

Generative Artificial Intelligence in Higher Education: Adoption and Academic Integrity Perceptions among Malaysian Undergraduates

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ABSTRACT

The increasing accessibility of generative artificial intelligence (GenAI) tools is transforming academic practices in higher education. This study investigates the adoption of generative AI among undergraduate students in Malaysia, with particular attention to usage patterns, perceived academic benefits, and perceptions of academic integrity. A quantitative survey was conducted with 166 respondents, and the data were analysed using descriptive statistics, analysis of variance (ANOVA), and independent t-tests. The findings indicate a high level of generative AI adoption, with 97.6% of students reporting using AI tools for academic purposes. ChatGPT and Canva emerged as the most frequently used tools. Respondents generally perceived generative AI as beneficial for completing academic tasks, understanding course content, solving study-related problems, and enhancing the quality of academic work. At the same time, concerns were reported about plagiarism, overreliance on AI, and the need to disclose AI-assisted work in academic submissions. Inferential results further suggest that, although selected demographic differences exist in the use of certain tools and in some usage-related perceptions, perceptions of academic integrity are broadly consistent across age, gender, and level of study. These findings underscore the growing role of generative AI in higher education and the need for institutional policies that promote ethical, transparent, and responsible use.

Keywords: Generative AI; higher education; student learning; academic integrity; SDG 4

INTRODUCTION

Generative artificial intelligence (AI) tools are rapidly reshaping academic practices in higher education. Tools such as ChatGPT, Google Gemini, Grammarly, and other AI-enabled applications are increasingly used by students to generate text, build prototypes, paraphrase content, refine language, and support academic tasks. In higher education, generative AI is increasingly positioned as both an opportunity and a challenge. It may enhance learners' access to explanations, learning resources, and academic support, while also raising concerns about academic integrity, over-reliance, and unclear boundaries for acceptable use.

From the perspective of Sustainable Development Goal 4 (SDG 4), which emphasises inclusive and equitable quality education, the rise of generative AI is particularly significant. Digital learning tools can contribute to SDG 4 by improving learners' access to educational support, reducing barriers to comprehension, and strengthening learning confidence. However, quality also implies that learning is meaningful, responsible, and aligned with ethical academic practices. If generative AI is used primarily as a shortcut, especially in assessment contexts, its educational value may be undermined, and the integrity of academic outcomes may be compromised. Therefore, understanding how students use generative AI, what value they perceive from it, and where they draw ethical boundaries is essential for universities aiming to integrate generative AI in ways that strengthen, rather than weaken, educational quality.

Existing literature presents generative AI as both an opportunity and a challenge in higher education. On one hand, prior studies suggest that generative AI can support learning through rapid feedback, personalised

assistance, and increased access to academic support. On the other hand, the literature also highlights concerns relating to plagiarism, reliability, privacy, fairness, and overreliance on AI-generated responses. In addition, the increasing capability of generative AI to produce convincing academic text has raised concerns about assessment credibility and the limitations of AI-detection approaches. These concerns suggest that higher education institutions must move beyond viewing generative AI only as a technological innovation and instead address its implications for pedagogy, assessment, and academic integrity (Alier et al., 2024; Bennett & Abusaleem, 2024; Ghosh, 2025a, 2025b; Hwang & Chen, 2023; Sousa & Cardoso, 2025; Yu & Guo, 2023).

Although discussions of generative AI in higher education are expanding rapidly, there remains a need for empirical evidence on how students use these tools and how they perceive their academic and ethical implications. Understanding students' adoption patterns, preferred tools, perceived academic benefits, and views on academic integrity is important for informing institutional policies and educational practices.

Accordingly, this study investigates the use of generative AI tools among undergraduate students in Malaysia. The study focuses on three main aspects: the types of AI tools students use, the perceived usefulness of these tools in academic work, and students' perceptions of academic integrity in relation to generative AI use.

