

The Adoption of AI Tools for Academic Purposes Among Students

Mohd Lutfi bin Mohd Khidir^{1*}, Saiful Nizam bin Sa'ari², Sofwan bin Ramli³

^{1,2,3} Department of Electrical Engineering, Politeknik Sultan Abdul Halim Mu'adzam Shah.
mohdlutfi@polimas.edu.my

Abstract: This research analyses the patterns of the use of Artificial Intelligence (AI) applications by students of Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS) in relation to academic work. The study used a quantitative approach with a complete survey of all 2,636 students from five departments from Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS): JKA (745), JKE (449), JKM (234), JP (828) and JTMK (380). Out of the total, 1,380 were males and 1,256 were females. Results show that 61% of students reported using AI applications such as ChatGPT, Google Bard/Gemini and Bing AI for academic assignments (mean score = 3.71). Students expressed concerns regarding the accuracy of AI information (mean: 3.87) and the risk of plagiarism (mean: 3.77). Engineering students appeared to be more advanced in their use of AI compared to non-engineering students. The majority of students (73%) reported that they are willing to persist in using AI tools for other academic activities in the future, regardless of faculty detection or academic dishonesty. Most respondents (73%) strongly agreed that educational institutions ought to develop policies on the use of AI in teaching and learning activities within the school. While AI applications tremendously improve the academic efficiency and understanding realized by students, there is a growing gap for institutions aimed at guiding the students through the ethical use of AI technologies. Some of the recommendations consist of creating detailed programs on AI literacy, formulating appropriate policies for institutional frameworks, and restructuring evaluations to incorporate AI while maintaining scholastic honesty.

Keywords: *Keywords* Artificial Intelligence, Higher Education, Academic Assignments, Polytechnic Students, ChatGPT, Academic Integrity, Educational Technology

1.0 INTRODUCTION

The Artificial Intelligence (AI) technologies has rapidly evolved in recent years and transformed several sectors, with one of the most impacted being education. Generative AI tools like ChatGPT, Google Bard/Gemini, and Bing AI have all provided new advancements and difficulties for educational institutions globally (Michel-Villarreal et al., 2023). Students now have access to more sophisticated AI applications, which fundamentally changes the way they approach academic tasks, research, and learning.

In Malaysia, the use of AI technologies in education is in tandem with the nation's greater AI digital transformation strategy as well as the aim to build a knowledge-based economy. However, the implementation of AI tools in academic settings poses critical issues regarding the impacts on outcomes, academic integrity, and pedagogy (Mat Yusoff et al., 2025). Even though this issue is notable, there is a lack of research studying the patterns of AI utilization among polytechnic students in Malaysia.

This case study analyzes Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS), one of the prominent polytechnic institutions in Malaysia, to understand the usage level of AI applications by students in academic works. With its multitude of students in engineering and non-engineering programs, POLIMAS provides a rich context to study the differing levels of AI adoption and attitudes toward these technologies.

The aims of this case study include addressing the following guiding questions: (1) What is the frequency of AI application usage by POLIMAS students for academic assignments? (2) What is the general perception among students of the benefits and impediments of AI tools? (3) Are there any

notable differences in AI usage with regard to academic departments and gender? (4) What do students perceive as the major issues concerning academic integrity and faculty acceptance of work completed with the aid of AI? (5) In what ways do students anticipate the impact of AI on their educational and professional prospects?

Therefore, focusing on these issues helps identify the need for developing appropriate institutional policy, changing pedagogical frameworks, and educating learners about a reality where AI technologies are likely to assume a greater role in facilitating learning and working processes. As technologies develop at an unprecedented speed, they need to be strategically embedded into the education system in policies, structures, and curricula to avoid disrupting the quality and integrity of education. As such, this case study adds to existing literature on the role of AI in education, and, within the context of institutional frameworks and higher education policy, advance understanding on how AI can strategically be assimilated into advanced educational systems.

2.0 LITERATURE REVIEWS

2.1 The Development of AI Integration in the Education Sector

Over the last decade, the application of AI technologies in education have greatly shifted from particularized systems to general purpose tools that facilitate almost all learning activities. Chen et al. (2020) describes this progression, identifying the moving phases of AI from simple automation to advanced systems that go as far as learning assistance, feedback provision, and even rudimentary teaching. The emergence of more advanced generative AI technologies such as ChatGPT has further accelerated this shift towards transforming educational processes and opening new opportunities for content development, problem-solving, and knowledge exploration (Su & Yang, 2023).

In Malaysia, the use of AI technologies in education is synchronized with the nation's policies, which focus on innovations in technology and digital skills. Saman et al. (2024) note that there is an increasing trend of incorporating AI technologies among Malaysian higher education institutions, though the degree of adoption differs from one institution to the other. The authors argue that the integration of AI technologies is vital for effective engagement of

students in the context of the highly competitive digital economy and the rapid changes in technology.

