



Artificial Intelligence in University Learning: Student Usage Patterns, Perceived Impact, and Ethical Considerations

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Abstract

Background and Aim: This study investigates the impact of artificial intelligence (AI) tools on students' learning experiences in higher education, emphasizing awareness levels, usage patterns, perceived learning outcomes, attitudes towards AI integration, and related challenges.

Materials and Methods: A total of 200 students from Universiti Teknologi MARA, representing diploma, undergraduate, and postgraduate programmes, participated in a structured survey. The research instrument consisted of four principal dimensions: (1) awareness and utilization of AI tools, (2) perceived influence on learning, (3) attitudes towards AI in higher education, and (4) challenges and ethical considerations.

Results: The results show that students were very familiar with AI applications and often use tools like generative AI, language models, and productivity applications for academic purposes. Students generally reported positive learning impacts, including enhanced understanding of complex topics, greater efficiency in academic tasks, improved motivation, and better management of workload. Respondents expressed strong acceptance of AI as a learning support tool and acknowledged its utility, indicating similar positive attitudes toward its adoption. Despite these benefits, students also identified concerns related to accuracy, bias, plagiarism risks, and the need for clearer institutional guidelines to support responsible use.

Conclusion: Overall, the study shows how AI is increasingly being incorporated into academic settings at universities and emphasizes how crucial it is to improve ethical governance and AI literacy in order to guarantee successful and responsible adoption.

Keywords: Artificial Intelligence in Education, Generative AI, AI Tool Usage, AI Literacy, Ethical and Academic Integrity Issues.

Introduction

Artificial Intelligence (AI) is progressing rapidly, transforming numerous industries, including education. Artificial Intelligence significantly influences students' academic development in both primary and tertiary education by offering numerous opportunities and challenges (Asongo & Akuse, 2024). Artificial intelligence possesses the capacity to revolutionize education by addressing diverse student needs, ranging from personalized learning experiences to intelligent tutoring systems that provide tailored guidance, support, and feedback according to individual learning patterns and knowledge levels (Godwin-Jones, 2022). Nevertheless, the application of advanced AI technology by itself does not guarantee positive educational results (Lalira et al., 2024).

Artificial intelligence (AI) has fundamentally altered the educational landscape, resulting in unprecedented changes in instructional methodologies and student learning outcomes (Pikhart, 2025). Artificial intelligence can improve educational outcomes, streamline teaching processes, and tailor learning materials to accommodate individual requirements through data-driven machine learning methodologies (Vorobyeva, 2025). The application of AI in education offers a feasible pathway to more personalized instruction and improved academic performance. Comprehending the implications of AI is crucial for educators, policymakers, and AI platform developers, particularly in the context of open and distance learning (ODL) (Dele et al., 2024).





Important concerns about equity, accessibility, and the changing role of conventional teaching techniques are raised by the use of AI in educational settings. AI has a profound and wide-ranging impact on education. By customising instructional materials to each student's specific requirements, AI makes personalised learning possible (Otermans et al., 2025). Research has demonstrated that students in individualised learning settings had higher levels of self-efficacy and a more optimistic outlook on their education (Dele et al., 2024). AI-driven technologies that evaluate enormous volumes of data to find learning gaps and adjust interventions accordingly are making these experiences more and more attainable (Wu et al., 2025).

Even with these developments, integrating AI into education presents important concerns regarding how well it fits with accepted learning theories. Few studies specifically examine the many roles of AI and how they relate to instructional frameworks, despite the fact that many have examined difficulties, barriers, and prospects (Dong et al., 2025). There are difficulties in using AI in education. A deep comprehension of both the technology and the learning process is necessary for the successful integration of artificial intelligence in education. Ethical issues add to this complexity, particularly in light of the growing application of generative AI (Hassan, 2024).

Objectives

1. To describe awareness and frequency of AI use
2. To examine the perceived impact of AI on learning
3. To analyse attitudes toward AI in higher education
4. To identify perceived challenges and ethical concerns.

Literature review

AI comprises a number of technologies, including machine learning, deep learning, and natural language processing, which enable computers to do tasks traditionally associated with human cognitive abilities (Lalira et al., 2024). The pervasiveness of AI continues to develop, driven by technological progress and societal needs, as demonstrated during the COVID-19 pandemic, which drove the adoption of AI solutions in several industries (Yasin et al., 2023). As AI continues to advance, its revolutionary potential brings both exceptional benefits and substantial difficulties, affecting the ways individuals, companies, and communities work in an increasingly digital environment (Vieriu, 2025).

The use of generative AI (GAI) in higher education has the potential to change a number of teaching, learning, and evaluation strategies (Chiu, 2024). According to recent research, GAI has a variety of capabilities, such as offering thorough feedback (Godwin-Jones, 2022), outperforming the typical student in reflective writing (Khalifa & Albadawy, 2024), improving multimedia learning (Khetan, 2025), and being a pioneer in the creation of adaptive educational content (Chiu, 2024). Despite these developments, worries about the "digital divide" have emerged, emphasizing how unequal access to these technologies could widen educational gaps (Brown et al., 2025). Furthermore, the possible dependence on AI raises concerns regarding its impact on students' independence, creativity, and critical thinking. In light of these challenges and opportunities, the role of institutional policies becomes critical in navigating the integration of AI within higher education (Jin et al., 2025).

These worries are supported by new empirical research. Bittle and El-Gayar (2025) reported that students who frequently rely on generative AI tend to display less interest in deep learning and are less likely to apply critical analysis, especially in novel or ill-structured assignments. The contextual nature of AI's educational influence is highlighted by a recent meta-analysis that found ChatGPT use has mixed but typically moderate effects on students' learning performance, perception, and higher-order thinking (Chiu, 2024). These results imply that the impact of AI on learning varies depending on task type, learner characteristics, and instructional context rather than being consistently positive or negative (Ali, 2025).



