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Exploring the Impact of Artificial Intelligence Integration in Higher Education: Perspectives from Physics and Industrial Physics Undergraduates at Universiti Teknologi MARA

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ABSTRACT

Despite the rapid integration of numerous artificial intelligence-driven tools (chatbots, automated feedback systems, and intelligent tutoring platforms), a comprehensive understanding of students' perspectives is necessary to ensure their effective and ethical deployment. Therefore, this study examined the impact of artificial intelligence (AI) integration on undergraduate educational experiences in higher education. The assessment included undergraduates from the Bachelor of Science (Honours) Industrial Physics and Bachelor of Science (Honours) Physics programmes at the Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam. Data collection was then conducted via a Google Forms survey with 30 participants. This process yielded information concerning the participants' experiences, perceptions, and concerns regarding AI in their academic pursuits. Despite the participants' perceiving AI as a valuable support tool that could enhance learning engagement, flexibility, and feedback quality, concerns were expressed concerning academic integrity, reduced human interaction, and overreliance on technology. Consequently, this study could offer crucial information regarding the pedagogical effectiveness and learner-centred nature of AI integration in higher education based on students' viewpoints, enabling them to influence the future of AI in education.

1. INTRODUCTION

The increasing incorporation of artificial intelligence (AI) in education has significantly transformed conventional learning environments in recent years. Notably, AI-related technologies have enabled personalised and technology-adaptable learning experiences across various disciplines. These technologies include automated assessment tools, intelligent tutoring systems, and generative models (ChatGPT). A previous study reported that these technologies can improve learning outcomes through immediate feedback, personalised pacing, and continuous support (Al-Mansouri, 2024). These attributes are particularly appealing in higher education, where students frequently manage numerous academic and

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personal responsibilities. Current AI solutions also effectively provide convenience, diminish cognitive burden, enhance active learning, and elevate student motivation (Zhan et al., 2022). Nonetheless, the integration of AI in educational settings poses specific challenges, which continue to stimulate discussion among educators and researchers (Fowler, 2023). Notable examples of these concerns include academic integrity, data privacy, reduced interaction between students and lecturers, and excessive reliance on automated solutions. Although current literature has elucidated the technical effectiveness of AI, the perspectives of learners concerning non-information technology (applied sciences) have been inadequately addressed. Moreover, the integration of AI in Malaysian higher education is inconsistent, exhibiting significant disparities in adoption across institutions and academic programmes.

A recent study has documented varying elements regarding AI deployment in Malaysian universities (Ismail, 2025). These elements include infrastructure readiness, digital literacy levels, and institutional strategies. Students at the Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM), are also beginning to utilise AI-related technologies for research assistance, report writing, and data analysis in preparation for careers in science and technology. Thus, the experiences and perspectives of these students may provide valuable information on the status and future potential of AI integration within the Industrial Physics programme at UiTM. Nevertheless, further research is still pivotal to capture viewpoints across Malaysian higher education. This study then investigated the undergraduate students' perceptions of AI in relation to their academic experiences. The assessment aimed to improve the creation of inclusive and successful AI-based teaching strategies by concentrating on these students' perspectives. Consequently, alignment with learners' expectations and established pedagogical best practices could be ensured through this process.

1.1 Problem Statement and Significance of the Study

The integration of AI into higher education has increased in the digital era, offering tools that can enhance learning across various disciplines (Kuleto et al., 2021). These AI technologies are increasingly recognised for their capacity to improve learning efficiency and accessibility. Examples of these technologies are chatbots, grammar checkers, and automated feedback systems (AbuSahyon et al., 2019). In contrast, the effectiveness of these tools is contingent upon students' perceptions and interactions, which are influenced by various factors. These factors include academic background, prior exposure, and digital literacy (Zawacki-Richter et al., 2023). Even though institutions may adopt AI to improve productivity while promoting educational innovation, students' experiences vary and are occasionally influenced by inconsistent support or guidance. One prominent example is students outside of computer science (science-related programmes) often engaging with AI tools without formal training. This process can lead to a spectrum of responses that include enthusiasm, confusion, and scepticism (Aoun, 2017).

