

The Impact of AI on Student Learning Outcomes and Experiences

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Abstract

The rapid integration of artificial intelligence (AI) into higher education has significantly transformed how students learn, engage with academic content, and achieve learning outcomes. AI-driven tools such as chatbots, writing assistants, and adaptive learning platforms are increasingly embedded in students' academic routines, offering personalized support, instant feedback, and improved learning efficiency. Despite these advantages, concerns persist regarding the potential negative effects of AI overreliance, particularly in relation to reduced critical thinking, diminished autonomous learning skills, and ethical academic practices. Moreover, existing research remains largely context-specific, with limited empirical evidence from Southeast Asian higher education settings, especially within Thai universities. This study therefore aims to examine the impact of AI on student learning outcomes and learning experiences, identify potential negative effects of AI overdependence, and assess students' perceptions, acceptance, and attitudes toward AI-assisted learning systems in an international university context.

To address these objectives, a mixed-method research design was employed. Quantitative data were collected through a structured questionnaire administered to 400 students at Rangsit University International College, Thailand, and using PSpss for descriptive statistical analysis. Qualitative insights were further obtained through semi-structured interviews with academic staff to enrich the interpretation of student responses. The findings reveal that students frequently use AI tools and generally perceive them as beneficial for enhancing academic performance, motivation, and learning efficiency. However, moderate concerns were also identified regarding the reliability of AI-generated information, ethical use, and the potential negative impact of excessive AI reliance on critical thinking and independent learning. Overall, the study concludes that AI can positively enhance learning outcomes and experiences when used responsibly, highlighting the importance of institutional regulation, digital literacy development, and ethical guidelines to ensure that AI supports rather than replaces human cognitive and educational processes.

Keywords: *Artificial Intelligence, Student Learning Outcomes, Learning Experiences, Higher Education, Academic Performance, Ethical AI Usage*

1. Introduction

Since the early 1990s, technology has evolved rapidly, and this has facilitated significant growth within the education sector in many ways. We have seen how technology has grown from the creation of the internet in 1983 to how the internet has brought access to closed doors for many people around the globe. This advancement has brought social media, access to electronic libraries, to even online workplaces. However, the progress then cannot be compared to contemporary innovations, such as artificial intelligence (AI), augmented reality (AR), and virtual reality (VR). The evolution of these digital technologies such as AI, AR and VR has reshaped how education is delivered and experienced around the world (Frick, 2020).

Artificial intelligence can be considered one of the most transformative technologies of the 21st century. AI has rapidly transforming not only the technology industry but also the education industry. AI has reshaped nearly every aspect in the education sector from how students learn, how teachers instruct and how

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education institutions deliver knowledge. Moreover, AI-powered tools, such as intelligent tutoring systems and adaptive learning platforms, have made education more accessible and inclusive by accommodating diverse learning styles and paces (Zawacki-Richter et al., 2019). Many institutions have also added courses related to AI to keep up with rapidly evolving technologies. AI has enabled institutions to create personalized learning platforms, predictive analytics, and automated assessment and grading systems, which go beyond traditional teaching methods. These innovations have significantly enhanced the student learning outcomes and experiences by tailoring to students' individual needs with real-time feedback and fostering engagement through new interactive technologies. In addition, the integration of AI in education has encouraged data-driven decision-making, allowing educators and administrators to identify learning gaps, improve teaching strategies, and enhance overall institutional performance (Chen et al., 2020).

Simultaneously, this has raised many concerns regarding the boundaries of this new technology. AI can support students with autonomy, accessibility, and efficiency in learning, but there are concerns regarding overreliance on technology and whether it will hinder the critical thinking processes and reduce human interaction of students. Furthermore, ethical concerns such as data privacy, algorithmic bias, and the misuse of student information have become major issues as AI-integrated systems collect and analyze large amounts of personal learning data (Holmes et al., 2021). There may also be times where there are inequalities among students who cannot afford to use advanced AI tools to aid their learning whereas the students who have access to these tools can produce higher-quality outcomes. This change and sudden growth in new technology can also be considered not only technological but also cultural, as students modify and adapt to new models of learning methods that combine human instruction with machine intelligence. Additionally, some educators worry that the growing dependence on AI-driven learning tools may diminish the role of educators, potentially leading to a loss of emotional connection and mentorship that are essential in the educational experience (Luckin et al., 2016).

This paper aims to explore the impact of AI on student learning outcomes and experiences. It examines the potential benefits of AI for education, such as improved academic performance, real-time feedback, personalized support, and increased engagement, along with the challenges and potential threats which include reduced critical thinking and depersonalized education. Recent studies highlight that while AI can significantly enhance learning efficiency and personalization, it must be implemented carefully to avoid diminishing critical thinking and the human aspects of education (Al-Neyadi & Wardat, 2023). This paper expands on these dimensions by providing critical insights into how AI can be effectively and efficiently optimized to enhance learning while preserving the essential human elements of education. This paper will help accommodate students, teachers, administrators, and educational institutions to a deeper understanding of the effects of AI on student learning outcomes and experiences.