METHODOLOGY

Research Design

This study employed a quantitative cross-sectional survey design to examine the use of generative AI tools among undergraduate students in Malaysia. The study focused on three key aspects: the types of generative AI tools students use, the perceived academic uses of these tools, and students' perceptions of academic integrity in relation to generative AI-assisted academic work. A quantitative approach was appropriate because the study aimed to identify overall usage patterns and compare responses across selected demographic variables.

Participants

A total of 166 undergraduate students participated in the study. The respondents varied in age, gender, and level of study. The average age of the respondents was 21.19 years with a standard deviation of 1.79, while the skewness value of 0.177 indicated that the age distribution was approximately normal. Most respondents were enrolled in bachelor's degree programs (77.1%), and the majority were between 21 and 23 years old (57.2%). These respondent characteristics provided an appropriate basis for examining variations in AI use and perceptions across demographic categories.

Research Instruments

Data were collected using a structured questionnaire consisting of three sections. The first section gathered demographic information, including age, gender, and level of study. The second section focused on the use of selected GenAI tools for academic purposes, including ChatGPT, Grammarly, QuillBot, Google Gemini, Canva, Microsoft Copilot, and Notion AI. The third section examined respondents' perceptions of the academic usefulness of generative AI tools and their views on academic integrity issues associated with AI use, including plagiarism, disclosure of generative AI use in academic submissions, and overreliance on generative AI.

Data Analysis

The data were analysed using the Statistical Package for the Social Sciences (SPSS). Both descriptive and inferential statistical techniques were employed. Descriptive statistics, including mean, standard deviation, and mode, were used to summarise the demographic profile of the respondents and the overall response patterns regarding generative AI use and academic integrity perceptions. For inferential analysis, one-way analysis of variance (ANOVA) was conducted to examine whether there were statistically significant differences in the mean responses across age groups. In addition, independent t-tests were performed to compare mean

differences by gender and study level. The analyses were conducted at a 95% confidence level, and statistical significance was determined using a p-value threshold of 0.05. Where the p-value was less than 0.05, the null hypothesis was rejected, indicating a statistically significant difference between groups.

RESULTS

Respondent Profile

A total of 166 undergraduate students participated in the study. The respondents had a mean age of 21.19 years (SD = 1.79), and the skewness value of 0.177 indicates that the age distribution was approximately normal. As shown in Table 1, the respondents were predominantly 21–23 years old, mostly female, and mainly enrolled in a bachelor's degree program. Overall, these findings indicate that the sample largely reflects a typical undergraduate student population.

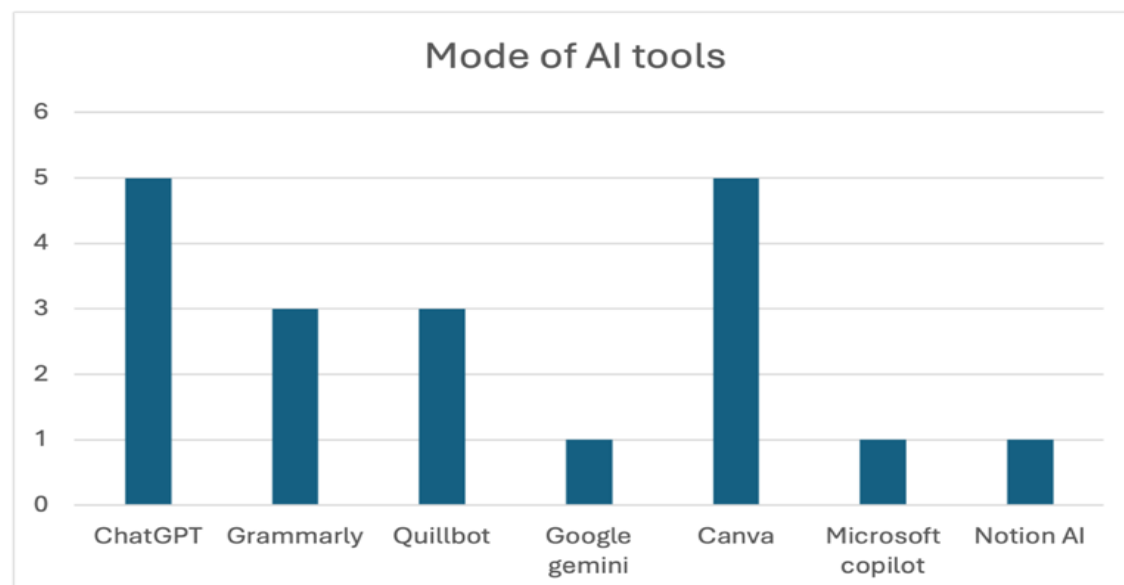
Table 1. Demographic Characteristics of Respondents (N=166).