Concerns have emerged regarding the overreliance on AI-generated outputs, the potential erosion of critical thinking skills, the risks of academic dishonesty, and the diminished human interaction in educational settings (Nwozor, 2025). Despite extensive theoretical discourse on these issues, there is a notable deficiency in empirical studies capturing students' lived experiences and attitudes toward AI in practical contexts. The gap then underscores the importance of research that prioritises student perspectives. Hence, this study could bridge the gap between technological innovation and student-centred pedagogical practices. The assessment involved examining the perspectives of undergraduate students in the Faculty of Applied Sciences at UiTM to identify the primary benefits and challenges of AI utilisation in academic environments. Consequently, understanding these perspectives could ensure that AI could complement (rather than replace) human-centric learning, sustaining educational values while embracing technological advancement (Williamson & Eynon, 2020).

1.2 Research Objectives

The questions in this study assessed students' familiarity with numerous AI applications. These applications included writing aids, virtual tutors, and plagiarism detection systems in identifying

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perceived benefits and challenges, such as reliability, ethics, and academic integrity-related issues. The inquiries also examined the impact of AI on student motivation and engagement, the equilibrium between AI tools and traditional human instruction, and students' suggestions for enhancing institutional support, digital literacy, and the ethical application of AI in education.

1.3 Research Questions

This study presented several research questions, including the following.

i) What categories of AI technologies have students experienced in their educational environments, and with what frequency are these tools utilised?

ii) What are students' perspectives on the benefits and challenges of employing AI tools in academic learning?

iii) What is the impact of AI integration on student motivation, engagement, and autonomy in the learning process?

iv) What role do students perceive AI to play in the educational process concerning human interaction and professor engagement?

v) What strategies can educators and institutions implement to enhance their assistance to students in the responsible and effective use of AI throughout their academic pursuits?

2. LITERATURE REVIEW

The integration of AI in higher education has garnered significant attention in recent years as institutions explore novel methods to improve teaching and learning experiences (Zawacki-Richter et al., 2019). These AI technologies are being utilised more frequently in various educational domains. Examples of these areas include personalised learning, automated grading, and administrative operations (Igbokwe, 2023). Therefore, the literature analysis in this study synthesised current research on the role and impact of AI in higher education, involving its benefits, challenges, ethical implications, and potential to transform instructional practices. This study also evaluated undergraduate students' perspectives, which were essential for understanding the perceived effectiveness and barriers associated with AI integration in academic environments (Lin & Chen, 2024).

2.1 Theoretical Framework: The Role of Technology in Education

Multiple educational theories have been applied to analyse AI in higher education. Specifically, the technological pedagogical content knowledge (TPACK) framework is relevant for integrating AI tools within educational contexts. This framework highlights the intersection of technology, pedagogy, and subject knowledge, indicating that successful integration of AI in education necessitates educators and learners to possess adequate knowledge and abilities in effectively incorporating AI technologies into the curriculum (Kim, 2024). Another employed model is the substitution, augmentation, modification, and redefinition (SAMR) model, which provides a framework for examining the potential enhancements or transformations that AI can bring to educational practices. These AI solutions can then replace conventional approaches (automated grading), enhance current practices (providing real-time feedback), or transform educational experiences (enabling large-scale personalised learning) (Bhatia et al., 2024). This progression aligns with the SAMR model of technology integration, which categorizes the use of technology in education into four levels: Substitution, Augmentation, Modification, and Redefinition. At the substitution and augmentation levels, AI serves as a tool to improve existing practices, while at the modification and redefinition levels, it facilitates entirely new learning experiences that were previously

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unattainable. The role of AI can also be analysed through the lens of constructivism, which posits that learners actively construct their knowledge through engagement with their environment. Thus, AI tools offering personalised learning experiences are consistent with this theory, allowing students to advance at their own pace and tailor their learning experiences to fulfil their requirements (Rane et al., 2023). Similarly, the capacity of AI to provide immediate feedback and facilitate adaptive learning pathways aligns with behaviourism principles, which focus on behavioural changes through reinforcement (Ejjami, 2024).