2.2 Student Perceptions and Usage Patterns of AI Tools

The existing body of literature investigating perceptions of AI tools by students has produced different results in various educational settings. In particular, Khairuddin et al. (2024) reported that students from Malaysia, for instance, expressed relatively positive attitudes towards AI applications, considering them as helpful additions to learning resources. Their study noted that students predominantly applied AI tools for information fetching, content creation, and language translation. Likewise, Magantran (2023) reports that tertiary students in Malaysia perceive AI as a valuable asset to enhance their academic performance, although concerns regarding over-dependency and authenticity of AI-generated content still exist.

AI applications are bound to be used differently depending on the course of study, the context of the institution, and unique approaches to learning. Dahri et al. (2024) noticed that students in the technical disciplines used AI to a greater extent than those in the humanities and social sciences. These variations were explained by differences in the types of tasks, levels of digital proficiency, and the attitudes of faculty staff towards the use of technology in teaching.

2.3 Student Perceptions and Usage Patterns of AI Tools

The literature on student perceptions of AI tools in education tends to be quite divergent, and this is different for context. Khairuddin et al. (2024), for example, reported that students in Malaysia have a generally positive attitude toward AI applications and regard them as important resource supplements to traditional learning aids. Their study found that learners mostly employed AI tools for information searching, content generation, and language activities. Magantran (2023) also noted that educational AI tools are perceived positively by tertiary students in Malaysia, who believe that AI affords them greater opportunities to perform better academically, albeit with some apprehension regarding dependency and authorship of AI outputs.

Patterns of AI application usage differ markedly by academic discipline, institutional context, and personal preferences to learning. Dahri et al. (2024) remarked that students in technical areas of study, compared to those in the humanities and social sciences, had lower

rates of AI adoption. The reasons provided were differences in task demands, digital competencies, and faculty perceptions of technology use in Teaching and Learning Processes.

Students' utilization of AI technology demonstrates anthropological behavioral patterns associated with the adoption of new technologies. Mat Yusoff et al. (2025) noticed that students from Malaysian higher learning institutions apply AI for particular academic activities like assignment writing, topic research, and grammar verification, which is more frequent during exam and assignment periods.

2.4 Advantages and Disadvantages of AI in Academic Assignments

The literature reviewed makes a case for the incorporation of AI technology in academic activities due to its potential merits. Hooda et al. (2022) suggest that AI technologies have the capacity to improve educational outcomes by providing proper feedbacks, easing the workload of teachers through administration, and automating the grading processes. Finally, AI applications can enhance accessibility for students with varied learning capabilities by providing advanced teaching aids, immediate feedback, and self-paced learning opportunities (Pedro et al., 2019).

In regard to academic assignments, Ahmad et al. (2022) argue that AI tools enable students to enhance their written submissions, organize information more effectively, overcome cognitive linguistic hurdles, and address complex issues from multiple lenses. These advantages are quite valuable for students lacking sufficient English language skills and non-native speakers who have little experience with advanced level academic research.

At the same time, the use of technology and tools such as AI in academic work comes with considerable limitations. As AI appreciates the use of technology in education, numerous other issues emerge including ethical issues of academic honesty and integrity, data protection, privacy, digital discrimination, and erosion of critical reasoning skills (Williams, 2024). Concerns on plagiarism and ownership, particularly in relation to generative AI systems that create complex and sophisticated text autonomously, has become increasingly difficult to ignore (Kovari, 2025).

Responses from institutions to these challenges tend to differ greatly. According to Mironova et al. (2024), different countries seem to have adopted diverse approaches—some in higher education liberalized the use of AI as an educational tool, while others completely forbid its use. Consequently, the challenges posed by AI technologies should be addressed by

formulating distinct policies, ethical boundaries, and suitable evaluative measures to harness the possible beneficial effects of such technologies.

2.5 Institutional Policies and Guidelines for AI Use

Responding via developing institutional policies and guidelines for AI use in education facilitates the critically needed ‘reaction’ to the good and the bad of technology. Rane (2024) argues that such holistic policies need to incorporate guidelines on ethics, privacy, methods of assessment, and faculty professional development. These policies strike the balance between technological advancement and academic integrity while ensuring that AI integration does not disrupt the quality of educational services offered.

Focusing on Malaysian contexts, the integration of AI in educational systems has been slow to receive institutional attention. Mohsin et al. (2024) report that there appears to be a widespread acknowledgment from Malaysian higher education institutions about the need to address AI, but policies in dealing with this phenomenon tend to be reactionary rather than proactive. Diverse stakeholders, including students, faculty, administrators, and industry players, need to be actively engaged in the policy development process.