Demographic Characteristic	Item	Percentage (%)
Age	18-20 years old	34.9
	21-23 years old	57.2
	24-26 years old	7.8
Gender	Male	41
	Female	59
Level of Study	Diploma	22.9
	Bachelor's Degree	77.1

Use of Generative AI Tools

The findings indicate a very high level of generative AI adoption among the respondents. Specifically, 97.6% of students reported using generative AI tools for academic purposes. This suggests that generative AI is already embedded in students' academic routines and is no longer a marginal or occasional support technology. As shown in Figure 1, ChatGPT and Canva emerged as the most frequently used tools, indicating students' preference for tools that support both text-based academic assistance and content creation.

Figure 1. Mode of AI tools used by respondents.



The ANOVA results in Table 2 show that age and AI tools indicate significant differences for ChatGPT ($F = 6.293$, $p = 0.002$) and QuillBot ($F = 15.694$, $p < 0.01$). In contrast, no significant differences were found for Grammarly, Google Gemini, Canva, Microsoft Copilot, and Notion AI.

Table 2. ANOVA Results between Age and AI Tools.

Variable	f-value	p-value	Significance
ChatGPT	6.293	0.002	Reject H_0
Grammarly	1.277	0.282	Accept H_0
Quillbot	15.694	<0.01	Reject H_0
Google Gemini	1.421	0.244	Accept H_0
Canva	0.007	0.933	Accept H_0
CoPilot	0.660	0.518	Accept H_0
Notion AI	0.882	0.406	Accept H_0

The independent t-test results in Table 3 show that gender and the listed AI tools do not differ significantly. This indicates that male and female respondents reported similar patterns of AI tool use.

Table 3. Independent t-test Results between Gender and AI Tools.

Variable	t-value	p-value	Significance
ChatGPT	0.164	0.686	Accept H_0
Grammarly	0.003	0.955	Accept H_0
Quillbot	0.580	0.448	Accept H_0
Google Gemini (formerly Bard)	2.440	0.120	Accept H_0
Canva	3.480	0.064	Accept H_0
Microsoft Copilot	1.533	0.217	Accept H_0
Notion AI	1.179	0.279	Accept H_0

The independent t-test results in Table 4 show that the level of study and AI tools reveal significant differences for ChatGPT ($t = 5.196$, $p = 0.024$), Canva ($t = 5.301$, $p = 0.023$), and Microsoft Copilot ($t = 4.167$, $p = 0.043$). No significant differences were found for Grammarly, QuillBot, Google Gemini, and Notion AI.