2.2 AI in Education: Benefits and Effectiveness

Various AI tools are recognised for their ability to enhance educational experience via personalised learning paths, real-time feedback, and automation of administrative tasks, in which the capacity for personalised learning is a notable advantage of AI in higher education. Particularly, adaptive learning platforms powered by AI can analyse students' learning patterns and tailor content to their needs (Yekollu et al., 2024). One significant example of this platform is smart tutoring systems. According to a recent study, AI-based systems can substantially improve student performance through personalised learning experiences (Lin et al., 2023). This process can enable students to advance at their own pace. Likewise, most AI tools can enhance students' engagement, motivation, and personalisation. One considerable example involves AI-based gamification systems that integrate game-like elements into the learning process. These systems have been demonstrated to increase student interest and participation (Suresh & Dhakshina, 2024). Similarly, AI-powered virtual assistants (chatbots) provide students immediate access to information, enhancing engagement while reducing the time required to find answers to fundamental questions (Shad & Potter, 2024). The AI technology also significantly enhances assessment processes, in which higher education institutions are progressively adopting automated grading, AI-driven plagiarism detection, and AI-based feedback systems to facilitate consistent, timely, and unbiased evaluations (Geetha, 2025). Certain studies have indicated that students value the efficiency of AI-powered assessments, as they provide quicker feedback while assisting in pinpointing areas for improvement.

2.3 Challenges to AI Integration

Despite the numerous benefits of integrating AI into higher education, the process still presents several challenges. Notably, technical issues associated with the implementation of AI systems represent a significant barrier. These challenges encompass system integration issues, the necessity for modernised infrastructure, and insufficient training for students and faculty (Kumar et al., 2021). Many institutions within developing regions with restricted technological access also encounter financial constraints in adopting AI tools. Moreover, privacy and security concerns represent substantial obstacles to the widespread adoption of AI in higher education. Most AI tools also frequently necessitate access to extensive personal data, prompting concerns regarding data protection and the management of student information. Studies have depicted that students often express concerns about the AI systems that collect personal data, citing apprehensions concerning data breaches and the misuse of their information (Ismail, 2025). Furthermore, the potential of AI systems to be targeted by cyberattacks or to misuse data presents a significant concern that needs to be addressed by institutions and policymakers. Access and equity also continue to pose notable challenges, as students do not uniformly possess access to the technology necessary for AI integration. Specifically, students from lower socioeconomic backgrounds often lack access to essential devices and stable internet connections, which hinders their ability to engage with AI-driven educational tools fully. Therefore, the digital divide intensifies pre-existing inequalities in higher education and requires interventions to guarantee equitable access to AI resources (Li, 2023).

2.4 Ethical Concerns in AI Integration

The ethical implications of AI in education remain a subject of active discussion. Considering that AI systems frequently depend on student data for optimal functionality, data privacy is a significant concern. Critics have also argued that students may lack a comprehensive understanding of the processes involved

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in the collection, storage, and sharing of their data with third parties. Additionally, the bias present in algorithms represents a critical issue, in which AI systems depend on the quality of their training data. If the training data contains biases, the algorithms can perpetuate these biases in assessments or learning recommendations (Baker & Hawn, 2022). Another ethical issue pertains to the transparency of AI systems. Therefore, students and educators should comprehend the decision-making processes of AI tools on high-stakes assessments. Insufficient transparency can then result in distrust in AI systems, compromising their effectiveness and user acceptance (Wanner et al., 2022). The inability of students and educators to understand the decision-making processes of AI in grading, personalised feedback, or learning recommendations is also a notable concern about fairness and accountability. This opaqueness (often referred to as the "black box" problem) denotes systems whose internal workings remain obscured and are not interpretable by users. Consequently, identifying and rectifying errors or biases within the system becomes challenging. Certain researchers have argued that the absence of explainability and interpretability may diminish users' meaningful engagement with AI tools, potentially obstructing their successful integration in educational settings.

2.4 The Future of AI in Higher Education

The role of AI in higher education is expected to expand significantly in the future. A substantial body of literature indicates that AI can revolutionise multiple facets of education, including personalised learning, intelligent tutoring systems, and administrative automation (Lin, 2023). Hence, the future integration of AI is anticipated to create more dynamic and responsive learning environments, enabling students to receive personalised guidance and support in real-time. Students and educators are also optimistic about the potential of AI to enhance educational experience. Robinson et al. (2023) published that students perceived AI as a pivotal factor in the future of education for improving learning experiences and assessment processes. Conversely, the study revealed that the successful integration of AI necessitated that institutions should address accessibility, equity, and data privacy-related challenges to foster trust while ensuring that all students could benefit from its advantages. This outcome suggests that integrating AI in higher education can significantly enhance teaching and learning experiences through personalised learning, improved assessments, and increased engagement. Nevertheless, successfully adopting AI tools requires addressing several challenges. These issues include technical limitations, privacy concerns, and issues of access and equity. Ethical considerations (data privacy and algorithmic bias) should also be carefully considered to ensure the responsible and transparent use of AI tools. Given that AI continues to evolve, it significantly impacts higher education. This process can transform the way students learn, how they are assessed, and the overall educational experience.