Policies that address responsible AI use in education should consider a range of other factors. Olohunfunmi and Khairuddin (2024) propose that effective guidelines must address technical, moral, pedagogical, and sociological aspects of AI Teaching tools integration. The authors argue that policies need to be flexible and dynamic in nature due to the ongoing developments in the field of AI and its use in education.

2.6 Future Directions for AI in Education

In the Almogren et al (2024), note the significance of having integrated approaches due to the adoption of mobile learning and social media into AI. This will inevitably lead to the development of a fully-fledged digital ecosystem which caters to the various educational needs. It has been noted that AI technology integration in teaching will also become widespread.

Baharin et al. (2024) emphasized the skills acquired through the use of AI technologies in educational contexts and how these help students transition into a workforce that is becoming more automated. Their findings from the TVET students’ research revealed that students were

eager to adopt AI technologies in the future, primarily due to perceptions about their relevance in future employment positions.

Jokhan et al. (2022) report the growing need to investigate and evaluate the tech's integration in education because of the rapid advancements in AI technology. The authors noted that there is a need for a more comprehensive understanding of technology in education by longitudinally investigating the effects AI has on learning, skills acquisition, and equity within education systems over an extended period of time. This type of investigation is vital in constructing policies and strategies focused on the beneficial use of AI technology in education and elimination of any associated risks.

3.0 METHODOLOGY

3.1 Future Directions for AI in Education

In this study, a cross-sectional survey was conducted to explore the use of AI applications amongst POLIMAS students for academic work in this AI-enabled world. The quantitative approach is suitable for the study, as it facilitates inference of the usage patterns, attitudes, and perceptions across varying demographic groups. This approach also captures the level of AI application usage during the period of study and aids in determining prevailing trends and attitudes towards these technologies.

3.2 Population and Sampling

The target population for this research included polytechnic students of northern state in Malaysia. The institution is composed of five major departments which are Jabatan Kejuruteraan Awam (JKA), Jabatan Kejuruteraan Elektrik (JKE), Jabatan Kejuruteraan Mekanikal (JKM), Jabatan Perdagangan (JP), and Jabatan Teknologi Maklumat dan Komunikasi (JTMK).

The study incorporated all departments to be proportionately represented through stratified random sampling. An analysis of means could be made between engineering departments (JKA, JKE, JKM) and non-engineering departments (JP, JTMK), as well as between male and female students and other demographic measures. With regards to the survey, data was gathered from a total of 2,636 respondents across various academic department which are 745 students from JKA, 449 students from the JKE, 234 students from JKM, 828 students

from JP and 380 from JTMK. Accordingly, in terms of gender, there were 1,380 male students and 1,256 female students which also corresponds to the polytechnic population gender.

3.3 Instrumentation

The primary data collection instrument was a structured questionnaire designed to examine the usage of AI applications by students. The questionnaire was designed following the review of existing literature relevant to the study's scope and objectives. Furthermore, the survey remained open for a period of two weeks to provide sufficient time for participant. The survey process followed a series of structured steps to ensure ethical compliance and broad participation. First, approval was obtained from the institutional research ethics committee and the relevant administrative bodies. Subsequently, an invitation to participate in the survey was posted on the institution's learning management platform. To enhance participation, departmental coordinators assisted in promoting the survey to students across all academic departments, thereby ensuring adequate representation. The survey was then administered online and remained open for a period of three weeks to allow ample time for responses. In addition, supplemental reminders were provided to encourage participation from students who had not yet completed the survey. Finally, upon closure of the survey, the collected data were exported to statistical analysis software for further processing and analysis. The attitude items in the questionnaire were measured by a five-point Likert scale, from "Strongly Disagree" (1) to "Strongly Agree" (5). This approach permitted the collection of quantitative data on students' responses, enabling mean scores and standard deviations to be calculated for each item.

3.4 Data Collection Procedure

The The survey was conducted during the first session of the 2024/2025 academic year and was administered online via the institution's learning management system, ensuring accessibility for all students. Participation was voluntary, and students were informed of the research objectives, with assurances that their responses would remain confidential. The implementation of the survey followed a series of structured steps. First, ethical clearance was obtained from the institutional research ethics committee and the relevant administrative bodies. Next, an invitation to participate was posted on the institution's learning platform. Department coordinators assisted in promoting the survey across all academic departments to ensure adequate representation. The survey remained open for three weeks to allow sufficient time for responses. Additionally, reminders were provided to encourage participation among

students who had not completed the survey. After the survey closed, the collected data were exported to statistical analysis software for further processing and analysis.