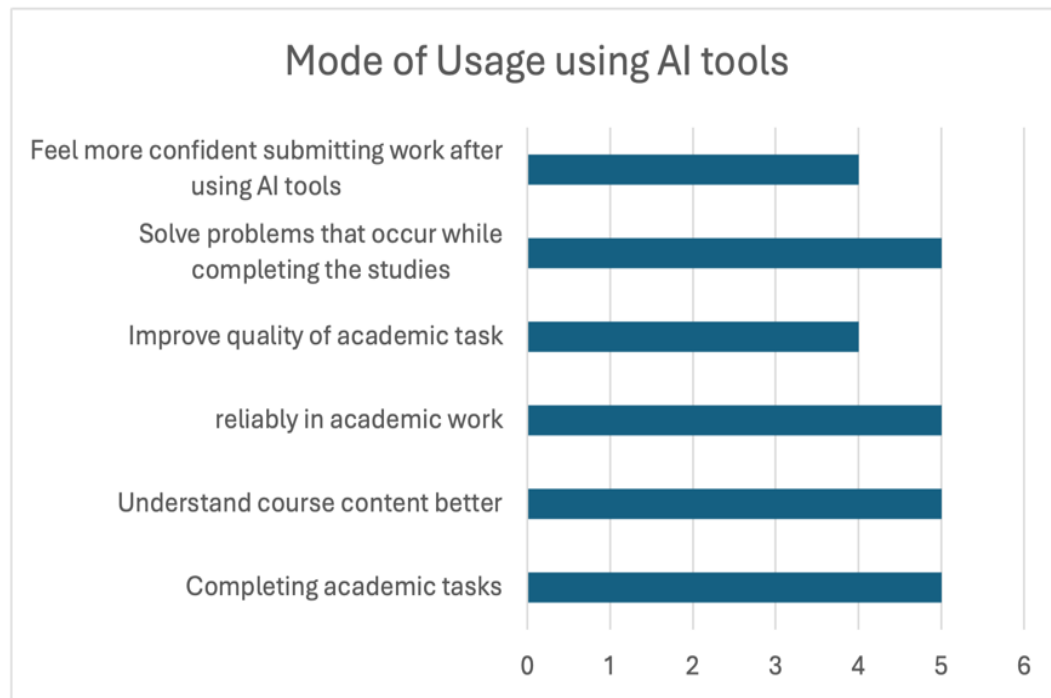
Table 4. Independent t-test Results between the level of study and AI Tools.

Variable	t-value	p-value	Significance
ChatGPT	5.196	0.024	Reject H_0
Grammarly	1.761	0.186	Accept H_0
Quillbot	2.537	0.113	Accept H_0
Google Gemini (formerly Bard)	0.027	0.870	Accept H_0
Canva	5.301	0.023	Reject H_0
Microsoft Copilot	4.167	0.043	Reject H_0
Notion AI	1.947	0.165	Accept H_0

Perceived Academic Uses of AI Tools

The results, as shown in Figure 2, also indicate that students generally perceive generative AI tools as useful for academic purposes. The dominant responses show strong agreement that AI tools help complete academic tasks, better understand course content, solve problems encountered during study, and support academic work more effectively. These findings suggest that students regard AI as more than a convenience tool; rather, they see it as a meaningful academic support resource.

Figure 2. Mode of Usage using AI tools.



As shown in Table 5, the ANOVA results show limited demographic variation in students' perceptions of AI usefulness. For age, most usage-related items did not differ significantly across groups.

Table 5. ANOVA Results between Age and Usage of AI Tools.

Variable	f-value	p-value	Significance
Useful for completing academic tasks	1.587	0.208	Accept H ₀
Understand course content better	0.594	0.553	Accept H ₀
Reliable in academic work	3.899	0.221	Accept H ₀
Improve the quality of the academic tasks	2.394	0.094	Accept H ₀
Solving problems that occur while completing the study	2.114	0.124	Accept H ₀
Feel more confident submitting work	0.965	0.385	Accept H ₀

The independent t-test results for gender and AI tool usage indicate significant differences for "understand course content better" ($t = 5.961$, $p = 0.016$) and "reliably in academic work" ($t = 6.324$, $p = 0.013$). As shown in Table 6, the remaining usage items did not differ significantly between male and female respondents.

Table 6. Independent t-test Results between Gender and Usage of AI tools.

