

THE IMPACT OF ARTIFICIAL INTELLIGENCE USAGE ON LEARNING EFFECTIVENESS AND ACADEMIC MOTIVATION AMONG UNIVERSITY STUDENTS

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ABSTRAK

The rapid development of artificial intelligence (AI) has increasingly influenced higher education, including the emergence of AI-based learning applications such as ChatGPT, DeepSeek, and Perplexity. While prior studies have examined the role of AI in general academic settings, limited attention has been given to its use within vocational, practice-based education, where learning outcomes are closely tied to technical skill development. This study aims to describe vocational students' perceptions of AI use in learning, particularly in relation to learning effectiveness and academic motivation, among students at a vocational institution in Palembang. A quantitative descriptive design using the survey method was employed, involving 50 respondents selected through purposive sampling based on their active use of AI-based learning applications. Data were collected through a 15-item Likert-scale questionnaire distributed online and analyzed descriptively using frequency and percentage distributions. The findings indicate that most respondents held positive perceptions of AI, particularly regarding its role in helping them understand lecture material, complete assignments more efficiently, and study independently. However, perceptions were more divided regarding the accuracy of AI-generated information and its contribution to time management, suggesting that the perceived benefits of AI are not uniform across all aspects of learning. Respondents also emphasized that AI cannot replace the role of lecturers. These findings suggest that, when used appropriately alongside critical thinking and lecturer guidance, AI is perceived by vocational students as a supportive tool for practice-based learning. This study is limited by its small sample size, single-institution scope, and reliance on self-reported data without inferential analysis, and future research employing larger samples, validated instruments, and objective learning measures is recommended.

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INTRODUCTION

The evolution of digital technology has impacted multiple sectors in our lives and the area of education is no exception. Furthermore, the few years AI is newly introduced and affected modern education greatly. Nowadays, students use books, of course, but they also cooperate with electronic assistants like Chat-GPT, Deepseek, Perplexity and other applications that act similarly – which is supported by research findings on the adoption of artificial intelligence when improving learning interactions (Holmes et al., 2019). AI-based systems that adapt to the learning spikes and dips of each individual student also offer more tailored support, making it possible for learning to be both individualized and efficient, which supports the idea that AI can also enrich human processes of learning (Luckin, r. 2018). Processes that used to be a labour of manual action (assessments being one example) can now be automatically carried out through complex software which reflects wider findings that indicate AI plays a role in transforming the structure by which higher education systems function (Zawacki-Richter et al., 2019). With support to students at any time, there is huge opportunity for innovation to reshape the future of learning at the higher education level.

To situate this potential within the specific setting of the present study, it is important to first clarify what distinguishes vocational higher education from general academic higher education. Vocational education places central emphasis on practice-based instruction, hands-on laboratory work, and the cultivation of technical competencies that prepare graduates for immediate workplace readiness, rather than primarily theoretical or research-oriented mastery (Zawacki-Richter et al., 2019). In this context, the adoption of AI carries a different set of implications than in conventional academic settings, since its value must be assessed not only in terms of conceptual understanding but also in terms of its contribution to hands-on skill acquisition and job-readiness outcomes, which remain the defining goals of vocational institutions such as those in Palembang.

Some research shows that Artificial Intelligence has a great influence on higher education learning effects and academic motivation of students (Zawacki-Richter et al., 2019) The use of AI is limited to personalized learning and automated assessment in which materials can be directed relative to individual abilities, thereby improving learning activities (Popenici & Kerr, 2017). As such, Holmes, Bialik and Fadel (2019) describe that AI-based adaptive learning systems can boost academic motivation by providing immediate feedback and helping students engage in highly interactive educational experiences. According to a study conducted by (Chen, Chen & Lin 2020), students' conceptual understanding and academic performance can benefit tremendously from AI-based learning systems. In addition, according to (Kumar & Boulanger 2020) platform integration of AI in the Online Learning approaches enhances student engagement which positively affect motivation and active participation. (Similarly, Hwang & Tu 2021) demonstrated that AI-based learning systems effectively improve the effectiveness of student learning and can assist students in maintaining motivation through personalized learning experiences. (Bond & Bedenlier, 2019) add further support to these

findings that AI-powered digital technology is conducive to enhanced student engagement, an important component of academic motivation. Additionally, (Luckin et al., 2016) highlighted that it has potential role as an always available learning assistant who constantly assists students, making the process more effective while increasing transparent intrinsic motivation. This is consistent with a recent qualitative study among Electronics Engineering students, which found that students generally perceive AI as a helpful tool that enhances learning effectiveness, helps them finish assignments more quickly, and makes course content easier to grasp, although they also remain aware of the risks of over-dependence and the ethical issues surrounding academic honesty (Daradespa et al., 2026).