3.5 Data Analysis

The data retrieved from the survey were analyzed using several statistical methods. Descriptive statistics were used to summarize patterns and attitudes toward AI usage, including the computation of frequencies, percentages, means, and standard deviations. Comparative analyses were conducted using independent samples t-tests and one-way ANOVA to examine differences between groups, particularly between engineering and non-engineering departments, as well as across gender. Correlation analysis was performed using Pearson's correlation coefficient to assess the relationship between various aspects of AI usage and students' perceptions of AI usability. Reliability analysis was also conducted to evaluate the internal consistency of the survey items, with Cronbach's alpha used as the reliability estimate. The primary aim of the analysis was to identify key patterns, trends, and group differences in AI usage across demographic segments and academic departments, with particular emphasis on comparisons between engineering and non-engineering students, as well as gender-based differences in attitudes and usage behaviors.

4.0 DATA ANALYSIS AND FINDINGS

4.1 Overall AI Usage Patterns

Examination of POLIMAS student's responses suggests that there are specific patterns related to the use of AI technology. From Table 1, it can be seen that most students reported 'chat bot' usage for completing academic tasks with a mean score of 3.71 (SD = 0.95) on the five-point scale for the statement 'I frequently use AI applications such as ChatGPT, Google Bard/Gemini, Bing AI for academic assignments' given in the survey.

Table 1

Overall Statistics on AI Usage for Academic Assignments (N=2,636)

No.	Statement	Strong Disagree	Disagree	Partially agree	Agree	Strongly Agree	Mean	SD
1	I frequently use AI applications for academic assignments	69 (2.6%)	158 (6.0%)	798 (30.3%)	1051 (39.9%)	560 (21.2%)	3.71	0.95

2	AI occasionally provides inaccurate or irrelevant information	50 (1.9%)	130 (4.9%)	615 (23.3%)	1166 (44.2%)	675 (25.6%)	3.87	0.92
3	Using AI increases plagiarism risk in academic assignments	52 (2.0%)	161 (6.1%)	714 (27.1%)	1112 (42.2%)	597 (22.6%)	3.77	0.93
4	I'm concerned about instructors detecting and rejecting AI-assisted work	71 (2.7%)	157 (6.0%)	752 (28.5%)	1116 (42.3%)	540 (20.5%)	3.72	0.94
5	I will continue using AI for future academic assignments	74 (2.8%)	229 (8.7%)	874 (33.2%)	1038 (39.4%)	421 (16.0%)	3.57	0.95

The statistics reveal that 61.1 percent of students (those who responded “Agree” and “Strongly Agree”) acknowledged the application of AI tools in academic needs. Merely 8.6 percent of respondents claimed that they did not use AI applications (those who responded

“Strongly Disagree” and “Disagree”) and in contrast, 30.3 percent admitted to using them to some extent (Partially agree).

In relation to the kinds of AI applications utilized, students indicated that they used a number of tools for more than one academic function. Table 2 captures the data on how various students employ different artificial intelligence technologies for various academic activities.

Table 2

Overall Statistics on AI Usage for Academic Assignments (N=2,636)

No.	Response Category	Frequency	Percentage
1	Strongly Disagree	100	3.8%
2	Disagree	202	7.7%
3	Somewhat Agree	714	27.1%
4	Agree	1090	41.4%
5	Strongly Agree	530	20.1%
6	Mean Score	3.66	
7	Standard Deviation	1.00	

According to the data, 61.5% of students (which includes those who “Agree” and “Strongly Agree”) stated that they use different AI programs for such purposes as writing, researching, and grammar checking. This suggests that students not only use AI frequently, but also are utilizing these technologies for multiple academic activities.

4.2 Perceptions of the Benefits and Challenges of AI

As indicated in Table 3, AI technology is still relatively new which can lead to mixed feelings from students regarding its prospects and difficulties. The values presented in the table show the average responses given for the highlighted questions.

Table 3

Perceived Benefits of AI for Academic Assignments (N=2,636)

No.	Statement	Mean	SD
1	AI helps me complete academic assignments more quickly and efficiently	3.83	0.89
2	AI improves my understanding of complex academic material	3.97	0.87

3	AI helps improve my writing structure and grammar	3.88	0.89
4	AI provides useful creative ideas for assignments and projects	3.93	0.87
5	Using AI has helped improve my academic performance	3.75	0.91

The information suggests that learners derive notable advantages from AI applications, particularly with regard to improvement in comprehension of intricate academic work, which had the highest mean score of 3.97. Students also strongly supported the role of AI in generating creative concepts scoring (3.93), and improving writing organization and grammatical accuracy (3.88). Moreover, students recognized a number of challenges and concerns related to AI use, as highlighted in Table 4.