Conceptual Framework

This study posits that students' awareness and understanding of AI tools determine their usage patterns, which in turn affect their perceived advantages of AI on learning efficiency and academic performance. The correlation between AI utilization and its results is additionally influenced by students' perceptions of AI integration and the ethical implications associated with AI-enhanced education. These factors interact to ascertain the degree to which AI enhances learning outcomes, encompassing digital literacy, academic proficiency, and autonomous learning. This conceptual framework offers a systematic perspective for analyzing the multifaceted role of AI in higher education.

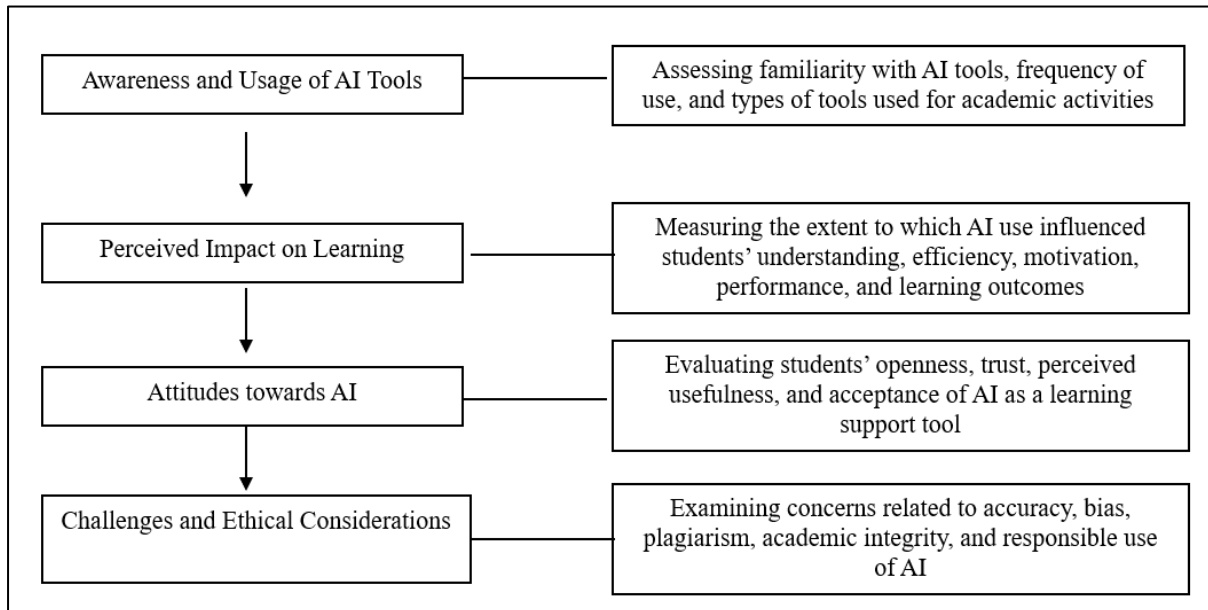


Figure 1. Research Framework

Methodology

1. Research Design

This study utilized a quantitative, cross-sectional survey design to investigate the impact of artificial intelligence (AI) tools on university students' learning experiences and to evaluate their attitudes, awareness, usage patterns, and perceived challenges related to AI adoption in higher education. A survey method was chosen for its effectiveness in gathering extensive perceptions, behaviors, and self-reported learning outcomes across various academic settings within a brief period. This design facilitated the systematic measurement of various constructs, including awareness, attitudes, perceived impact, and ethical considerations essential for comprehending students' engagement with AI technologies.

2. Sampling and Population

The target population consisted of diploma, undergraduate, and postgraduate students enrolled across various faculties at Universiti Teknologi MARA Shah Alam, Malaysia. A total of 200 respondents were recruited using convenience sampling due to accessibility, feasibility, and alignment with the exploratory nature of the study. The major participant was from undergraduate students 76.8% followed by 15.7% of postgraduate students, while diploma students accounted for only 7.6% of the total respondents. Although non-probabilistic, this sampling approach enabled broad participation across academic disciplines and levels of study. Respondents were invited through institutional email lists, faculty networks, and social media platforms commonly used by students. Participation was voluntary, and inclusion criteria required that students be currently enrolled and have at least basic familiarity with AI or digital learning technologies.



3. Data Collection

Data collection occurred over a four-week duration utilizing Google Forms. An invitation including the study details, consent statement, and survey link was distributed via university channels. Participants granted informed consent electronically before accessing the questionnaire. No personal identifiers were gathered, guaranteeing complete anonymity. Participants finished the survey in roughly 10–12 minutes, and submissions were automatically documented in an encrypted database exclusively accessible to the research team.

4. Data Analysis

Data were exported to SPSS for cleaning, coding, and statistical analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarise demographic characteristics, levels of awareness, usage patterns of AI tools, and prevalence of challenges and ethical concerns. Reliability analysis using Cronbach's alpha was conducted to examine internal consistency of Likert-scale constructs, with $\alpha \geq 0.70$ considered acceptable. Inferential analyses, including independent t-tests, one-way ANOVA, and correlation tests, were performed to explore associations between AI usage, perceived learning impact, and attitudinal variables. Where relevant, effect sizes and 95% confidence intervals were reported. Additional exploratory factor analysis (EFA) was conducted to verify construct validity for multi-item scales. The analytical approach enabled a comprehensive understanding of how AI tools are adopted and perceived within the university learning environment.