These positive findings can be further understood through several theoretical lenses commonly used to explain technology-mediated learning. The Technology Acceptance Model (TAM) suggests that perceived usefulness and perceived ease of use determine whether students adopt and continue using AI-based learning tools, which helps explain why personalized and responsive AI features tend to generate stronger engagement. Self-Determination Theory (SDT) further offers an explanation for the motivational effects reported above, as AI systems that provide autonomy support, immediate feedback, and a sense of competence are theorized to strengthen students' intrinsic motivation. In addition, the concept of learning engagement provides a framework for understanding how behavioral, cognitive, and emotional involvement with AI-based tools translates into the effectiveness outcomes described in the studies cited above. Situating the present findings within these theoretical frameworks allows the relationship between AI use, learning effectiveness, and academic motivation to be examined not merely as an empirical pattern but as a process grounded in established explanatory models.

Apart from that, several previous studies have shown that the use of AI in education rarely produces positive impacts. (Selwyn, 2019) believes that the implementation of AI in education can reduce students' active involvement due to excessive connection to technology, and in the end can weaken critical thinking abilities. Apart from that, (Kirschner and De Bruyckere, 2017) discuss that irregular use of digital technology can hinder concentration and can even reduce learning effectiveness. Research by (Baker and Hawn, 2021) also shows that AI systems amplify algorithmic bias, which can influence unfair academic assessments. Apart from that, (Holmes et al., 2021) expressed concerns regarding the privacy of student data in AI-based systems which might cause behavioral problems in education. Meanwhile, (Chassignol et al., 2018) revealed that implementing AI without sufficient infrastructure and digital competence can make the learning process unproductive. Therefore, although AI has great potential to optimize the effectiveness of learning and encouragement, various risks and challenges need to be carefully considered in its implementation. Relatedly, a study among university students found that they themselves recognize clear ethical boundaries in AI-assisted academic work, identifying unreviewed copy-pasting, submitting AI-generated text without personal input, and using AI without understanding the content as unethical practices, even as they worry that excessive

reliance on AI could weaken their critical thinking and originality (Al Ghani et al., 2026).

Although many studies have discussed the impact of using AI on learning effectiveness and academic motivation among students, there are still gaps that need to be studied further. First, most existing research concentrates on academic universities in general, while vocational campuses such as the one in Palembang have different characteristics because they place more emphasis on practical skills and work readiness (Zawazki-Ritcher, 2019). This emphasizes the need for more specific research according to the vocational education context. Most of the studies cited above, for instance, were conducted in general or online university settings using survey or experimental designs aimed at measuring conceptual learning outcomes and engagement, but none of them examined how these dynamics unfold in a practice-oriented, laboratory-based vocational environment; this leaves open the question of whether the same relationships between AI use, learning effectiveness, and motivation hold when the primary learning outcome is technical skill rather than conceptual knowledge. Second, the integration of AI in practice-based learning is still underexplored. Previous research focuses more on the use of AI in theoretical or online learning, while vocational education is very much tied to practice, laboratories and improving technical skills (Holmes et al., 2021). Finally, the effectiveness of AI in optimizing change and AI motivation has, which could have an impact in higher education. There is still a lack of evidence regarding whether AI can actually deepen practical vocational skills (Luckin, R. 2018). Taken together, these three gaps in context, learning design, and outcome measurement indicate that the existing literature has not yet provided sufficient evidence on how AI functions within a practice-based vocational setting, which is the specific gap this study aims to address.