Table 4
Perceived Challenges and Concerns with AI Use (N=2,636)

No.	Statement	Mean	SD
1	AI sometimes provides inaccurate or irrelevant information	3.87	0.92
2	Using AI increases plagiarism risk in academic assignments	3.77	0.93
3	I'm concerned about instructors detecting and rejecting AI-assisted work	3.72	0.94
4	Relying on AI reduces my ability to think critically and independently	3.50	1.05

The issue regarding the dissemination of incorrect or non-related content received the highest mean score of 3.87, pointing to the fact that students, at AI's shortcomings, recognized that it does not provide reliable content. Concerns regarding the likelihood of students being accused of plagiarism also rated highly (3.77), as did concerns regarding the possible rejection of works assisted by AI tools (3.72). Interestingly, the assertion pertaining to diminished thinking power received the lowest mean score (3.50). This suggests that despite this being perceived as one of the challenges, the reason is that students regard this concern as less impactful than other issues.

4.3 Comparisons Between Engineering and Non-Engineering Students

The study provided insights on varying patterns of AI tool usage and perceptions such as those held by engineering students JKA, JKE, JKM and their counterparts from non-

engineering faculties JP, JTMK. The differences in mean score for selected items and the two groups is contained in Table 5.

Table 5

Comparison Between Engineering and Non-Engineering Students

No.	Statement	Engineering (N=1,428) Mean	Non- Engineering (N=1,208) Mean	Difference
1	I frequently use AI applications for academic assignments	3.77	3.64	0.13
2	AI occasionally provides inaccurate or irrelevant information	3.88	3.85	0.03
3	Using AI increases plagiarism risk in academic assignments	3.81	3.73	0.08
4	I will continue using AI for future academic assignments	3.65	3.48	0.17
5	AI helps me complete assignments more quickly and efficiently	3.89	3.75	0.14
6	AI improves my understanding of complex academic material	4.01	3.92	0.09
7	AI helps improve my writing structure and grammar	3.89	3.86	0.03
8	Using AI has helped improve my academic performance	3.81	3.68	0.13

The statistics show that engineering students AIs use more frequently (mean = 3.77) than their non-engineering counterparts (mean = 3.64). Their grade counterparts also demonstrated greater AI assistance intent for completing future tasks (mean = 3.65 compared to 3.48) and reported greater perceived assignment efficiency (mean = 3.89 compared to 3.75) and academic performance improvement (mean = 3.81 compared to 3.68). Remarkably, perceptions about AI's limitations and challenges were more or less the same for both groups with regards to the mean scores of the particular items about providing inaccurate information and plagiarism risks.

4.4 Gender Differences in AI Usage Patterns

The analysis has focused on the disparity of AI use within each gender and how they perceive AI differently. A comparative analysis of means for selected items for male and female students is provided in Table 6.

Table 6

Comparison Between Male and Female Students

No.	Statement	Male (N=1,380) Mean	Female (N=1,256) Mean	Difference
1	I frequently use AI applications for academic assignments	3.68	3.75	-0.07
2	AI occasionally provides inaccurate or irrelevant information	3.88	3.85	0.03
3	Using AI increases plagiarism risk in academic assignments	3.77	3.78	-0.01
4	I will continue using AI for future academic assignments	3.58	3.56	0.02
5	AI helps me complete assignments more quickly and efficiently	3.83	3.82	0.01
6	AI improves my understanding of complex academic material	3.96	3.98	-0.02
7	AI helps improve my writing structure and grammar	3.85	3.90	-0.05
8	Using AI has helped improve my academic performance	3.75	3.76	-0.01

The information provided shows insignificant differences by gender regarding AI usage behaviors and attitudes. For instance, female students AI reported using AI tools more frequently (mean = 3.75) than male students (mean = 3.68). Furthermore, their understanding of the subject and writing AI-performed tasks AI resulted in a marginally better value of 3.98 compared to 3.96 and for writing structure 3.90 vs. 3.85. However, these differences were not statistically significant ($p > 0.05$).

Both male and female students showed intention AI will be useful for their future assignments as well as having similar worries about the accuracy of the AI-generated information it provides and the plagiarism consequences associated.

4.5 Institutional Support and Guidelines

Students agreed on the necessity of fostering inclusion and developing policies related to AI usage in academia. Their sentiments are documented in Table 7 which captures the results from the question “Educational institutions should provide clear guidelines on the use of AI applications in academic assignments.”

Table 7

Need for Institutional Guidelines on AI Use (N=2,636)

No.	Response Category	Frequency	Percentage
1	Strongly Disagree	36	1.4%
2	Disagree	115	4.4%
3	Partially agree	565	21.4%
4	Agree	1278	48.5%
5	Strongly Agree	642	24.4%
6	Mean Score	3.90	
7	Standard Deviation	0.86	

The statistics suggest that students support institutional policies heavily, evidenced by 72.9% of learners endorsing (through "Agree" and "Strongly Agree" responses) the necessity for explicit policies within the academic setting pertaining to AI use. This is the highest figure on the entire survey, illustrating the students' need for guidance on the appropriate policies concerning the use of AI technologically by educational institutions. In the same fashion, students acknowledged the value of AI competences with regard to their prospective employment opportunities, as presented in Table 8.