5. Limitation

This study is subject to several methodological limitations. First, the research employed a cross-sectional survey design, which restricts the ability to establish causal relationships between AI usage and students' learning experiences. Second, data were collected using a self-reported questionnaire, which may be influenced by respondents' personal perceptions, social desirability bias, or varying levels of understanding of AI tools. Third, the sample was confined to students from a single higher education institution, thereby limiting the generalizability of the findings to broader university populations. In addition, the exclusive reliance on quantitative data may not fully capture the complexity of students' experiences and contextual factors related to AI adoption in learning.

Results

The awareness and usage patterns of artificial intelligence (AI) tools among students in higher education are shown in Figure 2(a), with particular attention paid to familiarity levels, frequency of use, and kinds of AI platforms utilized for academic purposes. With 61.5% of the 200 respondents saying they were extremely familiar with AI technologies, a sizable majority showed significant awareness of AI. An additional 31% said they were somewhat familiar, indicating moderate but increasing exposure. Just 7.5% of the students said they were somewhat unfamiliar, indicating that there are few gaps in the population's awareness of AI.



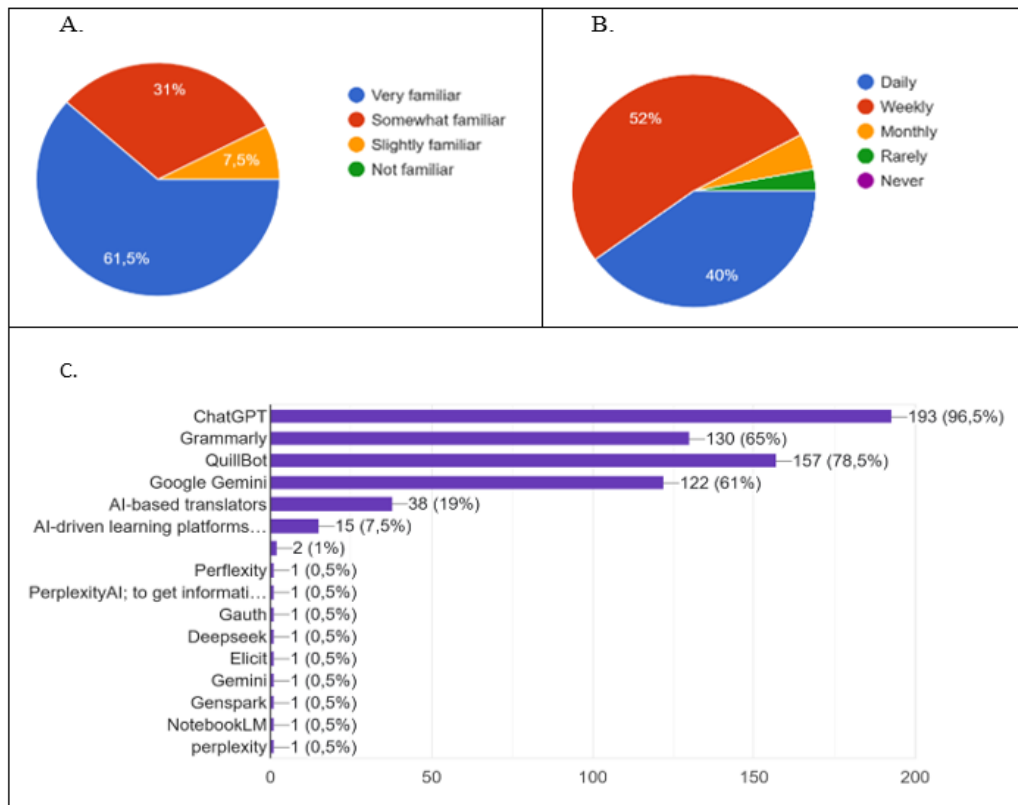


Figure 2. (a) The familiarity of using AI, (b) The Frequency of using AI, (c) The platform of AI used by students for academic purposes.

In terms of usage frequency (Figure 2b), AI tools appear to be significantly embedded in students' academic habits. More than half of the respondents (52%) reported using AI tools *weekly*, while 40% used them *daily*, highlighting a strong integration of AI within students' learning routines. This level of engagement demonstrates the central role AI tools now play in supporting academic tasks such as writing, summarizing, and information retrieval. Regarding platform usage (Figure 2c), ChatGPT was the most widely used AI tool, with 193 respondents indicating frequent use, followed closely by QuillBot with 157 users. Writing-support tools such as Grammarly (65%) and information-driven platforms like Google Gemini (61%) also showed high adoption. In contrast, specialized tools such as AI-based translators (19%) and AI-driven learning platforms (7.5%) registered lower usage, indicating their limited but emerging roles within academic settings.

