration, and communication (Amir et al., 2024). Thus, the presence of AI shifts the learning paradigm towards a more effective direction because AI provides great opportunities for personal, interactive, flexible, and meaningful learning to improve 21st century competencies (Adiputra et al., 2025; Amalia et al., 2023). The presence of AI in various user-friendly learning platforms ensures students don't have to worry about accessing them. This convenience encourages student

independence in achieving 21st-century competencies, as AI offers efficiency and responsiveness to students' learning needs, regardless of space and time (Nugroho et al., 2025; Usman & Faradina, 2025).

The presence of AI indirectly shows that independence is the main key to student success in learning, because the theory of independence, according to Hurlock, states that students will be more capable of taking care of themselves, making decisions, and being responsible for their own actions both in learning and in living their daily lives (Hurlock, 1985). In line with this statement, previous research indicates that by utilizing AI, students can manage their own study time, be self-confident, make their own decisions, and be responsible and have a higher level of learning independence (Ardana et al., 2025; Hawa & Nasir, 2025; HS & S, 2024; Nugroho et al., 2025). This concept aligns with the Self-Regulated Learning (SRL) framework, which emphasizes that effective learners are those who actively set goals, monitor their own learning progress, and reflect on their outcomes. In the context of AI-assisted learning, SRL theory suggests that technology can serve as a scaffold that supports students in developing metacognitive strategies, self-motivation, and behavioral self-management (Chiu, 2024; Sardi et al., 2025).

However, besides these positive impacts, sometimes the use of AI has negative implications for students if it is used as a substitute for learning efforts, because this can trigger an attitude of dependence on AI (Khurniawan et al., 2024). Students' reliance on AI for learning without self-control can hinder the development of thinking skills and independence. As a result, students become lazy, less critical, dishonest (plagiarize), lack motivation to search for materials manually, lack good ethics, and take lessons lightly (Firdaus et al., 2025; Zakiyah et al., 2024). In fact, in this 21st century, independent learning has become a core competency that must be developed so that students are not only recipients of the benefits of technology (technology consumers), but also become digital citizens who are able to utilize AI wisely to develop their potential to the maximum.

The interesting description above prompted researchers to delve deeper into the use of Artificial Intelligence (AI) to improve student independence, particularly at Wiyata Dharma High School in Medan. This study aims to determine whether or not student learning independence improves when utilizing Artificial Intelligence (AI) in their learning process. This research certainly contributes to two areas: theoretical and practical. The theoretical benefit is to enrich educational studies in the fields of learning technology and student character development in the digital era. The practical benefit for researchers and students is to provide input on how to use AI wisely and foster students' learning independence. Furthermore, the practical benefit for teachers and the education sector is to provide input on how to effectively utilize AI in learning and in developing educational policies.

Research Methods

This study used a quantitative method with a descriptive approach. This study was conducted over a period of one month at SMA Wiyata Dharma Medan City. The population in this study was 245 students of SMA Wiyata Dharma Medan, with a sample size of 40 students. The sample determination was based on a random sampling technique, and the criteria were active students of grades X/XI/XII of SMA Wiyata Dharma Medan who utilize AI when studying. The researcher used tools and materials in the form of questionnaire sheets, stationery, and a camera from a mobile phone. Data collection techniques through questionnaire distribution and document study. The questionnaire distribution was carried out directly to students (the sample) to obtain primary data, while the document study was carried out by analyzing various literature relevant to the research study topic, such as journals, to obtain secondary data to enrich the analysis. The questionnaire instrument grid is presented in Table 1 below:

Table 1. Questionnaire Instrument Grid

Aspec	Indicator	No. Item
Initiative and motivation for independence	Higher initiative and motivation towards learning through Artificial Intelligence (AI)	1-5
	Complete tasks using Artificial Intelligence (AI) in a disciplined manner	21-25
Utilization of AI	Looking for new material and relevant references	6-10
	Complete tasks well and on time	11-15
	Understanding the lesson material	16-20
Amount		25

The data obtained through the distribution of questionnaires was then analyzed using data analysis techniques, namely the simple percentage statistical formula (Purwanto, 2012). The results of the data processing analysis were then transformed into respondent assessment qualifications in Table 2 below:

Table 2. Respondent Assessment Qualifications

Percentage	Criteria
80% - 100%	Very Influential/ Very High
66% - 79%	Influential/High
56% - 65%	Less Influential/ Low
< 55%	No Effect/ Very Low

Results and Discussion

Education currently occupies a position as the main pillar of the Industrial Revolution 4.0 (Hutagalung & Rachman, 2023). Therefore, one way to support the transformation of education towards greater progress is through the use of technology. The use of technology, particularly Artificial Intelligence (AI), in education is crucial for improving the quality of education and producing students as independent future generations. Independence, in this context, refers to students' skills in managing time, controlling, and directing themselves to complete tasks independently without relying on adults (Mulyadi & Syahid, 2020). Independence is very important for every student to have because independence is the foundation for student success in facing educational challenges in the future (Halim, 2022).