3. METHODS

3.1 Respondents

Approximately 90% of participants were aged 18 to 20, with smaller proportions in the 21–23 (6.7%) and 24–26 (3.3%) age groups. This demographic profile indicated that the survey primarily represented the perspectives of younger undergraduate students, which was characteristic of the standard age range in higher education. Furthermore, approximately 70% and 30% of participants were male and female, respectively. Thus, this outcome suggested a slight male predominance in the survey sample. Although this data might not encompass all students in higher education, it still provided useful information concerning the male perspective on AI integration. Most respondents (73.3%) were also in their first year of study, with 20% in their second year (20%) and 6.7% in their third year (6.7%). This distribution signified that the survey effectively targeted early-stage undergraduate students, who likely possessed less experience with AI integration compared to their senior counterparts. Meanwhile, the survey sample consisted of two groups: (i) 60% enrolled in the BSc (Hons.) Physics (AS203) and (ii) 40% enrolled in the BSc (Hons.) Industrial Physics (AS251) programmes. This distribution implied a balanced perspective among students in traditional physics and industrial applications, which could interact differently with AI tools.

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3.2 Research Design

This study employed a mixed-methods survey designed to investigate undergraduate students' perspectives on the integration of AI in higher education. The analysis combined quantitative data from closed-ended questions with qualitative insights from open-ended responses, facilitating a comprehensive understanding of student experiences. A questionnaire was also developed independently using Google Forms. The instrument comprised 25 questions, which included 21 closed-ended items and four open-ended prompts. These questions were organised into six sections: (i) demographics, (ii) AI familiarity and usage, (iii) perceived learning benefits, (iv) AI-assisted assessment, (v) challenges and ethical concerns, and (vi) overall attitudes toward AI in education. Likewise, the questionnaire was reviewed for content validity by a colleague possessing academic expertise in educational technology and physics education. In response to the feedback, several items were revised for enhanced clarity and relevance. The exploratory and small-scale nature of the study also precluded formal reliability testing, which was acknowledged as a study limitation.

A total of 30 undergraduate students from the Bachelor of Science (Honours) Physics (AS203) and Industrial Physics (AS251) programmes at the Faculty of Applied Sciences, UiTM, participated in this study. Participants were recruited through a convenience sampling strategy, which was determined by their availability and willingness to participate. Participation was also voluntary, with no incentives provided, and no personal or sensitive information collected. Considering that this study engaged the researcher's students in a classroom-based setting and posed minimal risk, formal ethical approval was not obtained. This decision was consistent with institutional guidelines for low-risk, internal teaching-related studies. Data were then collected over four weeks between March and July 2024, utilising a Google Form link disseminated through email and learning platforms. Subsequently, quantitative data were analysed using Microsoft Excel to compute descriptive statistics (frequencies, percentages, and mean scores). These responses to closed-ended items employed a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree, or 1 = Not at All Concerned to 5 = Extremely Concerned, depending on the item). Thematic analysis was also conducted on qualitative data from open-ended responses to identify recurring themes, feedback, and concerns expressed by the students.

4. FINDING & DISCUSSION

4.1 Categories of AI Technologies Experienced and Frequency of Use

Table 1 illustrates that most respondents (90%) classified themselves as familiar or very familiar with AI (ratings 4 and 5 on a five-point scale). This significant degree of self-reported familiarity indicated that students from computer science-based programmes were increasingly incorporating AI tools into their academic routines. The exposure could arise from AI-integrated platforms utilised in coursework or from self-initiated exploration. Nonetheless, Aoun (2017) explained that exposure without structured instruction could result in a superficial understanding. This finding reinforced the importance of integrating foundational AI literacy into science-based curricula to enable students to employ AI tools more effectively and responsibly. The trend also aligned with broader findings in higher education, indicating an increase in AI awareness among students across various disciplines.