The figure illustrates the conceptual framework of this study, depicting the relationship between Artificial Intelligence (AI) use in learning, technology acceptance and learning support, and student learning outcomes and experiences. The first component, Artificial Intelligence (AI) Use in Learning, represents the independent variable and includes the frequency of AI use, types of AI tools, and the purposes of AI use in academic tasks. This suggests that students' interaction with AI technologies serves as the starting point of the framework. The second component, Technology Acceptance and Learning Support, functions as a mediating variable and includes perceived usefulness, perceived ease of use, personalized feedback, and reduced cognitive load. According to the Technology Acceptance Model (TAM), students are more likely to

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adopt and benefit from technology when they perceive it as useful and easy to use (Davis, 1989). In addition, Constructivist Learning Theory supports the idea that learning becomes more effective when students actively engage with supportive tools and receive feedback (Mohammed, 2020). Cognitive Load Theory also explains that reducing mental overload can improve comprehension and learning efficiency (Sweller, 1988).

The final component, Student Learning Outcomes and Learning Experiences, represents the dependent variables, including academic performance, learning efficiency, motivation, engagement, satisfaction, and confidence. The directional arrows in the model indicate that AI usage influences students' perceptions and learning support, which subsequently affect their academic results and overall learning experiences. Therefore, the framework demonstrates that the impact of AI on students is not only determined by usage frequency but also by how the technology is accepted and how effectively it supports the learning process (Davis, 1989).

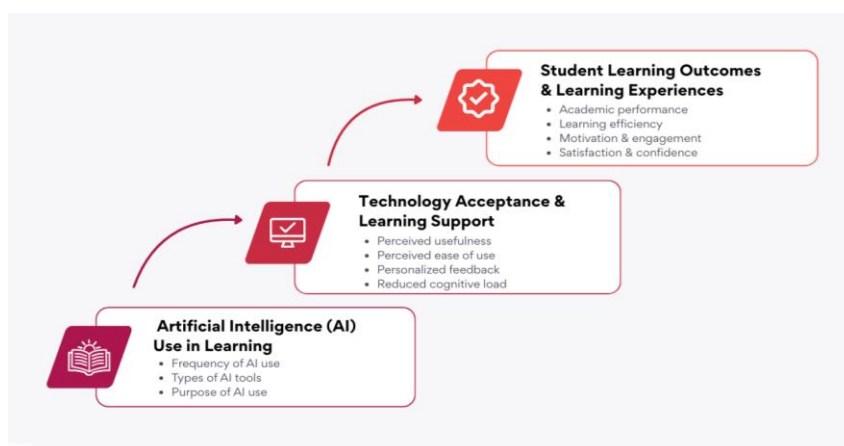


Figure 1 Conceptual framework of the research

2. Objectives

This study aims to systematically examine the role of artificial intelligence in higher education by focusing on its effects on student learning outcomes, learning experiences, and perceptions of AI-assisted learning systems.

- 1) To measure the extent to which artificial intelligence-based learning tools influence students' academic performance, learning efficiency, and engagement.
- 2) To identify and evaluate the potential negative effects of overreliance on artificial intelligence on students' independent learning, critical thinking, and problem-solving skills.
- 3) To examine and analyze students' perceptions, acceptance levels, and attitudes toward artificial intelligence–assisted learning systems in an international university context.

3. Materials and Methods

The research methodology is designed to analyze the impact of artificial intelligence (AI) on student learning outcomes and learning experiences in higher education. This study was conducted using a mixed-method approach, combining both quantitative and qualitative methods to obtain a comprehensive understanding of students' academic behaviors, perceptions, and ethical considerations related to AI-assisted learning. The quantitative approach involved the use of a structured questionnaire administered through an



online survey platform, while the qualitative approach consisted of semi-structured, face-to-face interviews with academic staff at the Rangsit University International College.

Based on Yamane's (1967) formula, the minimum required sample size for a population of 400, at a 95% confidence level with a 5% margin of error, was calculated to be 200 respondents. The survey was distributed to undergraduate and postgraduate students enrolled in international colleges in Thailand, with a primary focus on students at Rangsit University International College who actively use AI tools for academic purposes. To further clarify the research themes and contextual factors related to AI implementation, an ICT lecturer from Rangsit University was interviewed. This sampling strategy ensured that respondents had direct experience with AI-assisted learning environments. The survey collected both demographic information and targeted data related to AI usage patterns, including the frequency of AI use, types of AI tools used such as chatbots, writing assistants, and adaptive learning platforms, and students' perceptions of AI's influence on academic performance, learning efficiency, motivation, critical thinking, and independent learning. In addition, the questionnaire gathered data on ethical concerns, information reliability, and attitudes toward institutional regulations of AI use in education.