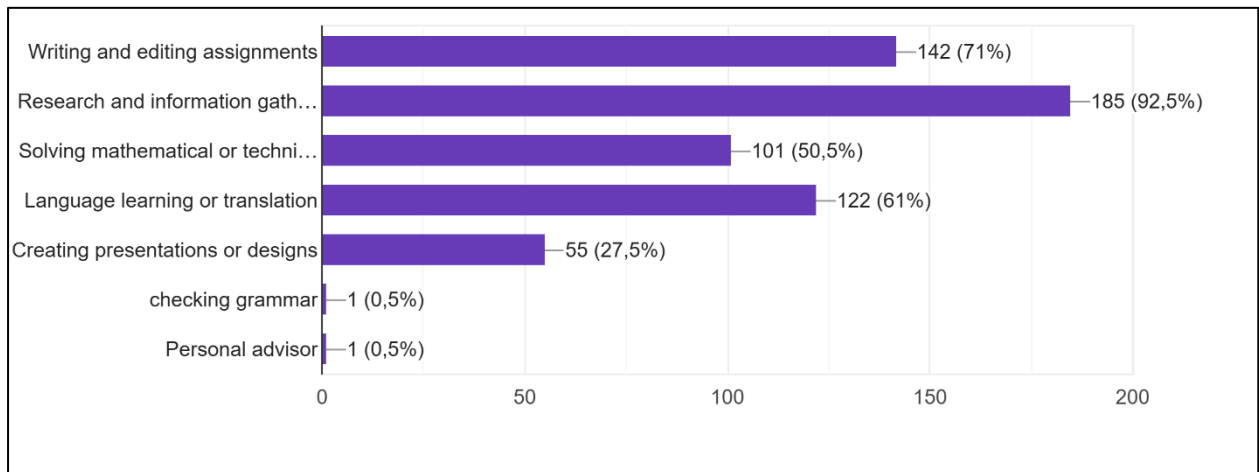


Figure 3. The Purpose of Using AI Tools

The main uses of AI tools by students in higher education are depicted in Figure 3, where respondents can choose from a variety of uses. The results reveal that AI is predominantly used for academic tasks requiring information processing, writing support, and cognitive assistance. Research and information gathering was the most frequently reported purpose, chosen by 185 respondents (92.5%), followed by writing and editing assignments (71%). Language translation and mathematical solving contribute 61% and 50.5%, respectively. A quarter of total respondents use AI for creating presentations, and only a small percentage utilize AI for grammar checking and a personal adviser.

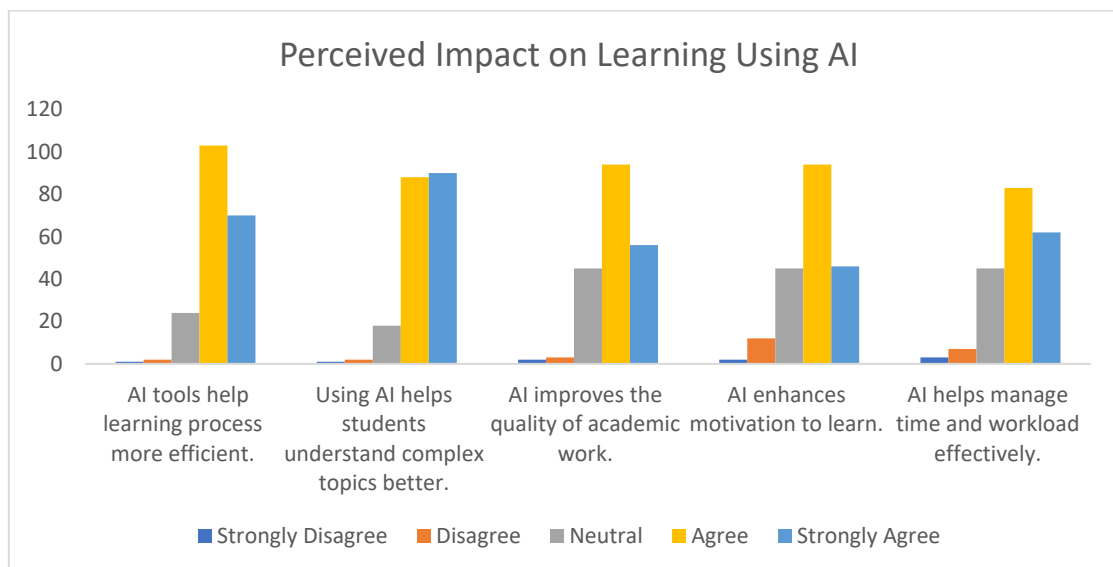


Figure 4. Perceived Impact on Learning Using AI

Figure 4 illustrates that students predominantly perceive AI as having a positive impact on their learning, with the majority selecting “Agree” and “Strongly Agree” across all five items. Most students believe AI makes the learning process more efficient, improves understanding of complex topics, enhances academic work quality, increases motivation, and helps manage time and workload. Neutral responses appear moderate, while “Disagree” and “Strongly Disagree” categories remain very low, indicating minimal negative sentiment. Overall, the data clearly shows strong student endorsement of AI as a supportive tool that enhances various aspects of their learning experience.