Table 1. Students' Self-Rated Familiarity with AI (n = 30)

Rating (Five-Point Scale)	Description	Number of Participants	Percentage (%)
5	Very familiar	13	43.3
4	Familiar	14	46.7
3	Neutral	3	10.0
2	Slightly familiar	0	0
1	Not familiar at all	0	0

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All participants (100%) suggested the utilisation of AI-based tools in their educational activities, demonstrating that AI was integrated into students' academic experience. Table 2 reveals that the predominant AI applications comprise virtual assistants (chatbots), adaptive learning platforms, and AI-based research tools. This finding underscored the growing significance of AI in enhancing learning through automation, personalised recommendations, and improved efficiency in academic task completion. The results were consistent with previous studies, which reported that students were adopting AI tools to increase productivity, optimise assignments, and obtain prompt feedback (Bhatia et al., 2024; Lin & Chen, 2024). The prevalent adoption also indicated a shift in students' expectations regarding technologically enhanced learning environments. Contrastingly, Zawacki-Richter et al. (2019) denoted that the educational effectiveness of these tools was contingent upon their integration into pedagogical strategies. Therefore, this observation reinforced the need for educators to instruct students in the purposeful and responsible use of AI tools.

Table 2. Most Frequently Used AI Applications in Education (n = 30)

AI Application	Frequency	Percentage (%)
AI-based research tools	23	76.7
Virtual assistants (chatbots)	21	70.0
Adaptive learning platforms	10	33.3
Intelligent tutoring systems	9	30.0
Automated grading systems	4	13.3
Other	1	3.3

4.2 Perspectives on the Benefits and Challenges of AI in Learning

A significant majority of students perceived AI tools as effective in enhancing their learning experience. Table 3 demonstrates that 56.7% of students rate AI tools as very effective (rating = 5), whereas 40% consider them effective (rating = 4). Only one student provided a neutral response, and no students indicated negative perceptions. These findings suggested that students frequently utilised AI tools and perceived them as beneficial for improving engagement, motivation, and learning outcomes. Previous studies also reported similar findings, in which AI integration in higher education enhanced personalised learning, timely feedback, and academic confidence (Lin & Chen, 2024; Ejjami, 2024). Overall, the favourable response underscored the necessity for continued development of AI-enhanced learning environments when informed by effective pedagogical practices.

Table 3. Effectiveness of AI-Based Tools in Enhancing the Learning Experience (n = 30)

Rating (Five-Point Scale)	Number of Participants	Percentage (%)
5 (Strongly Agree)	17	56.7
4 (Agree)	12	40.0
3 (Neutral)	1	3.3
2 (Disagree)	0	0
1 (Strongly Disagree)	0	0

4.3 Impact of AI Integration on Motivation, Engagement, and Autonomy

All students (100%) reported that AI-based assessment tools positively influenced their academic performance. Table 4 reveals that 96.6% of participants rate this improvement highly (rating = 4 or 5), demonstrating significant confidence in the role of AI in enhancing learning outcomes. These participants widely adopted various tools (automated grading systems and plagiarism detection software), recognising their effectiveness in delivering faster, more objective, and consistent feedback. Additionally, previous studies supported this observation, documenting that AI could improve assessment accuracy and efficiency (Geetha, 2025; Bhatia et al., 2024). Students also recognised the transparency and reliability offered by these tools, which were essential for minimising grading bias while promoting fairness.

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Overall, the positive response underscored the potential of AI tools to enhance assessment processes and academic confidence.

Table 4. Students' Perceptions of AI-Based Assessment Tools for Improvement (n = 30)

Rating (Five-Point Scale)	Number of Participants	Percentage (%)
5 (Strongly Agree)	16	53.3
4 (Agree)	13	43.3
3 (Neutral)	1	3.3
2 (Disagree)	0	0
1 (Strongly Disagree)	0	0

4.4 AI's Role in Human Interaction and Professor Engagement

Although students typically perceived AI tools favourably, significant ethical concerns persisted. Table 5 presents that 43.3% of participants express moderate concern (rating = 3). On the contrary, 53.3% indicated high concern (rating = 4 and 5). This outcome implied that over half of the participants expressed significant concerns regarding data privacy, bias in AI algorithms, and insufficient transparency in decision-making processes. The issues also aligned with findings in the literature addressing the ethical risks of AI in education concerning "black box" systems that obscured the decision-making processes of AI (Baker & Hawn, 2022; Wanner et al., 2022). Even though a minority of students (6.6%) indicated low or no concern, the data highlighted a significant necessity for educational institutions to address these challenges. Overall, enhancing transparency, ensuring fairness, and fostering students' trust in AI systems were essential measures for the ethical and sustainable integration of AI.