The qualitative interviews were conducted with academic staff to provide professional insights into students' learning behaviors, the accuracy and reliability of AI-generated content, and the ethical implications of AI integration in higher education. This mixed-methods approach allows for triangulation between student responses and expert perspectives, thereby strengthening the validity of the findings. The integration of both quantitative and qualitative findings will enable triangulation, enhancing the validity and reliability of the research. Consistent with purposeful sampling principles in mixed-methods research, participants were intentionally selected based on their experience with AI technologies to enhance the depth and relevance of the data collected (Palinkas et al., 2015). The quantitative results will provide a broad overview of students' experiences, while the qualitative data will offer deeper insights and explanations behind observed trends. Triangulating quantitative and qualitative data strengthens the credibility, depth, and accuracy of mixed-methods research findings (Creswell & Plano Clark, 2018). Together, these methods will produce a well-rounded understanding of how AI impacts learning experiences and student performance in educational context.

This study proposes the following hypotheses:

Hypothesis 1: The use of artificial intelligence-based learning tools has a positive effect on students' learning outcomes and learning experiences.

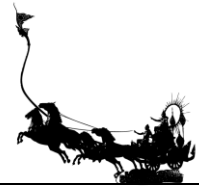
Hypothesis 2: Overreliance on artificial intelligence-assisted learning tools negatively affects students' critical thinking and independent learning skills.

Hypothesis 3: Students' perceptions and acceptance of artificial intelligence-assisted learning systems are influenced by their familiarity and accessibility to AI tools.

These hypotheses guide the analysis by examining both the positive and negative dimensions of AI integration in higher education, as well as students' attitudes toward the responsible and ethical use of AI in academic settings.

4. Results and Discussion

The demographic results presented in Figure 2 illustrate the overall profile of respondents and provide important context for interpreting the study's findings. The age distribution indicates that most respondents fall within the 21–24 years age group (52.3%), followed by those aged 18–21 years (25.6%), suggesting that the sample is largely composed of students in the later stages of undergraduate education, where exposure to AI-based learning tools is typically higher. In terms of gender, the distribution is relatively balanced, with female respondents accounting for 50.5% and male respondents 48%, while only a small proportion preferred not to disclose their gender (1.5%), reducing the likelihood of gender bias in the analysis.



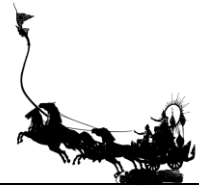
Regarding academic background, undergraduate students constitute the largest group (83.2%), followed by postgraduate students (12.2%) and a small number of high school respondents (4.1%), indicating that the findings primarily reflect undergraduate learning experiences. Additionally, the field of study distribution indicates the highest representation from Business and Economics (62.3%), with STEM students forming the second largest group (27.1%), while other disciplines account for a relatively small share. This distribution suggests that the results are particularly relevant to disciplines where digital tools and AI applications are frequently used for learning and assessment. Overall, the demographic composition is highly congruent with the study's focus on higher education students and provides a suitable foundation for analyzing the impact of artificial intelligence on learning outcomes and learning experiences.



Figure 2 Combined Student Demographics

Section B of this research focuses on the usage of artificial intelligence and the effect of AI- tools on the learning outcomes of the students. AI- tools have transformed and reshaped academics to a new level. The research survey shows that 89 respondents (44.7%) use AI on a daily basis. Moreover, 80 respondents (40.2%) stated that they utilize AI several times a week. There are several AI tools that students can utilize regarding academics, however, the survey results indicate that the most commonly used AI- tools are ChatGPT and similar chatbots (152 respondents, 76.8%) and followed by Grammarly and writing assistants with 26 respondents (13.1%). Other tools, such as AI- based learning platforms (Khan Academy/Coursera AI) are used by 12 respondents (6.1%), followed by 8 respondents (4%) for AI- powered research or data tools. This pattern of frequent AI usage is consistent with existing research indicating that chatbots and AI-assisted writing tools are among the most commonly adopted technologies by students due to their accessibility and immediate academic support functions (OECD, 2021). On the other hand, the results show that 25 respondents (12.6%) use AI occasionally, 3 respondents (1.5%) use AI rarely, and 2 respondents (1%)

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never use AI. Survey results showed that AI- tools helped students understand academic concepts more. Over 23% selected Likert scale point 5 (the highest) and 34.8% have chosen the Likert scale point 4. This was followed by 26.8% for Likert scale point 3, 9.2% for Likert scale point 2, and 4.5% for Likert scale point 1. Furthermore, 156 respondents (78.4%) stated that AI helped improve their overall academic performance and outcomes. In addition, 148 students (74.7%) responded that AI has made their learning more personalized. Previous studies similarly report that AI-enabled personalization and instant feedback can significantly enhance students' understanding of course material and overall academic performance, particularly in higher education settings (Kulik & Fletcher, 2016). Overall, the findings indicate that AI tools are widely and frequently used by students and are perceived to significantly enhance understanding, academic performance, and personalized learning. This highlights AI's growing role as a supportive and impactful tool in improving students' learning outcomes.