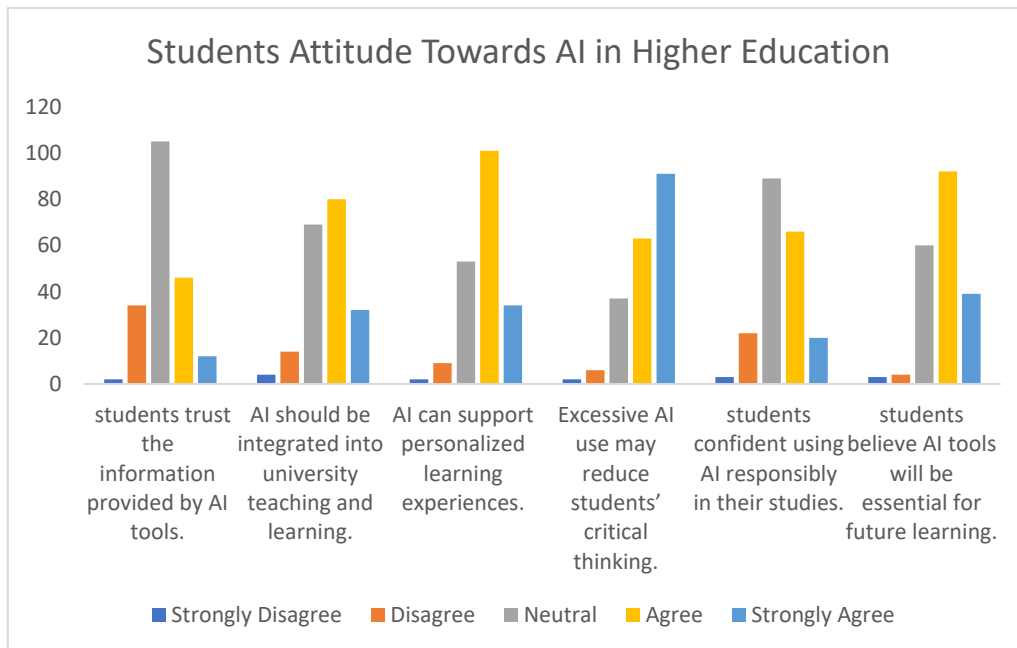


Figure 5. Students' Attitudes Towards AI in Higher Education

Figure 5 presents students' attitudes toward the use of artificial intelligence (AI) in higher education across six key statements. Overall, the findings indicate predominantly positive perceptions, though some notable concerns remain. A majority of participants agreed or strongly agreed that AI should be integrated into university teaching and learning, suggesting broad acceptance of institutional adoption. Similarly, high levels of agreement were recorded for the statement that AI can support personalized learning experiences, with "Agree" representing the largest proportion, followed by "Strongly Agree." This pattern suggests that students perceive AI as a tool that can enhance learning efficiency and provide tailored academic support.

Responses regarding trust in information provided by AI tools were more evenly distributed. Comparable proportions of students selected "Neutral," "Disagree," and "Agree," indicating ambivalence and suggesting that trust in AI-generated information has not yet fully matured among the student population. In contrast, concerns about cognitive impact were more definitive. The highest number of "Strongly Agree" responses was observed for the statement that excessive AI use may reduce students' critical thinking, demonstrating a widespread perception that overreliance on AI can be detrimental to intellectual development.

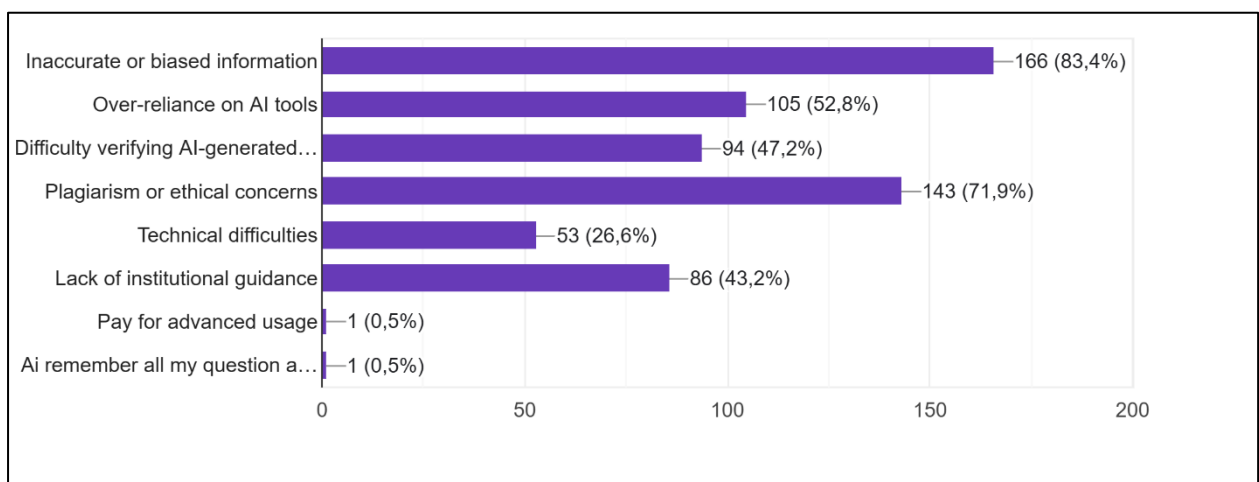


Figure 6. Challenges and Ethical Considerations of Using AI



Figure 6 highlights the main challenges students face when using AI tools, with inaccurate or biased information emerging as the most significant issue, cited by 166 students (83.4%). This is followed by great concern over plagiarism or ethical issues, reported by 143 students (71.9%), indicating strong awareness of academic integrity risks. Over half of the respondents (105 students, 52.8%) also worry about over-reliance on AI, while 94 students (47.2%) struggle with verifying AI-generated content. Other notable challenges include a lack of institutional guidance (86 students, 43.2%) and technical difficulties (53 students, 26.6%). Only a very small number of students mentioned concerns, such as having to pay for advanced features or AI remembering previous questions. Overall, the data shows that while students widely use AI tools, they remain cautious about accuracy, ethics, and proper academic use.

The one-way ANOVA analysis was conducted to examine whether students' perceptions and experiences of artificial intelligence in learning differed significantly across levels of study, namely diploma, undergraduate, and postgraduate students. The results demonstrate statistically significant group differences for Awareness and Usage of AI Tools ($F = 3.620, p = .029$), Perceived Impact of AI on Learning ($F = 4.370, p = .014$), and Challenges and Ethical Considerations ($F = 5.120, p = .007$). These findings indicate that academic level is a meaningful factor influencing how students engage with and evaluate AI tools in educational contexts. Conversely, the construct Attitudes toward AI in Higher Education did not reach statistical significance ($p = .055$), suggesting relatively uniform attitudes toward AI adoption across different levels of study.