Table 8

Need for Institutional Guidelines on AI Use (N=2,636)

No.	Response Category	Frequency	Percentage
1	Strongly Disagree	43	1.6%
2	Disagree	128	4.9%
3	Partially agree	609	23.1%
4	Agree	1155	43.8%
5	Strongly Agree	701	26.6%
6	Mean Score	3.89	
7	Standard Deviation	0.91	

A clear majority (70.4% with "Agree" and "Strongly Agree" responses) acknowledged AI as a helpful resource for post-secondary career preparation. This suggests students consider proficiency in AI to be essential not only for educational achievement but also for career advancement.

4.6 Intensity of AI Usage

The survey also evaluated the degree of AI application by inquiring if students employ AI for more than half of their academic work. The respondents' answers to this statement are given in Table 9.

Table 9

AI Utilization Exceeded 50% of Academic Tasks (N=2,636)

No.	Response Category	Frequency	Percentage
1	Strongly Disagree	107	4.1%
2	Disagree	343	13.0%
3	Partially agree	1043	39.6%
4	Agree	795	30.2%
5	Strongly Agree	348	13.2%
6	Mean Score	3.35	
7	Standard Deviation	1.00	

The figures show that 43.4 percent of students (in the “Agree” and “Strongly Agree” categories) said they used AI for over 50\% of their academic work, while 17.1 percent (in the “Disagree” and “Strongly Disagree” categories) claimed that they used AI for less than half of their work. A significant portion (39.6\%) identified as “Partially Agree,” indicating AI was used at moderate levels. Students in engineering reported higher levels of AI usage (mean = 3.41) as compared to non-engineering students (mean = 3.29), following the trend which indicates that engineering students tend to more heavily adopt AI technologies.

5.0 DISCUSSION

5.1 Trends and Effects of AI Use by Students

The results indicate that students heavily utilize AI applications, with more than 60 percent reporting regular use for academic activities. Such high rates of adoption are consistent with other reports from higher education institutions, as students tend to incorporate AI technologies into their academic practices (Dahri et al., 2024; Mat Yusoff et al., 2025). The degree of AI utilization among polytechnic students also contributes to the emerging body of evidence suggesting that the integration of AI technology is occurring outside traditional university settings, extending to more vocational and polytechnic shards of the educational landscape.

The finding that engineering students tend to adopt AI more than non-engineering students does track with earlier studies on cross-discipline differences in the engagement with technologies. Baharin et al. (2024) also found that students in more technical fields were more inclined to use learning aids powered by AI. There are possible explanations for this trend: the curricula of engineering programs tend to focus on problem-solving, more specialized students might have better skills in using computers, and engineering problems are more likely to be comprised of tasks which require calculation and analysis.

The slight differences in the use of AI by gender are more pronounced than the gaps in previous studies that revealed differences in technology adoption across gender, which is indicative of the limited barriers that AI tools as technologies seem to present relative to other tools, possibly due to their interfaces and design as well as the ease of access across different user groups. The observation that female students reported somewhat higher benefits from AI with regards to restructuring the writing and understanding complex materials calls for deeper scrutiny as it may indicate more nuanced differences in perspectives between the genders with regards to learning or levels of academic engagement.

The level of integration of AI tools into students' academic work is striking, with 43.4% of students declaring that they used AI for more than half of their academic assignments. This figure raises important questions about the nature of academic work in an age of AI. The data indicates that AI is no longer an occasional aid; it has become a permanent feature in the academic processes of a great number of students. The reality of education today requires a rethinking of aims, methods of evaluation, and competencies to be taught in the light of the realities of learning in the era of AI enhancement.

5.2 Benefits and Educational Value of AI Applications

The students' AI perceived benefits show how such technologies are altering the educational experience. For example, the value given to the students' improvement in understanding complex academic AI systems suggest that AI serves important teaching roles even beyond pedagogy. This finding supports Su and Yang's (2023) argument on generative AI's role as an educational clarifier and a concept gap bridge which democratizes access to sophistication and information.

The value offered by AI in supporting writing structure, particularly in terms of creativity, is considered to be at a high level. This indicates that AI plays a significant role in enhancing students' writing capabilities across various aspects. AI tools serve not only remedial functions such as helping students overcome language barriers but also developmental roles by modeling advanced structural and stylistic writing elements. These findings are consistent with the study by Ahmad et al. (2022), which demonstrated that AI applications positively influence and contribute to improvements in students' writing and knowledge organization skills.