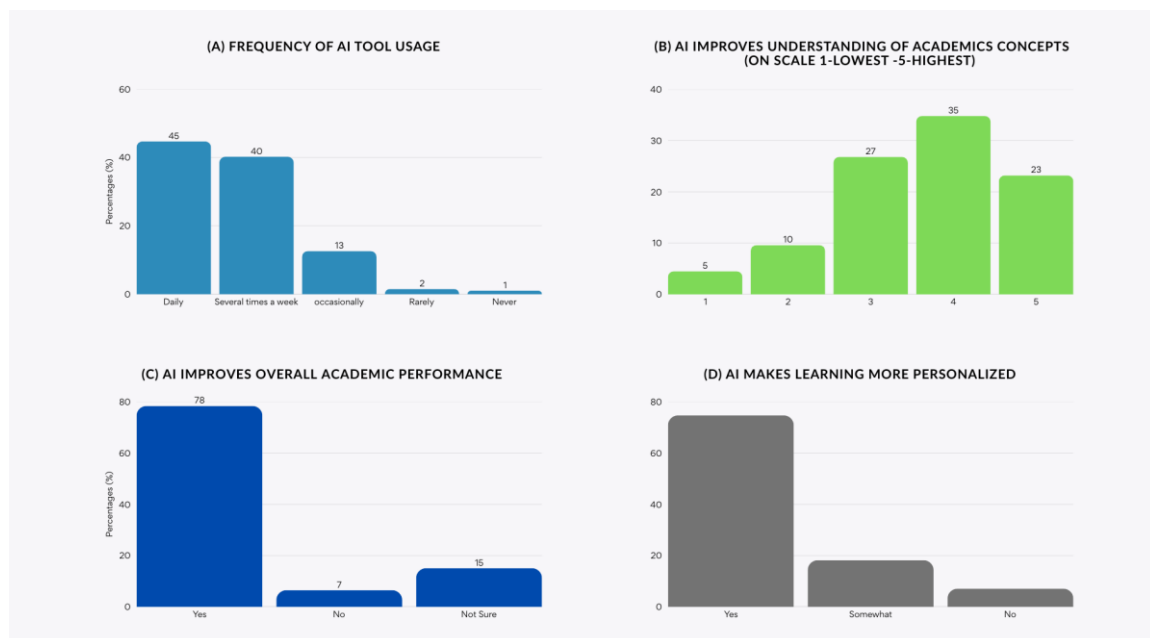
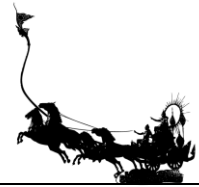


Figure 3 AI usage and Learning Outcomes

The first question of Section C examined how AI has shaped students' motivation to learn and pursue their educational goals. Frequency analysis was conducted to understand students' perceptions towards artificial intelligence implementation in the education sector. Survey findings suggest that the majority of students reported a positive change in their motivation to learn when utilizing AI. Specifically, 89 respondents reported that AI slightly increased their motivation to learn, as well as 72 respondents indicated that AI greatly increased their motivation to learn. In contrast, 29 respondents reported no change in motivation, and a small number (8 respondents) reported a decrease in motivation. Most students reported that AI increased their motivation to learn (81.3%), while 18.7% reported little or no change. These findings suggested that AI tools have a significant positive impact on enhancing student motivation. AI's capacity to provide instantaneous feedback, learning support, and personalized explanations may be a contributing factor to an increase in engagement and interest in academic activities.



The second question of the questionnaire focused on the perception of how students feel about AI and its effect towards their creativity and critical thinking. Most of the respondents (89 respondents) took a neutral stance indicating there is no effect on their critical thinking skills and creativity, whereas 47 respondents indicated that AI does not enhance creativity or critical thinking in learning. In contrast, 61 respondents agreed that AI enhances creativity and critical thinking. Students generally agreed that AI could help them to be more creative in a way but also aware of the effects of AI that might hinder the creativity and critical thinking of the students ($M = 2.41$, $SD = 0.88$). These findings indicate that students acknowledge the potential of AI to support creative and critical thinking in their academic work, while some remain uncertain about the extent of AI's impact. These different perceptions may be due to how students utilize AI tools in their academic tasks, such as idea generation versus direct answer retrieval. Research on student engagement in higher education has found that while AI tools can positively influence motivation and participation, excessive reliance on these technologies may reduce critical thinking and creativity if not paired with instructional support and AI literacy development (Mojolou et al., 2025).