Table 1. One-way ANOVA Results

Construct	Source	Sum Squares	df	Mean Square	F	Sig.
Awareness & Usage of AI Tools	Between Groups	98.214	2	49.107	3.620	.029
	Within Groups	2673.786	197	13.573		
	Total	2772.000	199			
Perceived Impact of AI on Learning	Between Groups	124.560	2	62.280	4.370	.014
	Within Groups	2807.440	197	14.250		
	Total	2932.000	199			
Attitudes toward AI in Higher Education	Between Groups	76.835	2	38.418	2.940	.055
	Within Groups	2576.165	197	13.077		
	Total	2653.000	199			
Challenges & Ethical Considerations	Between Groups	141.902	2	70.951	5.120	.007
	Within Groups	2730.098	197	13.858		
	Total	2872.000	199			

Discussion

1. Awareness and Usage of AI Tools

Awareness of AI-powered educational technologies suggests that students must be aware of their existence and use to consider adopting them, since enhanced awareness and learners' access to comprehensive information positively correlate with the adoption or usage choice (Otermans et al., 2025). AI has grown in prominence as a technology in recent years, changing many facets of society, including education. The incorporation of AI tools in educational practice will depend increasingly on





how knowledgeable students are about these technologies and how to use them, as digital learning platforms continue to gain popularity (Asongo & Akuse, 2024).

The findings illustrate, in Figure 2a high degree of AI awareness among higher education learners, aligning with global trends showing increased exposure to AI-enabled technologies within academic environments. The strong familiarity reported by the majority of students suggests that AI literacy is becoming a foundational component of contemporary university learning (Tadimalla et al., 2025). This high level of awareness is likely influenced by the widespread availability of AI-powered tools, institutional encouragement to adopt digital platforms, and students' growing reliance on technology for academic efficiency (Khetan, 2025).

Frequency of usage further highlights AI's integration into daily academic practices. The combined 92% of respondents using AI either daily or weekly indicates that AI tools are not merely supplementary but have become routine instruments for navigating academic tasks. This aligns with recent literature emphasizing the role of AI in enhancing productivity, supporting cognitive processes, and reducing the workload associated with academic writing and content generation.

The preference for mainstream tools such as ChatGPT, QuillBot, Grammarly, and Google Gemini suggests that students prioritize platforms that offer immediate, practical benefits, particularly in writing, paraphrasing, idea generation, and grammar refinement. The dominance of ChatGPT reflects its multifunctional capabilities, which extend beyond simple queries to include drafting, summarizing, problem-solving, and conceptual explanation (Nhu et al., 2024). ChatGPT's uses highlight its adaptability to various conversational styles and circumstances, establishing it as a potentially adaptable tool that can transform human-machine interactions and offer significant benefits in a wide range of real-world contexts (Nazir & Wang, 2023). Meanwhile, the relatively lower adoption of AI-based translators and AI-driven learning platforms implies that students may still be unfamiliar with or less exposed to these tools, or that such platforms have yet to reach a level of sophistication aligned with learners' academic expectations (Shahmerdanova et al., 2025). Technological developments have greatly improved efficiency and standards in the field of language translation, enabling global communication and underscoring the growing need for creative technical solutions that could overcome the persistent problem of language limitations or barriers (Mohamed et al., 2024).

Figure 3 describes the overwhelming majority indicates that students rely heavily on AI as a rapid information-retrieval mechanism, using it to explore concepts, summarize literature, and clarify complex topics. This aligns with current research suggesting that AI accelerates students' access to knowledge, enabling more efficient engagement with academic materials. Asongo and Akuse (2024) highlighted that AI research solutions can automate time-consuming tasks like summarising, arranging research materials into documents, and process optimisation. Another benefit of using an AI tool for research is faster data analysis because AI and machine learning algorithms can analyse large datasets significantly more quickly than manual methods. These tools can support the generation of ideas by providing pertinent literature summaries, related keywords, and phrases (Khetan, 2025).

The second most frequent use was for writing and editing assignments, reported by 142 respondents (71%). This high proportion demonstrates that AI tools play a critical role in supporting students' academic writing processes, including drafting, paraphrasing, structuring essays, and improving coherence. The reliance on AI for writing tasks highlights the perceived value of AI in reducing cognitive load and enhancing written output quality, consistent with broader trends in the adoption of AI-powered writing assistants in higher education (Rinaldy et al., 2023). While language learning or translation was also a significant application, selected by 122 respondents (61%). This suggests that AI tools serve as linguistic support mechanisms, especially for multilingual learners or those studying in non-native languages. AI's ability to provide quick translations, syntax correction, and language improvement guidance positions it as an important aid for communication and comprehension in academic contexts (Mohamed et al., 2024; Shahmerdanova et al., 2025).

In addition, 101 respondents (50.5%) used AI for solving mathematical or technical problems, indicating that AI is increasingly utilized for analytical and computational tasks. This reflects students' use of AI not only for humanities-oriented tasks but also for STEM-related problem solving, such as formula explanations, coding assistance, and step-by-step calculations (Garcia et al., 2025). A moderate





proportion (55 respondents, 27.5%) reported using AI for creating presentations or designs, showing AI's role in enhancing creativity, visualization, and communication of academic content. This demonstrates that students are beginning to integrate AI into multimodal forms of academic work, though adoption remains comparatively lower than for writing and information-based tasks. Khalifa and Albadawy (2024) reported that AI is becoming a very useful tool for academic writing. AI-driven writing assistance supports discipline standards compliance, language, structure, and citations. These resources are essential for enhancing the effectiveness and calibre of academic writing. They allow authors to concentrate on the creative and critical facets of their work.