Therefore, this research focuses on the use of AI to increase the effectiveness of practice-based learning and academic motivation in the vocational student environment in Palembang, with the aim of filling important gaps in the existing literature. Specifically, this study aims to describe vocational students' perceptions of AI use in practice-based learning, including how AI is perceived to support learning effectiveness and academic motivation among vocational students in Palembang.

METHOD

This study employs a quantitative descriptive research design using the survey method. This approach was chosen because the study aims to describe how vocational students in Palembang perceive and experience the use of artificial intelligence (AI) in their learning process, particularly in relation to learning effectiveness and academic motivation. The survey method was considered appropriate as it allows for the efficient collection of data from a defined group of respondents within a relatively short period of time.

The population of this study consists of vocational students in Palembang who actively use AI-based learning applications, such as ChatGPT, DeepSeek,

Perplexity, or AI-integrated e-learning platforms, in their coursework. The sampling technique used is purposive sampling, as respondents were deliberately selected based on their active use of AI-based learning applications, rather than drawn at random from the general student population. A total of 50 students were involved as respondents in this study.

Data were collected using a self-administered questionnaire distributed online through Google Forms. The questionnaire consisted of 15 statements measuring students' perceptions of AI use in learning, covering aspects such as the use of AI for completing assignments and understanding lecture material, the accuracy and reliability of information provided by AI, the role of AI in supporting independent learning and time management, and the extent to which AI helps sustain motivation and interest in learning. Each statement was rated using a five-point Likert scale, ranging from Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), to Strongly Agree (SA).

The data obtained were analyzed descriptively by calculating the frequency and percentage of student responses for each statement across the five response categories. The results were then presented in tabular form to illustrate the overall pattern and distribution of student perceptions toward the use of AI in learning.

This study adhered to standard research ethics procedures. Prior to participation, respondents were provided with informed consent explaining the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time without consequence. All responses were collected anonymously, and the data obtained were used solely for the purposes of this research.

RESULTS AND DISCUSSION

RESULT

Table 1. Student responses to AI use in learning

Statement	SD	D	N	A	SA
The use of AI helps me understand lecture material	11 (22%)	4 (8%)	4 (8%)	11 (22%)	20 (40%)
AI helps me complete assignments faster	9 (18%)	7 (14%)	7 (14%)	10 (20%)	17 (34%)
AI improves the quality of my learning outcomes	11 (22%)	3 (6%)	9 (18%)	12 (24%)	15 (30%)
AI makes me more motivated to study	7 (14%)	11 (22%)	11 (22%)	7 (14%)	14 (28%)
AI helps me find relevant learning research	7 (14%)	10 (20%)	10 (20%)	7 (14%)	16 (32%)
Information provided by AI is accurate and reliable	10 (20%)	8 (16%)	5 (10%)	10 (20%)	17 (34%)

AI helps me understand difficult concepts	4 (8%)	17 (34%)	11 (22%)	6 (12%)	12 (24%)
I feel more independent in learning	7 (14%)	8 (16%)	3 (6%)	10 (20%)	22 (44%)
AI helps me manage study time more effectively	11 (22%)	6 (12%)	11 (22%)	11 (22%)	11 (22%)
I always recheck information generated by AI	7 (14%)	12 (24%)	8 (16%)	9 (18%)	14 (28%)
AI makes the learning process more interesting	7 (14%)	12 (24%)	8 (16%)	9 (18%)	14 (28%)
I depend on AI when completing assignments	10 (20%)	4 (8%)	11 (22%)	11 (22%)	14 (28%)
The use of AI improves my overall understanding	10 (20%)	4 (8%)	11 (22%)	14 (28%)	11 (22%)
AI cannot replace the role of lecturers	3 (6%)	4 (8%)	18 (36%)	9 (18%)	16 (32%)
I plan to continue using AI in the learning process	13 (26%)	4 (8%)	8 (16%)	10 (20%)	15 (30%)

DISCUSSION

Looking at Table 1, most students showed positive responses toward the use of Artificial Intelligence (AI) in the learning process. The findings indicate that AI helps students learn more effectively, efficiently, and independently. In this survey, the majority of respondents selected “Agree” and “Strongly Agree” for most of the statements provided. It should be noted, however, that these percentages reflect respondents' self-reported perceptions rather than measured learning outcomes; therefore, the findings are interpreted here as indicating that respondents tend to perceive AI as helpful to their learning process, rather than as definitive evidence that AI improves learning effectiveness or motivation.