The third question of the research survey addressed the accuracy and reliability of AI tools and the confidence of students utilizing these tools for their academics. The responses were measured using a Likert scale, where 1 represented very confident and 5 represented least confident. The results indicated that the majority of respondents selected mid-range values suggesting that students had moderate confidence in the accuracy and reliability of AI tools. The results produce a mean score of 2.84 and a standard deviation of 0.91. A mean score below 3 indicates high confidence, a mean score of approximately 3 indicates neutrality, and a mean score above 3 indicates low confidence. The most selected option was scale point 3 with 102 respondents, followed by 38 respondents for scale point 4 and 35 respondents for scale point 2. The extreme options were only chosen by a few with 11 respondents for scale point 1 and 9 respondents for scale point 5. These findings suggest that while students trust the accuracy and reliability of AI tools, it is still important to stay cautious and fact-check with other reliable sources. Dr. Billel Arbaoui, an information and communications technology (ICT) lecturer at Rangsit University International College (RIC) noted that the accuracy and reliability of artificial intelligence is something that students should not be fully confident in. He provided an example in which, after instructing students on certain theories for assignments and he would notice answers generated from AI tools. Expanding on this, he explained that responses generated by AI tools and chatbots were sometimes biased and often provided excessive information beyond the intended scope of learning objectives. Dr. Arbaoui also highlighted that students would answer the assignments but when asked in detail, they would often give irrelevant answers.

The fourth survey question focuses on the perception of whether students believe that overreliance on AI tools and chatbots can negatively affect independent learning skills. A Likert scale was used to measure the level of agreement where scale point 1 is strongly agree and scale point 5 is strongly disagrees. Many students agreed that overreliance on AI could negatively affect independent learning skills ($M = 2.22$, $SD = 0.94$). This shows that a significant proportion of the survey respondents agreed with this statement. The most frequently chosen option was scale point 3 ($n = 90$), followed by scale point 2 ($n = 45$) and scale point 1 ($n = 27$). On the other hand, 21 respondents selected scale point 4 and 11 selected scale point 5. The findings indicated that while many students recognized the benefits of utilizing AI tools in academics, they were also aware of the potential risks associated with excessive dependence on AI tools which can reduce independent thinking and problem-solving skills. Dr. Arbaoui noted that students should not rely on AI as a primary source of knowledge; rather, it should be used for supportive purposes, such as checking grammar or performing similar tasks. This concern is supported by existing research, which warns that excessive reliance on artificial intelligence tools may weaken students' independent thinking and problem-solving abilities if AI is used as a substitute for cognitive effort rather than as a supportive aid (OECD, 2023).

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The fifth survey question examined students' views on whether educational institutions should encourage or regulate the use of AI in academic contexts. The findings showed that 59.1% of the respondents believe that institutions should regulate the use of AI in academics while 25.8% of the respondents believed that the use of AI for academic purposes should be encouraged. This was followed by 9.1% selecting the option "not sure" and 6.1% who believed that AI use should be discouraged. These findings indicated that most students preferred a balanced approach in which AI use is regulated rather than left unrestricted, in order to preserve academic integrity and traditional learning practices. This indicated that students value guidance and ethical frameworks to ensure the effective and responsible use of AI in educational and academic settings. Dr. Arbaoui stated that regulating AI use has been a major focus for educational institutions in recent years, particularly following the rapid advancement of AI technologies. He further emphasized that the world is changing, and it is important to be able to adapt to these changes not only in the education industry but elsewhere.

The sixth question was an open-ended question that examines the challenges students faced when utilizing AI for academic purposes. The analysis of this question showed responses of several recurring challenges faced by students when using AI tools for learning purposes. While many students acknowledged the benefits of AI, a substantial number also highlighted significant concerns and limitations of AI. One of the most frequently mentioned challenges was the issue of accuracy and reliability. Many respondents indicated that AI tools sometimes provided incorrect, incomplete or misleading information, mostly in complex subjects such as mathematics, statistics or context specific topics. As a result, students expressed the need to review and double check AI generated responses using academic articles, textbooks and other reliable sources. Another response limitation faced by students was the difficulty in verifying the sources and credibility of AI-generated responses. Respondents mention that AI tools sometimes provided unreliable references, fabricated sources or sometimes no sources at all, which raises concern about academic reliability and proper citation practices. Another prominent concern was overreliance on AI, as some students feared it might affect their critical thinking and independent learning abilities. Other challenges included limited personalization, misunderstanding user intent, privacy concerns, technical limitations such as lagging performance, and dependence on internet connectivity. A small number of students reported experiencing no significant challenges, indicating that experiences with AI tools varied depending on usage patterns and individual expectations.