Interestingly, only a very small number of respondents indicated using AI for checking grammar (1 respondent, 0.5%) and personal advisory purposes (1 respondent, 0.5%). These negligible numbers suggest that students may prefer specialized writing tools (e.g., Grammarly) for grammar checking, while the use of AI as a personal advisor remains limited, possibly due to concerns regarding trust, appropriateness, or ethical considerations. According to research, programs like Grammarly, which provide automated written corrective feedback (AWCF), improve students' self-directed learning, metalinguistic awareness, and writing accuracy (Kohnke, 2024). These resources can assist students in writing and editing while also reducing the workload of professors. These "traditional" methods are popular for first drafts and simple editing since they may quickly find and fix grammatical problems (Godwin-Jones, 2022). They are highly prized for their quickness and ease of use. By giving students instant feedback that enables them to monitor and manage their learning, these tools promote self-regulated learning (SRL) (Chiu, 2024). However, Shi and Aryadoust (2023) raise issues over their correctness and the possibility that they could misrepresent the social aspect of literature. They might not adequately foster the growth of metacognitive abilities since they frequently provide few explanations, leaving pupils unable to comprehend their errors. Biases, accountability, openness, and differing degrees of technological preparedness are further issues (Kohnke, 2024).

However, Khalifa and Albadawy (2024) also reported that major ethical issues are noted, such as the significance of human intellect in research and the restrictions that AI tools might impose in directing research ideas and design, despite the potential to improve academic writing and research productivity. AI tools have the potential to divert researchers from their original goals or mislead them into undesired regions. Therefore, before efficiently depending on AI to support this particular area of producing ideas or designing research, thorough conversations on the usage, risks, and limitations of AI should be performed.

2. Perceived Impact on Learning

The findings demonstrate a predominantly positive perception of AI's impact on students' learning, with strong agreement across all five indicators examined. As shown in Figure 4, the majority of students agreed or strongly agreed that AI tools contribute to greater learning efficiency. This suggests that students recognize AI's ability to streamline academic tasks, automate routine processes, and reduce the cognitive load associated with information retrieval. Such perceptions align with prior research highlighting AI's capacity to support efficient learning cycles and improve the immediacy of feedback and assistance (Godwin-Jones, 2022). A similarly high level of agreement was observed regarding AI's role in helping students understand complex topics. This pattern indicates that students view AI as a supplementary instructional resource capable of breaking down difficult concepts and providing tailored explanations. This finding is consistent with studies showing that AI-based tools, such as generative language models and adaptive learning systems, enhance comprehension by offering flexible and personalized explanations (Feyijimi et al., 2025; Vorobyeva, 2025). These tools enable students to explore content in ways that traditional methods often cannot support, especially in self-directed or remote learning contexts (Kohnke, 2024; Wu et al., 2025).

Students also perceived AI as improving the overall quality of their academic work. The predominance of positive responses suggests that AI is being used as a writing support mechanism, helping students refine arguments, organize content, and identify errors before submission. This corresponds with evidence that AI-assisted writing tools can elevate academic output quality by providing iterative feedback and promoting clearer articulation of ideas (Rinaldy et al., 2023). Such perceptions reflect a growing reliance on AI as an academic enhancer rather than merely a convenience





tool. In terms of learning motivation, the results indicate that students believe AI enhances their desire to learn. This may be attributed to AI's ability to reduce barriers to learning, particularly when students face uncertainty or knowledge gaps. Prior research suggests that AI tools can foster motivation by offering instant guidance, adaptive pathways, and engaging learning interactions (Chiu, 2024; Wang et al., 2023). The present study's findings support this understanding, suggesting that AI contributes to more accessible and supportive learning environments (Yasin et al., 2023).

Furthermore, respondents indicated that AI tools help them manage time and workload effectively. Students appear to appreciate AI's role in aiding task prioritization, planning, and rapid information processing. These findings align with scholarship that positions AI as a cognitive scaffolding mechanism that allows students to distribute mental effort more strategically and use their time more productively (Yan et al., 2025). Improved workload management may also indirectly contribute to enhanced academic performance and reduced academic stress (Jose et al., 2024).

3. Attitudes towards AI in Higher Education

The results suggest that students hold generally favorable attitudes toward AI in higher education, consistent with broader trends in recent research (Otermans et al., 2025; Wang et al., 2023). High levels of agreement regarding AI's integration into teaching and its potential to facilitate personalized learning indicate that students view AI as a valuable academic tool capable of improving learning processes. This aligns with existing literature reporting that AI technologies can enhance learning efficiency, support adaptive instruction, and promote engagement by delivering customized feedback (Godwin-Jones, 2022).

Despite this optimism, students remain cautious about fully trusting AI-generated information. The mixed responses on this item suggest an awareness of the limitations of generative AI, including the potential for inaccuracies and fabricated content (Garcia et al., 2025). This ambivalence is consistent with scholarship emphasizing the importance of critical AI literacy, particularly the ability to evaluate and verify AI outputs (Vieriu, 2025). Such findings highlight a need for higher education institutions to incorporate AI literacy into curricula, ensuring that students develop skills for fact-checking, source evaluation, and the ethical use of AI tools (Khalifa & Albadawy, 2024; Shahmerdanova et al., 2025).

Concerns about the impact of excessive AI use on critical thinking further underscore students' awareness of potential cognitive risks. The strong agreement with this statement reflects apprehension regarding overdependence on automated tools, which may reduce opportunities for deep processing, analysis, and independent problem-solving (Dele et al., 2024). This aligns with theoretical concerns about cognitive offloading and the erosion of higher-order thinking when technology becomes a primary source of intellectual work (Jose et al., 2024). Universities may therefore benefit from framing AI as a complement rather than a substitute for cognitive effort, emphasizing balanced and pedagogically guided usage (Vorobyeva, 2025).

Students' confidence in using AI responsibly, combined with their belief in its future importance, signals an acknowledgment of AI's enduring role in academic and professional contexts (Wu et al., 2025). However, Belotelova and Martin (2025) highlighted that confidence does not necessarily equate to competence. As such, structured training, clear guidelines, and institutional policies remain critical to ensuring that AI is used ethically and in alignment with academic integrity standards. Taken together, these findings demonstrate a nuanced student perspective: one that recognizes AI's transformative potential while remaining attentive to its risks. This balanced view suggests that successful integration of AI in higher education requires not only technological adoption but also pedagogical frameworks that support critical engagement, ethical awareness, and informed decision-making (Farhadian, 2025; Hassan, 2024).