Table 5. Students' Concerns Regarding Ethical Implications of AI in Education (n = 30)

Rating (Five-Point Scale)	Level of Concern	Number of Participants	Percentage (%)
5	Very concerned	6	20.0
4	Concerned	10	33.3
3	Moderate concern	13	43.3
2	Slight concern	1	3.3
1	Not concerned	1	3.3

4.5 Strategies for Supporting Responsible and Effective AI Use

Table 6 indicates that most students (90%) perceive AI-based assessment tools as reliable or very reliable. This observation reflected a high degree of assurance in employing AI for grading and evaluation, concerning delivering faster feedback and consistent scoring. Only 10% of participants rated AI tools as moderately reliable, with no individuals indicating lower levels of trust. These findings suggested that students generally exhibited comfort with the integration of AI in academic assessments. The presence of moderate concern also underscored the importance of transparency in the operation of AI systems. Previous studies then propounded the value of combining AI tools with human oversight to ensure fairness while mitigating potential limitations in context sensitivity (Fowler, 2023; Zawacki-Richter et al., 2019). Even though student perceptions were predominantly favourable, clear communication regarding the functioning of AI in assessments could further improve trust and acceptance.

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Table 6. Students' Perceptions of the Reliability of AI-Based Assessment Tools (n = 30)

Rating (Five-Point Scale)	Perceived Reliability	Number of Participants	Percentage (%)
5	Very reliable	9	30
4	Reliable	18	60
3	Moderately reliable	3	10
2	Slightly reliable	0	0
1	Not reliable	0	0

Table 7 demonstrates that a significant majority of students (83.3%) report strong or moderate confidence (rating = 4 and 5) about the future role of AI in education. A comparable proportion also expressed the likelihood of continuing to utilise AI tools in their academic pursuits. This alignment effectively presented students' proactive attitudes and their increasing reliance on AI technologies within their learning ecosystem. The results also underscored the perception of AI as a transformative factor in future educational practices rather than temporary assistance. Therefore, the students' willingness to engage with AI illustrated broader trends in higher education, where digital tools were increasingly integral for delivering personalised support, streamlining assessments, and enhancing learner engagement (Aoun, 2017; Lin & Chen, 2024). In contrast, institutions must address the ethical, technical, and accessibility challenges to realise this potential, which could affect long-term adoption fully. This outcome implied that promoting digital literacy and establishing transparent policies for AI use were essential for fostering trust and ensuring equitable implementation.

Table 7. Students' Beliefs About the Future Role of AI and Their Likelihood of Continued Use (n = 30)

Rating (1–5)	Belief in the Role of AI in Education	Number of Participants	Continued Use of AI Tools	Number of Participants
5	Strongly believe	13	Very likely	13
4	Believe	12	Likely	12
3	Neutral	5	Neutral	5
2	Slightly believe	0	Slightly likely	0
1	Do not believe	0	Not likely	0

5. CONCLUSION

This study successfully demonstrated the positive responses of undergraduate students enrolled in the BSc (Hons.) Physics and Industrial Physics programmes at UiTM for integrating AI within their academic environment. A significant number of students reported that AI-based tools improved their learning experiences by offering faster feedback, enhancing engagement, and supporting academic performance. Nonetheless, challenges regarding data privacy and algorithmic bias remained notable barriers to widespread adoption. These issues included limited personalisation, technical problems, and ethical concerns. Students also expressed a high likelihood of continuing to use AI in their studies. Nevertheless, many participants still appreciated the necessity of human oversight in certain areas, such as grading and assessment. These insights, derived from a limited and specific cohort, then provided a significant perspective on the initial stages of AI integration in a Malaysian science faculty. Overall, institutions should focus on increasing students' AI literacy, ensuring transparency in AI tools, and addressing infrastructure gaps to support the practical and ethical use of AI in higher education. Future studies should also utilise a broader sample and diverse institutional settings to explore students' perceptions and experiences with AI across the Malaysian higher education landscape. Additionally, future researchers should consider longitudinal designs, cross-disciplinary comparisons, and in-depth analyses of ethical and pedagogical implications to better inform sustainable AI integration strategies.

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CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest. This study was conducted independently and was not influenced by any personal, financial, or institutional interests that could affect the outcomes or interpretation of this study.

AUTHORS' CONTRIBUTIONS

The author solely carried out the conceptualisation, design, data collection, analysis, and writing of the manuscript.

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