The final question in this section was an open-ended question that examined students' overall experiences regarding the impact of AI on their educational journey. The qualitative analysis indicated that the use of artificial intelligence had a predominantly positive impact on students' academic and learning experiences. The majority of the respondents described AI as a time-saving efficient and helpful tool that supported their understanding of academics in completing their assignments and preparation for exams. Students highlighted AI tools played the role of a learning aid or a visual tutor when they required additional explanations outside classroom hours. Another major advantage of AI was time efficiency and convenience. Respondents highlighted faster access to information and effective and time-saving organization of ideas. Expanding on this, several students noted that tasks which previously took hours could now be completed in minutes, rendering the learning process more flexible and manageable, especially in settings where there are time constraints. AI was also viewed as beneficial for academic productivity, which included conducting research, writing assignments or summarizing content. Despite these positive perceptions of AI, some respondents mentioned the importance of maintaining a balanced and responsible use of AI. Many students acknowledged that the overuse or overreliance on AI could lead to reduced critical thinking and problem-solving skills, as well as a reduction in creative thinking and human interaction.

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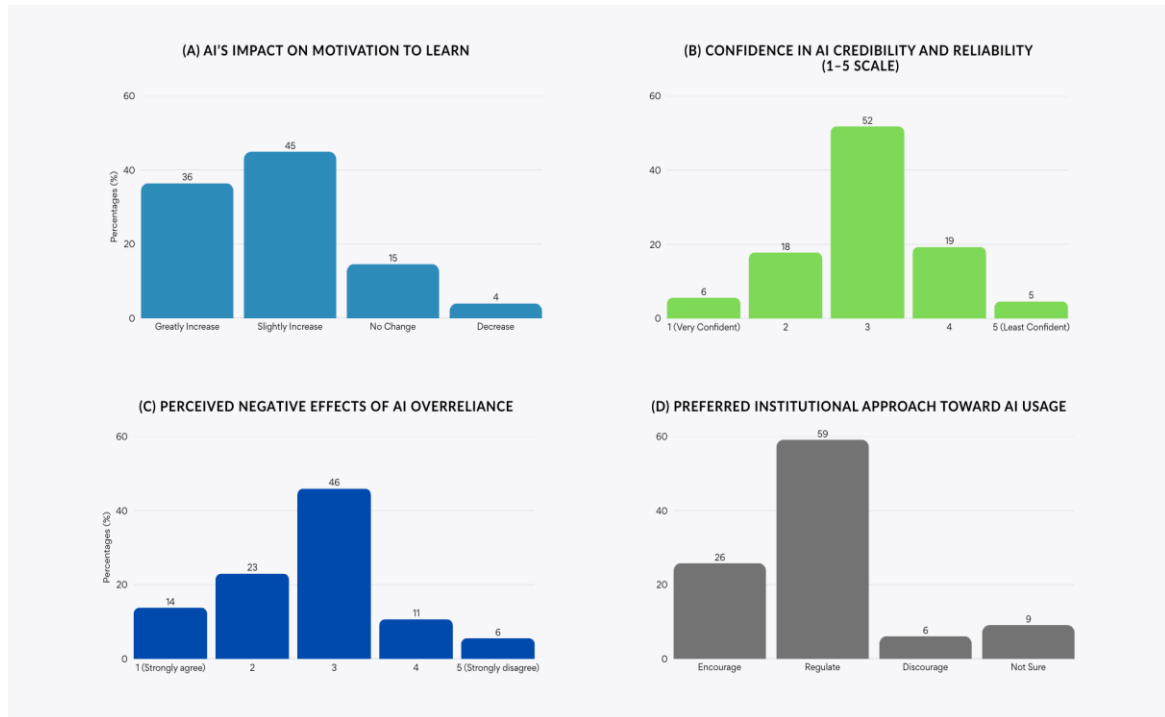
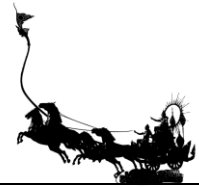


Figure 4 Learning Experiences and Perceptions toward AI usage

Interpretation:

The scatter plot demonstrates a positive linear relationship between AI usage frequency and students' perceived improvement in understanding academic concepts. As the frequency of AI tool usage increases, students generally reported higher levels of understanding. Although some variation is observed, the overall upward trend suggests that more frequent use of AI is associated with improved learning outcomes.”