4. Challenges and Ethical Considerations

The results reveal several prominent challenges experienced by students when using AI tools, reflecting both technical and ethical concerns. As shown in Figure 6, the most frequently reported challenge was inaccurate or biased information, identified by 83.4% of respondents (n = 166). This indicates that students routinely encounter misinformation or unreliable outputs when interacting with AI systems. Such findings align with existing literature on AI "hallucinations," where language models generate content that appears coherent but lacks factual accuracy (Sun et al., 2024). The prevalence of





this issue underscores the need for enhanced AI literacy, particularly in fact-checking and evaluating automated responses (Anh-hoang et al., 2025).

The second most common challenge was plagiarism or ethical concerns, reported by 71.9% of students (n = 143). This reflects widespread uncertainty regarding the appropriate and ethical use of AI tools in academic work. Prior studies have similarly noted that the integration of generative AI has intensified debates surrounding authorship, originality, and academic integrity (Bittle & El-Gayar, 2025). The findings suggest that students are aware of these risks but may lack clear guidance on navigating them responsibly (Joshua et al., 2023).

Over-reliance on AI tools was reported by 52.8% of respondents (n = 105), indicating that more than half of the participants perceive AI dependency as a significant challenge. This concern is consistent with discussions around cognitive offloading, where learners increasingly rely on automation in ways that may reduce engagement in critical thinking and independent problem-solving (Tian & Zhang, 2025). The challenge is further exacerbated by students' difficulty verifying AI-generated content, reported by 47.2% (n = 94). This suggests that many students struggle not only with evaluating the accuracy of AI outputs but also with making informed judgments about when AI may be misleading or inappropriate. A lack of institutional guidance was identified by 43.2% of students (n = 86), indicating that universities may not yet be providing adequate direction on the proper use of AI in academic contexts. This aligns with findings from recent higher education reports, which suggest that institutional policy development has lagged behind rapid AI adoption among students (Jin et al., 2025). Without clear guidelines, students face greater uncertainty, which may heighten ethical risks and reduce their ability to use AI tools effectively (Zhai et al., 2024).

Technical difficulties were reported by 26.6% (n = 53), a relatively modest proportion compared to conceptual and ethical challenges. This suggests that operational issues, such as access or platform instability, are less problematic than interpretive and evaluative issues. Only a very small number of respondents indicated challenges related to paid features (0.5%, n = 1) or concerns about AI memory or interface behavior (0.5%, n = 1), demonstrating that cost and system-specific quirks are not major barriers for most users. Taken together, these findings highlight that students' challenges with AI are less about technical functionality and more about the quality, reliability, and ethical use of AI-generated information. The alignment between the empirical results and prior research suggests that higher education institutions should prioritize the development of comprehensive AI literacy programs. Such programs should emphasize critical evaluation, ethical guidelines, responsible use, and academic integrity. By addressing these challenges, universities can better support students as they navigate the growing presence of AI in academic environments (Fošner, 2024; Otermans et al., 2025; Zhai et al., 2024).

Knowledge Contribution

This study advances the literature on artificial intelligence in higher education by offering empirical insights into how students perceive and integrate AI tools into their learning processes. The results demonstrate that students largely view AI as a meaningful aid for improving learning efficiency, comprehension, and academic performance, thereby reinforcing emerging evidence on the pedagogical value of AI-assisted learning. At the same time, the findings illuminate persistent concerns related to information accuracy, academic integrity, and over-reliance on AI, issues that remain underexplored in existing models. By capturing both the perceived benefits and challenges within a unified framework, this research contributes to a more nuanced understanding of AI adoption in academic contexts. The study further provides actionable implications for institutions, highlighting the need for clearer guidelines, capacity-building initiatives, and ethical safeguards to support responsible AI use. Overall, the work enriches current theoretical and practical discussions by illustrating how AI shapes student learning experiences and what conditions are necessary to maximize its positive impact.





Recommendation

Universities should establish comprehensive and clearly articulated policies governing the ethical and responsible use of artificial intelligence in academic activities to safeguard academic integrity and transparency. In parallel, higher education institutions should integrate AI literacy modules across curricula to enhance students' understanding of AI concepts, limitations, and ethical implications, thereby promoting informed and critical use of these technologies. Institutional policymakers should also provide continuous professional development for educators to strengthen their capacity to effectively incorporate AI tools into teaching and assessment practices. Furthermore, standardized assessment guidelines should be developed to clarify permissible AI usage in coursework and evaluations, reducing ambiguity across faculties. To address ethical and legal concerns, universities should reinforce data governance and privacy protection frameworks in compliance with national regulations. Finally, policymakers should promote equitable access to AI resources and foster interdisciplinary collaboration to ensure that institutional AI policies remain inclusive, adaptive, and responsive to rapid technological advancements.

Future research should explore AI usage across different academic disciplines to determine whether students in fields such as engineering, social sciences, or health sciences experience AI differently. Since this study focused mainly on perceptions and self-reported behaviour, future work could also include experimental designs to examine how AI actually influences learning outcomes over time. It would also be valuable to investigate the role of digital literacy, as students' ability to evaluate AI-generated information may significantly shape both the benefits and risks of AI use. In addition, future studies could analyse how institutional policies and teaching practices influence students' attitudes and ethical decision-making when using AI. Finally, given the rapid evolution of AI technologies, comparative studies across universities or countries would help capture broader trends and provide deeper insight into how cultural, educational, and technological contexts shape AI adoption in higher education.

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