For instance, statement 1, “The use of AI helps me understand lecture material,” received 40% in the “Strongly Agree” category, showing that AI assists students in understanding course materials more clearly. Similarly, statement 2, “AI helps me complete assignments faster,” obtained 34% “Strongly Agree” responses, indicating that AI improves students' productivity in completing academic tasks.

In statement 8, “I feel more independent in learning,” 44% of respondents strongly agreed, which suggests that AI encourages students to study independently and manage their learning activities more confidently. Moreover, statement 5, “AI helps me find relevant learning research,” gained 32% “Strongly Agree” responses, demonstrating that AI makes it easier for students to access useful academic information and resources.

Not all items, however, showed an equally strong pattern of agreement, and this variation is worth highlighting rather than overlooked. Statement 6, "Information provided by AI is accurate and reliable," received a comparatively dispersed distribution, with 20% of respondents selecting "Strongly Disagree" alongside 34% selecting "Strongly Agree," suggesting that students' trust in the accuracy of AI-generated information remains divided rather than uniformly positive. Similarly, statement 9, "AI helps me manage study time effectively," showed an almost even spread across all five response categories (22%, 12%, 22%, 22%, and 22%, respectively), indicating that AI's contribution to time-management skills is perceived far less consistently than its contribution to conceptual understanding or task completion. These patterns suggest that the perceived benefits of AI are not uniform across all dimensions of learning; students appear more confident in AI's role in supporting content understanding and task efficiency than in its role in fostering self-regulation or ensuring information reliability.

Additionally, statement 14, "AI cannot replace the role of lecturers," received 32% "Strongly Agree" and 36% "Neutral" responses. This shows that although students recognize the benefits of AI, they still believe lecturers play an essential role in guiding and supporting the learning process. The relatively high proportion of neutral responses on this item is itself notable, as it may reflect genuine ambivalence among students regarding the appropriate boundary between AI assistance and human instruction, rather than a firm consensus in either direction.

Overall, the results reveal that AI has a positive impact on students' learning effectiveness and academic motivation. AI is considered a helpful tool that supports understanding, increases learning flexibility, improves efficiency, and creates a more engaging learning experience for university students.

The results show that Artificial Intelligence helps students understand what they are taught in class easily and finish their homework faster. This finding is consistent with Holmes et al. (2019), who argue that AI can adapt to individual learning patterns and foster interactive learning experiences. They said that Artificial Intelligence can help students learn better because it can adjust to how they learn and make learning interactive. Also a lot of students said that Artificial Intelligence helps them learn on their own. They feel more confident because Artificial Intelligence can give them information and explanations whenever they need it.

Students also said that Artificial Intelligence helps them find the books and websites for their schoolwork and makes learning more fun. (Kumar and Boulanger, 2020) they said that using Artificial Intelligence in learning platforms can make students more interested and involved. There are Artificial Intelligence tools like ChatGPT, Deepseek and Perplexity that give students quick access to information, which can make learning easier and more efficient.

While these findings are broadly consistent with prior research conducted in general academic settings, they also extend that literature by situating it within a vocational, practice-based learning context. Unlike previous studies that examined AI use primarily in theoretical or online learning environments (Holmes et al., 2021), the present findings suggest that vocational students in Palembang perceive AI as most

helpful for tasks tied to practical productivity, such as completing assignments faster and locating relevant technical resources, while perceiving comparatively weaker support for self-regulated time management. This distinction indicates that the benefits of AI observed in general higher education contexts do not necessarily transfer uniformly to vocational education, where learning outcomes are more closely tied to applied skill performance than to conceptual mastery alone. This context-specific pattern represents a contribution of the present study to the existing literature, which has thus far paid limited attention to vocational learners.

However, some students are still worried, about using Artificial Intelligence in school. They are not sure if the information Artificial Intelligence gives them is correct. They often check it again. This concern echoes Selwyn (2019), who cautions that over-reliance on AI without critical verification may weaken students' critical thinking skills.