Variable	t-value	p-value	Significance
Useful for completing academic tasks	0.178	0.674	Accept H ₀

Understand course content better	5.961	0.016	Reject H _o
Reliable in academic work	6.324	0.013	Reject H _o
Improve the quality of the academic tasks	0.658	0.418	Accept H _o
Solving problems that occur while completing the study	0.000	0.994	Accept H _o
Feel more confident submitting work	0.283	0.595	Accept H _o

Table 7 reports that the independent t-test results for the level of study and AI tool usage show no significant differences across all items. This suggests that diploma and bachelor's degree students reported similar views regarding the usefulness of generative AI in academic work.

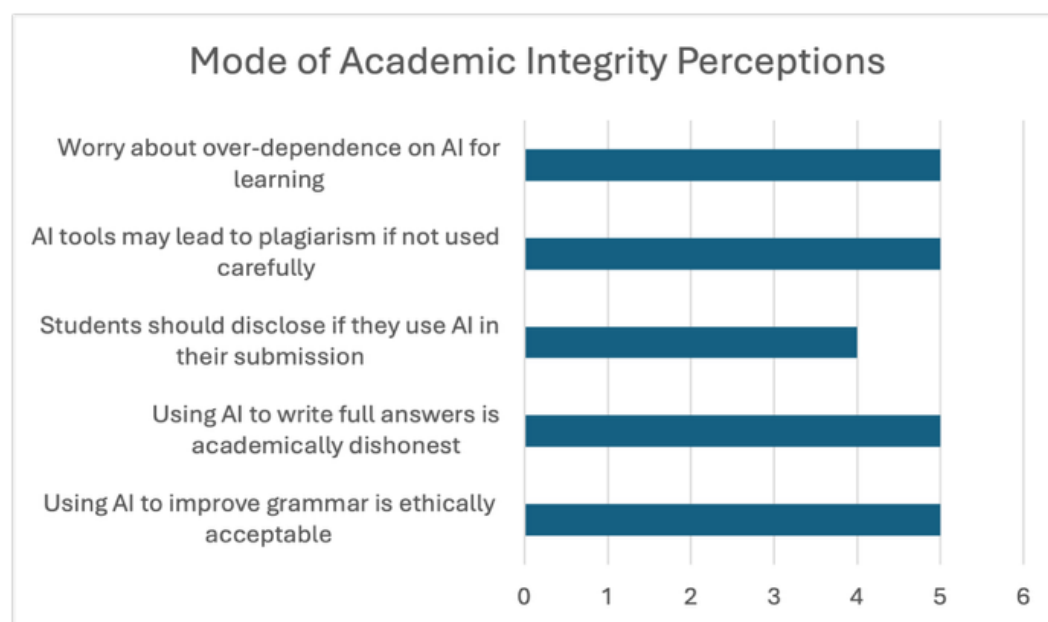
Table 7. Independent t-test results for the level of study and the use of AI tools.

Variable	t-value	p-value	Significance
Useful for completing academic tasks	0.211	0.646	Accept H _o
Understand course content better	0.244	0.622	Accept H _o
Reliable in academic work	0.062	0.804	Accept H _o
Improve the quality of the academic tasks	3.740	0.055	Accept H _o
Solving problems that occur while completing the study	0.366	0.546	Accept H _o
Feel more confident submitting work	0.077	0.782	Accept H _o

Academic Integrity Perceptions

The findings further show that respondents were aware of important ethical issues related to the use of generative AI in academic work. As presented in Figure 3, most respondents strongly agreed that using AI to improve grammar is ethically acceptable, that using AI to write full answers is academically dishonest, that AI tools may lead to plagiarism if not used carefully, and that overdependence on AI for learning is concerning. They also agreed that students should disclose the use of generative AI in their submissions.

Figure 3. Mode of Academic Integrity Perceptions.



The ANOVA results in Table 8 show that there are no significant differences across all items in age and academic integrity perceptions.

Table 8. ANOVA Results between Age and Academic Integrity Perception.