The descriptive efficiency AI provides in completing academic tasks indicates the practical reliance these tools bring towards balancing academic workloads. However, the mean score for this item lower than for understanding and creativity suggests that students place more importance on AI's contribution to the learning process rather than the value of time saved. This perspective goes beyond the simplistic view of AI solely as a convenience, emphasizing a deeper engagement with the functionality of artificial intelligence in the learning context.

Students' belief that AI has improved their academic performance indicates really available tangible educational outcomes as a result of AI incorporation. Although this study did not evaluate the actual performance improvements, the increase compared to the perceived value in enhanced outcomes is consistent with Dahri et al. (2024) who documented positive relationships between adoption of AI tools and academic performance among Malaysian students. This illustrates that AI applications do not merely act as tools for completing

assignments, but rather act as performance enhancers, providing guidance toward a level of achievement and learning.

The aggregate advantages of AI associated with deeper comprehension, advanced writing skills, creative thinking, and overall academic performance provide a holistic impression of AI as an educational tool that caters to various aspects of the learning process. Such composite functionality corroborates Pedro et al.'s (2019) stance on AI's transformative power across numerous educational parameters, including how students create content, access information, and cultivate skills.

5.3 Concerns and Challenge in AI Integration

Students highlighted particular concerns related to the applications of AI in education, showing that, at least, they understood the risks and limitations associated with such technologies. The mean score of 3.87 for concern about misinformation or irrelevant information suggests that there is concern regarding the inaccuracy of AIs, highlighting that critical views do exist, which challenges the view that AI is a reliable fountain of information. This substantiates Williams' (2024) position that users understand the importance of content verification, demonstrating the need for evaluative approaches towards information produced by AI.

The strong concern over the potential for plagiarism indicates students' understanding of the integrity issues related to AIs. This concern becomes more significant respondents indicated that they used AI for over half of their assignments. This puts actual tendencies at odds with the acknowledgment of risks, which is itself concerning. This is the same as Kovari's (2025) observation that, despite acknowledging possible academic integrity challenges, students still use AI tools extensively. Such a reality illustrates the struggle with new technologies and their relationship to older academic frameworks.

Students are highly concerned about instructors finding out and penalizing work completed with AI assistance, highlighting the ambiguity of the institution's approach to AI. This aligns with Mironova et al. (2024), noting that students experience anxiety regarding boundaries of acceptable usage due to institutional policies lacking coherent frameworks on AI. The elevated concern level indicates that institutional policies delineating the acceptable boundaries of AI use alongside an active dialogue would reduce student stress.

The moderate concern about the loss of critical thinking skills shows that students understand the cognitive implications AI reliance entails, but not the immediate dangers of accuracy and academic integrity. This comes in support of Nguyen (2025), who posited that

students recognize the advantages of AI technology on cognitive processes while being aware of the adverse implications, thus suggesting a more developed understanding than assumed.

5.4 Institutional Policies and Instructional Implementation

The remarkable acceptance level regarding institutional policies on the use of AI is one of the most notable findings of the study, perhaps emphasizing a need for support in navigating the multifaceted reality of AI within the educational features AI usage, technologies, and tools which, I believe, is a core concern for students. This overwhelming support resonates with Rane's (2024) claim that schools need to develop policies that address the ethical, pedagogical, and practical concerns related to the implementation of AI tools in educational processes.

The strong acknowledgment of AI as important for career preparation by students demonstrates the understanding of the implications of having AI competencies in professional contexts beyond academia. This outlook supports Almogren et al.'s (2024) argument that exposure to AI in education amplifies the expectation of employability in an economy where AI is ubiquitous. The especially high appreciation of AI's importance to careers among students in engineering (mean = 3.95) indicates that the observation about the alignment of professional expectations with the education system in technical disciplines is valid.

The results underscore many pathways for institutional AI integration incorporating adaptability. Firstly, the widespread use in multiple AI is not confined to a single department AI is not treated as a peripheral educational tool, as its extensive usage now mandates comprehensive institutional responses. Secondly, major apprehensions regarding precision and attributes suggest the presence of pedagogical frameworks aimed at teaching with and about AI, including the authoritative and evaluative processes of AI content authorship attribution. Thirdly, the overwhelming expectation of policies underscores a policy void where institutions can proactively create policies aimed at alleviating the ambiguity within which AI operates in education while still harnessing its advantages.

5.4 Institutional Policies and Instructional Implementation

The striking differences in the rates of adoption AI technology among engineering students compared to non-engineering students signals important differences of integration of technology on a disciplinary level. This supports earlier findings by Baharin et al. (2024) who noted similar differences within Malaysian TVET institutions. The pattern indicates that a more refined educational policy AI integration frameworks is needed, sensitive to disciplinary contexts distinguishing between technical and non-technical fields.