This concern is consistent with the divided responses observed for statement 6 regarding the perceived accuracy and reliability of AI-generated information, reinforcing the need for stronger digital literacy among students. Specifically, students' ability to independently verify AI-generated content, cross-check sources, and critically evaluate the credibility of information appears to be a necessary complement to AI use, rather than an optional skill. Without adequate digital literacy and verification habits, the convenience offered by AI risks fostering passive acceptance of information rather than active critical engagement, echoing the concern raised by Selwyn (2019). In this regard, lecturer guidance remains essential not only to preserve the role of human instruction, as reflected in students' responses to statement 14, but specifically to help students develop the evaluative skills needed to use AI responsibly within practice-based coursework. This concern is also consistent with a systematic review of AI in language learning, which identified accuracy and reliability issues as one of the most frequently reported drawbacks of AI use, underscoring the importance of cross-checking AI-generated content rather than relying on it uncritically (Ma'ruf & Tanjung, 2025).

Many students also said that Artificial Intelligence cannot replace their teachers. Even though Artificial Intelligence is helpful teachers are still important because they guide students explain things to them motivate them and talk to them directly. This aligns with Luckin et al. (2016), who argue that AI should be used to support teachers rather than replace them.

These findings carry several practical implications for vocational education. Lecturers may consider positioning AI as a supporting tool for specific, well-defined functions, such as helping students locate relevant technical references, providing preliminary practice on conceptual material before hands-on sessions, and offering first-pass feedback on assignments prior to instructor review. At the same time, given the divided trust in AI-generated accuracy observed in this study, institutions may need to establish clearer guidelines on the ethical use of AI in academic work, including expectations for verifying AI-generated answers and explicit limits on the extent to which AI-assisted work may substitute for independently performed practical tasks. Embedding these guidelines into practice-based coursework may help ensure that AI adoption strengthens, rather than substitutes for, the technical competencies that vocational education is designed to build.

CONCLUSION

The research and data analysis in Table 1 show that Artificial Intelligence has an effect, on how well students learn and how motivated they are to study. Most people who answered the questions said they Agree or Strongly Agree with the statements, which means Artificial Intelligence helps students in ways. It is important to note that these findings are based on descriptive frequency data reflecting students' self-reported perceptions rather than an inferential test of AI's effect on learning outcomes; accordingly, the results are more accurately interpreted as indicating that a majority of respondents hold a positive perception of AI use in learning, rather than as statistical evidence of a measurable effect.

Artificial Intelligence is helpful because it assists students in understanding what they are taught in class finishing their work faster finding the things to learn and learning on their own. Artificial Intelligence also makes learning fun and easy because students can study when they want and where they want. At the same time, not all aspects of AI use were perceived equally positively; responses regarding the accuracy of AI-generated information and its contribution to time management were considerably more mixed, suggesting that the perceived benefits of AI are uneven across different dimensions of the learning process rather than uniformly strong.

The research also shows that students still think teachers are important and Artificial Intelligence cannot take their place. So Artificial Intelligence should be used to help teachers and students not to replace them.

This study is not without limitations. The sample size was relatively small (50 respondents) and drawn from a single institution, which limits the generalizability of the findings to the broader population of vocational students. Data were collected entirely through self-report, which may be subject to social desirability bias and does not capture objective learning outcomes such as academic performance or task accuracy. In addition, the analysis relied solely on descriptive statistics, without inferential testing to statistically confirm the relationships between AI use, learning effectiveness, and academic motivation. These limitations should be taken into account when interpreting the findings of this study.

Future research is encouraged to address these limitations by employing a larger sample size drawn from multiple vocational institutions to improve generalizability, using a validated and psychometrically tested instrument, and incorporating objective measures of learning outcomes such as academic grades or task performance rather than relying solely on self-reported perceptions. Furthermore, subsequent studies may adopt a longitudinal design to observe changes in learning effectiveness and motivation over time, or an experimental design with treatment and control groups to more rigorously test

the causal effect of AI use on learning outcomes.

Overall this study shows that using Artificial Intelligence in education can make students learn better and be more effective when Artificial Intelligence can really help students if we use it correctly.

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