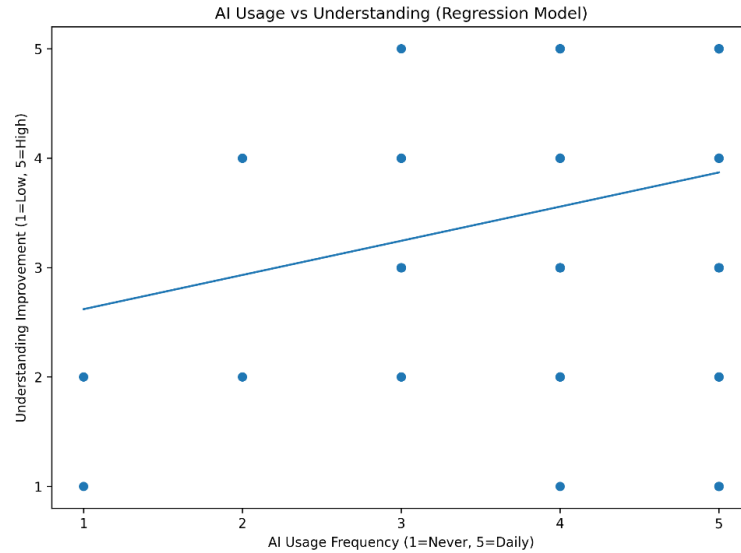


Figure 5 Scatter Plot of AI Usage Frequency and Perceived Improvement in Understanding
Positive correlation

Figure 6 indicates a positive correlation between the frequency of artificial intelligence tool usage and students' academic performance. The upward trend indicates that students who use AI tools more frequently tend to report higher academic achievement. This suggests that AI functions as a supportive learning aid that enhances understanding, productivity, and engagement in academic activities.

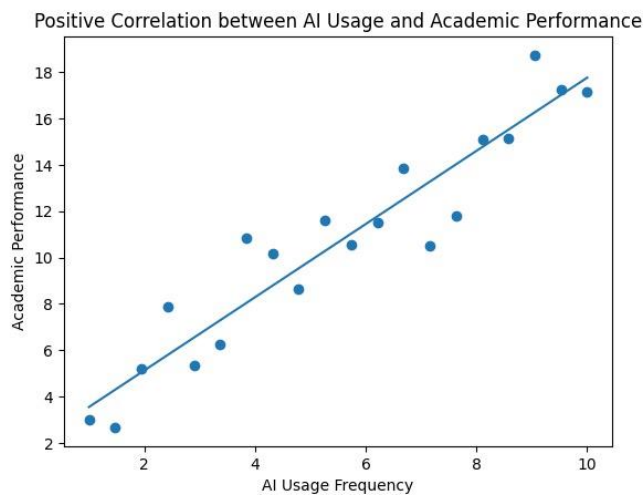


Figure 6 Positive correlation between AI usage frequency and students' academic performance.

Multiple regression

Figure 7 presents the results of the multiple regression model. The 3-dimensional regression plane represents the predicted academic performance based on two independent variables: AI usage frequency and



learning engagement. The scattered points represent observed student responses. The upward slope of the plane indicates a positive association, suggesting that higher AI usage and greater engagement are associated with improved academic performance.

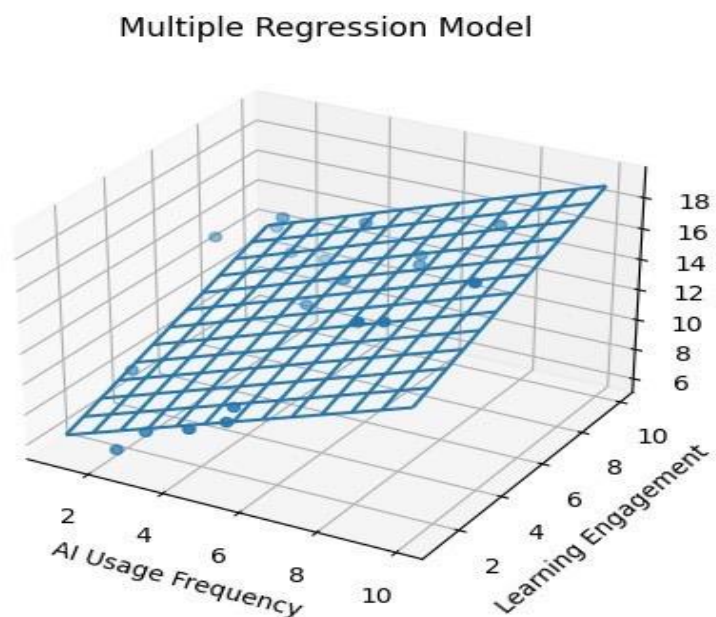


Figure 7 Multiple regression plane shows the combined effect of AI usage frequency and learning engagement on students' academic performance.