Variable	f-value	p-value	Significance
Improving grammar is ethically acceptable	0.073	0.930	Accept H _o
Writing full answers is academically dishonest	0.534	0.587	Accept H _o
Students should disclose if they use AI in their submissions	0.496	0.610	Accept H _o
AI tools may lead to plagiarism if not used carefully	1.204	0.303	Accept H _o
Worrying about over-dependence on AI for learning	1.208	0.301	Accept H _o

Similarly, the independent t-test results between gender and academic integrity perceptions indicate no significant differences across all items, as shown in Table 9.

Table 9. Independent t-test Results between Gender and Academic Integrity Perception.

Variable	t-value	p-value	Significance
Improving grammar is ethically acceptable	0.160	0.690	Accept H _o
Writing full answers is academically dishonest	0.019	0.891	Accept H _o
Students should disclose if they use AI in their submissions	0.000	0.989	Accept H _o
AI tools may lead to plagiarism if not used carefully	1.164	0.282	Accept H _o
Worrying about over-dependence on AI for learning	1.430	0.233	Accept H _o

Table 10 shows that the independent t-test results for the level of study and academic integrity perceptions reveal no significant differences across all items.

Table 10. Independent t-test Results of Level of Study and Academic Integrity Perception.

Variable	t-value	p-value	Significance
Improving grammar is ethically acceptable	0.739	0.391	Accept H _o
Writing full answers is academically dishonest	0.213	0.645	Accept H _o
Students should disclose if they use AI in their submissions	1.040	0.309	Accept H _o
AI tools may lead to plagiarism if not used carefully	0.380	0.539	Accept H _o
Worrying about over-dependence on AI for learning	0.219	0.640	Accept H _o

DISCUSSION

The findings indicate that generative AI has become highly prevalent among undergraduate students. The very high adoption rate suggests that generative AI is already integrated into students' academic routines rather than being used only occasionally. The popularity of ChatGPT and Canva further reflects students' preference for tools that support both written academic work and content creation.

The study also shows that students generally perceive generative AI positively in relation to their academic work. They reported that generative AI helps them complete tasks, understand course content, solve study-related problems, and improve the quality of their academic output. These findings suggest that students view generative AI as a practical academic support technology rather than merely as a shortcut for completing assignments.

At the same time, the findings show that students are not uncritical in their use of generative AI. Despite the high level of adoption and positive perceptions of use, respondents also expressed concern about plagiarism, academic dishonesty, overreliance on generative AI, and the importance of disclosing generative AI use in academic submissions. This indicates that students are aware that the use of generative AI must remain within ethical and academically acceptable boundaries.

The inferential findings further suggest that demographic differences are limited and selective. Some significant differences were found for certain generative AI tools and selected usage-related perceptions, but academic integrity perceptions remained largely consistent across age, gender, and level of study. This may indicate that, while students differ in their tool preferences and specific experiences, ethical concerns about the use of generative AI are shared more broadly across demographic groups.

These findings have important implications for higher education institutions. Since students are already using generative AI extensively, universities should move beyond treating it solely as a threat and develop clear guidance on acceptable and unacceptable forms of AI-assisted academic work. Institutional efforts should focus on academic integrity policies, disclosure expectations, and educational support that help students use generative AI responsibly, critically, and transparently.

Policy Matrix Responsible Generative AI Usage in Higher Education

Based on these implications, Table 11 proposes a concise policy matrix to guide the responsible use of generative AI in higher education.

Table 11. Policy Matrix for Responsible Generative AI Usage.