A research study conducted at Wiyata Dharma High School, Medan, demonstrated that the use of AI significantly contributes to the students' independent learning. The results of the data analysis on students' perceived initiative, motivation, independence, and AI utilization are presented in Table 3 below:

Table 3. Respondent Assessment Qualification Level

Aspec	Indicator	Percentage	Criteria
Initiative and motivation for independence	Higher initiative and motivation towards learning through Artificial Intelligence (AI)	89%	Very high 88% (Very Influential/ Very High)
	Complete tasks using Artificial Intelligence (AI) in a disciplined manner	87,5%	Very high
Utilization of AI	Looking for new material and relevant references	83%	Very high 81,5% (Very Influential/ Very High)
	Complete tasks well and on time	80,5%	Very high
	Understanding the lesson material	81%	Very high

Total Score: 84.2% (Very Influential/Very High)

From Table 3 above, it is known that the student response to the initiative and motivation aspects of independence was 88% with the criteria of very influential/very high and the aspect of AI utilization was 81.5% with the criteria of very influential/very high. The total percentage overall was 84.2% (very influential/very high). The results of data processing indicate that the existence of learning initiatives is an important characteristic of independent individuals, where many students often use AI to search for additional materials, understand lessons, check, and complete their own assignments. Furthermore, AI greatly encourages student motivation because it provides space for students to learn according to their absorption capacity. Students can use AI to understand the material without having to wait for teacher explanations. Thus, AI becomes a tool that accelerates the independent learning process so that learning is student-centered and less dependent on the teacher (Adiputra et al., 2025; Hutagalung & Rachman, 2023).

Furthermore, data processing results also show that AI helps students manage their study time more effectively. The use of AI enhances student learning independence through its user-friendly nature, which supports independent learning, decision-making skills in selecting AI resources, assists with time management, and allows for more optimal assignment completion (HS & S, 2024; Karyadi, 2023). In this way, students can feel in control of their learning outcomes, which ultimately increases their self-confidence and responsibility for themselves (Hurlock, 1985; Zakiyah et al., 2024). This explains that AI is able to help students develop the main aspects of independence, namely initiative, motivation, and responsibility.

Furthermore, to see a general comparison of AI's contribution to the learning independence of Wiyata Dharma Medan Senior High School students, all the processed data is then presented in the form of a round diagram in Figure 1 below:

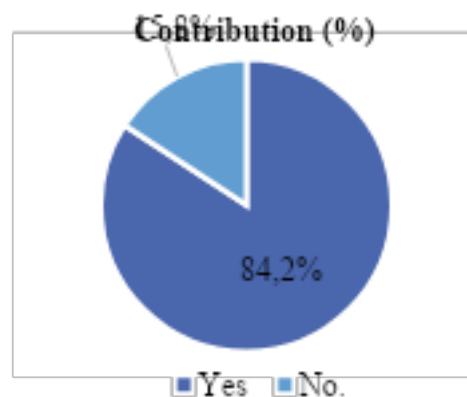


Figure 1. Percentage of AI Contribution to Student Learning Independence

The pie chart above shows the dominant "Yes" responses, with a total percentage of 84.2%, while "No" responses only reached 15.8%. This percentage suggests that many students strongly agree with the use of AI, which has significant implications and positive contributions to the learning process. Artificial Intelligence (AI) significantly impacts the learning independence of Wiyata Dharma Medan High School students. AI enables students to be more active, take the initiative to find their own learning materials, and become less dependent on teachers (Adiputra et al., 2025). Therefore, these results are relevant to Hurlock's theory of independence, which emphasizes that independence is the ability of students to take care of themselves, make decisions, and be responsible for themselves and not always depend on teachers (Hurlock, 1985).

Wiyata Dharma Medan High School students can manage their own study time and address any misunderstandings. The use of AI encourages students to manage their time, discipline

themselves, and delve deeper into the material to gain a better understanding and insight. Wiyata Dharma Medan High School students are also able to make their own decisions both in sorting information and references and in compiling and revising assignments. Furthermore, from the students' ability to manage themselves and make these decisions, Wiyata Dharma Medan High School students also demonstrate a high level of responsibility towards their assignments, both in terms of discipline/diligence in completing assignments and in maintaining honesty in assignments.

Conclusions and Recommendations

The use of Artificial Intelligence (AI) in learning has a significant impact and positive contribution to the learning independence of Wiyata Dharma Medan Senior High School students, particularly in terms of learning initiative, learning motivation, decision-making, and student responsibility, without having to rely on teachers. However, the use of AI by students still requires supervision from teachers to prevent negative effects such as dependency, laziness, and dishonesty in students. Therefore, it is important for teachers to guide students in using technology wisely in learning, so that students are not only passive users (technology consumers) but active, critical, honest learners, and able to adapt to the current developments in the digital era.

The increasingly rapid development of technology cannot be ignored, so education, as the vanguard, must be able to follow or even keep pace with these developments by producing a golden generation that is technologically literate and digitally literate. Therefore, suggestions for further research include a broader examination of the challenges and opportunities that may arise from the positive implementation of technology in the school environment on a sustainable basis, as well as identifying effective strategies for enhancing students' potential to compete in the future.

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