The engineering students' will continue using AI for future assignments more than their counterparts cited reason showing they plan on using it more in the future highlighting a greater sustained commitment towards its adoption within technical disciplines. This resonates with Mohsin et al. (2024) where students in technical disciplines tend to perceive AI enabled technologies as fundamental to their career advancement rather than subset of academic tools, suggesting greater alignment of educational paradigms with industry expectations in these sectors.

The challenging stereotypes regarding the use of technology in pedagogical frameworks in relation to gender undergo scrutiny with the almost nonexistent differences between the two genders in regard to perception and usage of AI technology misconception activities. The students of both genders exhibited similar levels in relation to the use, advantages, and issues regarding AI with mean score differences of less than a tenth on a scale on almost all items. This is in contrast to some earlier studies that documented significant gender gaps in educational technology adoption and implies that AI tools may have less gendered access and usage restrictions than other technologies.

The observation that female students reporting more AI-related benefits in writing and AI-aided understanding constitutes an overarching trend is subtle but significant. This parallels with Mat Yusoff et al (2025) where female students were noted to likely define the use of AI technologies at lower sensor levels than their male counterparts, suggesting that there are in fact different patterns between genders in the employment of AI technologies in learning.

5.5 Conclusion

The study offers a thorough analysis of how POLIMAS students use AI technologies for completing academic assignments alongside other educational tools, adding new empirical data from the polytechnic institution in Malaysia. The research provides several useful insights that help comprehend the ever-growing integration of AI technologies into educational practices:

High adoption rates: The largest portion of POLIMAS students reported using AI applications for academic-related activities and nearly half of them use AI for over half of their educational endeavors. This points out that there is a notable adoption of AI technology by students. Multifaceted benefits: In the case of Ai applications, students cited major educational benefits such as improved understanding of intricate materials, better structure of writings, invention of new ideas, and better performance. The impacts

of these benefits are not only on efficacy but also on the multiple facets of the learning experience.

Recognition of limitations: Notwithstanding the high use rates, students point out very important limitations of AI applications, such as irrelevant information, plagiarism and damage to critical thinking. This denotes an understanding of the advantages and disadvantages of AI.

- a) Disciplinary variations: Engineering students showed significantly higher AI adoption rates, AI Intention to Use scores, and stronger post-study intentions compared to non-engineering students. This suggests important differences between disciplines in terms of educational technology adoption and attitudes toward the use of AI.
- b) Most students did not have a strong perception AI as providing educational value suggesting that AI is not perceived to augment the learning process in educational settings.
- c) Mismatch in perception and reality—minimal gender AI gap: While definitive behavioral differences were documented, the study only observed gaps in perception AI usage and interactions, which indicates a lesser gender disparity than expected. This gap suggests preexisting societal assumptions regarding gender divides in technology adoption remains unchallenged. This also indicates that in general, AI technologies possess limited structural gender inequalities in terms of access and utilization.
- d) Recognition of AI's professional implications: 70.4 % of polled students acknowledged the relevance of incorporating AI technology into their professional development programs suggesting that students understand the value and importance of information technology skills in AI-augmented professional environments. This sentiment was strongest among students from the engineering faculty. The data suggests that polytechnic students experience AI as an integral aspect of educational engagement which impacts teaching, assessment, institutional governance, and competencies frameworks.

This research shows how AI tools have permeated the academic lives of POLIMAS students, affecting pedagogy and learning in remarkable ways. The explanation provided for high adoption rates, perceived pedagogical value, and

acknowledged shortcomings suggest engagement with these technologies as critical in the context of educational, social, and technological interactions, as opposed to mere acceptance or outright dismissal.

The results indicate that there is a need to respond institutionally to balance the use of AI's educational value with preserving core academic integrity and educational fundamentals. As rapidly evolving AI technologies are integrated into education, institutions need to design proactive systems that allow students to interact with these technologies while safeguarding foundational knowledge and critical reasoning skills vital in an AI-enhanced landscape.

The results provide specific insights for POLIMAS, including the development of comprehensive educational policies focusing on AI governance, curriculum changes and the development of instructional materials that foster AI literacy, revision of evaluation strategies for appropriateness in AI-influenced contexts, and faculty training to address issues posed by new innovations in teaching and learning technologies.

More broadly, this research study adds to the understanding of how practices in the educational sector are changing with the introduction of AI technologies and contributes to informing institutional framework decisions, advanced research policy, and researches the implications of AI technologies on higher education systems. With the increasing application of AI technologies in academic settings, further exploration and careful consideration by institutions will be necessary to ensure the maintenance and improvement of educational standards and integrity.

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