Use Case	Status	Disclosure Expectation	Suggested Disclosure Wording
Brainstorming ideas, keywords, or outlines	Acceptable with acknowledgement when substantively used	Recommended	"Generative AI was used to support brainstorming and idea development."
Grammar correction, readability improvement, and language polishing	Acceptable with acknowledgement when substantial	Recommended	"Generative AI-assisted tools were used for grammar and language refinement."
Summarising lecture notes or readings for personal study	Acceptable for study support	Usually not required unless submitted as coursework output	"AI was used to summarise source materials for study preparation."
Explaining difficult concepts or generating practice questions	Acceptable for learning support	Usually not required unless directly embedded in submitted work	"AI was used as a supplementary study aid to clarify concepts."
Generating draft paragraphs that are then critically revised by the student	Conditionally acceptable	Required	"A generative AI tool was used to produce an initial draft, which was subsequently reviewed, revised, and validated by the author."
Generating code, calculations, or technical outputs used in submitted work	Conditionally acceptable	Required	"Generative AI was used to assist with code/problem-solving, and all outputs were reviewed and validated by the author."

Producing final answers for direct submission without meaningful revision	Unacceptable	Not applicable	Not permitted
Fabricating references, quotations, data, or evidence	Unacceptable	Not applicable	Not permitted
Using AI to complete take-home tests or assignments where independent work is required	Unacceptable unless explicitly allowed	Required only if institution permits limited use	Not permitted unless authorised by course policy
Concealing substantive AI assistance in assessed work	Unacceptable	Not applicable	Not permitted

Limitations

Despite its contributions, this study has several limitations that should be considered when interpreting the findings.

This study has several limitations that should be considered when interpreting the findings. Firstly, the study was based on a relatively small sample of undergraduate students from a single national context, which limits the generalisability of the findings to other institutions, student populations, and educational settings. In addition, the study used a non-probability survey approach, and the respondent profile was uneven across some demographic categories, particularly the oldest age group. As a result, the findings should be interpreted as context-specific rather than broadly representative.

Secondly, the study relied on self-reported questionnaire data. While self-report is useful for examining student perceptions, it does not directly capture actual behaviour. Accordingly, the findings reflect perceived use of generative AI and perceived academic integrity concerns rather than observed AI-use practices, disclosure behaviour, or actual misconduct. The study also did not triangulate survey responses with other data sources, such as interviews, focus groups, learning management system records, or AI use logs.

Thirdly, the present study examined academic integrity primarily at the perceptual level. Although this provides useful insight into students' ethical awareness, it does not establish how students actually behave in assessment contexts. Future studies should therefore extend this work by examining observed practices, disclosure patterns, and discipline-specific uses of generative AI.

Finally, the current study would be strengthened by broader psychometric and statistical reporting, including fuller evidence of instrument reliability and validity, checks of assumptions, and effect sizes. Future research should also consider larger multi-institutional samples, more balanced demographic distributions, and mixed-method or log-based designs to provide a more comprehensive understanding of how generative AI is used in higher education.

CONCLUSION

This study examined the adoption of generative AI among undergraduate students in Malaysia, with particular attention to their patterns of use, academic purposes, and perceptions of academic integrity. The findings reveal that generative AI is already widely used in higher education, with most students reporting using AI tools for academic purposes. ChatGPT and Canva were among the most-used tools, and students generally perceived generative AI as beneficial for completing academic tasks, understanding course content, solving study-related problems, and improving the quality of academic work. At the same time, students demonstrated awareness of important ethical concerns, particularly plagiarism, overreliance on generative AI, and the need to disclose use of generative AI transparently.

Overall, the findings suggest that generative AI has become an important academic support technology, but its increasing presence in higher education also requires appropriate institutional responses. Higher education institutions should develop clear policies and educational strategies to guide students toward ethical, transparent, and responsible use of generative AI. Future research may extend this work by examining actual usage behaviours, disciplinary differences, or institutional responses to generative AI in teaching and assessment.

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Ai Usage Declarations

The authors used ChatGPT to assist with drafting and rephrasing text and Grammarly to assist with grammar and language polishing. All outputs were critically reviewed and revised by the authors. The authors remain fully responsible for the accuracy of the information presented, the analysis, and the conclusions.

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