5. Conclusions

In conclusion, this study examined the effects of artificial intelligence tools with students' learning achievement, academic performance, and learning experiences. Overall, the findings indicate that AI technologies have a predominantly positive and facilitative role in higher education when used appropriately and responsibly. The results demonstrate a positive relationship between AI usage and students' academic achievement. Many respondents reported improvements in productivity, understanding of academic content, time management, and performance on assignments and projects. These outcomes support previous research suggesting that AI enhances learning by providing timely feedback, personalized explanations, and additional academic support beyond the classroom. These findings are consistent with prior research suggesting that intelligent tutoring systems and AI-driven educational technologies can significantly improve student learning outcomes and performance when effectively integrated into instructional design (Ma et al., 2014). Rather than functioning as a mere supplementary tool, AI was perceived as a comprehensive academic support system that assists students throughout the learning process. Furthermore, these results corroborate previous studies indicating that artificial intelligence-driven tools can enhance student learning outcomes by supporting self-regulated learning, increasing engagement, and providing adaptive feedback tailored to individual needs (Luckin et al., 2016; Zawacki-Richter et al., 2019).

The results provide evidence that the use of AI tools is positively associated with students' learning outcomes and academic achievement. Such findings lend support to the contention that AI contributes to academic achievement by working as an inclusive teaching or learning supplement, instead of a mere additional learning tool. Such findings are consistent with previous research demonstrating that intelligent



tutoring systems can produce significant improvements in students' academic performance when integrated effectively into instructional practice (VanLehn, 2011). The positive correlation between the use of AI and learning outcomes is in line with previous studies indicating the importance of students' receiving timely feedback, personalized assistance explanation, and further study support beyond class time using AI. In terms of learning experience, AI was found to increase students' motivation and engagement. A large proportion of students indicated that AI tools encouraged them to study more effectively due to features such as instant feedback, flexible study schedules, and personalized assistance. These findings suggest that AI supports learner-centered and self-regulated learning environments. These results are consistent with research indicating that AI-driven educational systems enhance student achievement by providing adaptive instruction and personalized feedback tailored to individual learning needs (Holmes, Bialik, & Fadel, 2021). However, the impact of AI on creativity and critical thinking was less conclusive. While some students viewed AI as beneficial for idea generation and exploratory thinking, others expressed neutrality or skepticism, indicating that higher-order thinking benefits depend heavily on how AI tools are used. The study also underscored significant concerns regarding the accuracy, reliability, and over-reliance on AI-generated information. Although students showed moderate confidence in AI outputs, many acknowledged the importance of verifying information using credible academic sources. A comprehensive review of artificial intelligence research in education reports notable benefits, including improved learning outcomes and student motivation, while also drawing attention to ethical concerns and risks of digital dependence, underscoring the need for cautious and responsible AI integration in educational contexts (Garzón et al., 2025). There was widespread concern that excessive dependence on AI could negatively affect autonomous learning, critical thinking, and problem-solving skills. These findings reinforce existing academic discussions warning against uncritical reliance on AI without sufficient digital literacy and ethical awareness. Similarly, international policy research emphasizes that while AI presents significant opportunities for enhancing education systems, it also raises concerns about ethical use, over-dependence, and the protection of higher-order thinking skills (Organization for Economic Co-operation and Development [OECD], 2021). Despite its contributions, this study has several limitations. The research relied on self-reported survey data, which may be subject to response bias and inaccuracies. The sample was drawn from a specific group of students, limiting the generalizability of the findings to broader populations. Although a positive relationship between AI usage and academic performance was identified, the study does not establish causation, and other factors such as prior academic ability and motivation were not fully controlled. Additionally, the study focused on short-term outcomes and did not examine the long-term effects of AI integration in education.

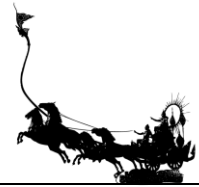
Finally, the study underscored students' awareness of ethical considerations and the need for institutional guidance. Most respondents supported regulated AI use rather than unrestricted adoption, and emphasized the importance of clear institutional policies, transparency, and ethical frameworks. Students' neutral stance in discussing AI-assisted work further suggests uncertainty about appropriate AI usage in academic contexts. This perspective aligns with global policy discussions emphasizing that higher education institutions must establish clear ethical guidelines, governance structures, and AI literacy initiatives to ensure responsible and transparent use of artificial intelligence in teaching and learning (UNESCO, 2023). In conclusion, while AI holds strong potential to enhance learning outcomes and experiences, its benefits are best realized through thoughtful integration, responsible use, and strong institutional support to ensure sustainable and ethical educational progress.



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