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Concern to Acceptance: A Recurrent Study of Students' Perspectives on GenAI in Higher Education

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Abstract

Generative artificial intelligence has rapidly moved from novelty to routine presence in higher education, yet student attitudes towards its use continue to reflect tensions between perceived benefits and persistent concerns. Framed by Ajzen's Theory of Planned Behavior, this study examined how newly enrolled university students' intentions and behaviors toward generative artificial intelligence changed between 2023 (n = 353) and 2025 (n = 258). Recurrent cross-sectional survey data were collected from students at an Australian university, combining quantitative data on use, comfort, beliefs, and concerns with open-ended qualitative responses analysed thematically. Results showed a substantial increase in reported use, comfort, and diversity of tools and tasks. Students in 2025 were more likely to describe generative artificial intelligence as a normal and useful part of study, particularly for writing support, information gathering, and research workflow assistance. However, concerns about academic integrity, reliability, privacy, bias, environmental impacts, and the erosion of foundational skills remained evident. These findings suggest a shift toward stronger behavioral intention driven by more favourable attitudes, greater perceived behavioral control, and changing subjective norms around acceptable use. The discussion positions Pragmatic Acceptance as a new theoretical construct explaining post-adoption artificial intelligence behaviour in universities.

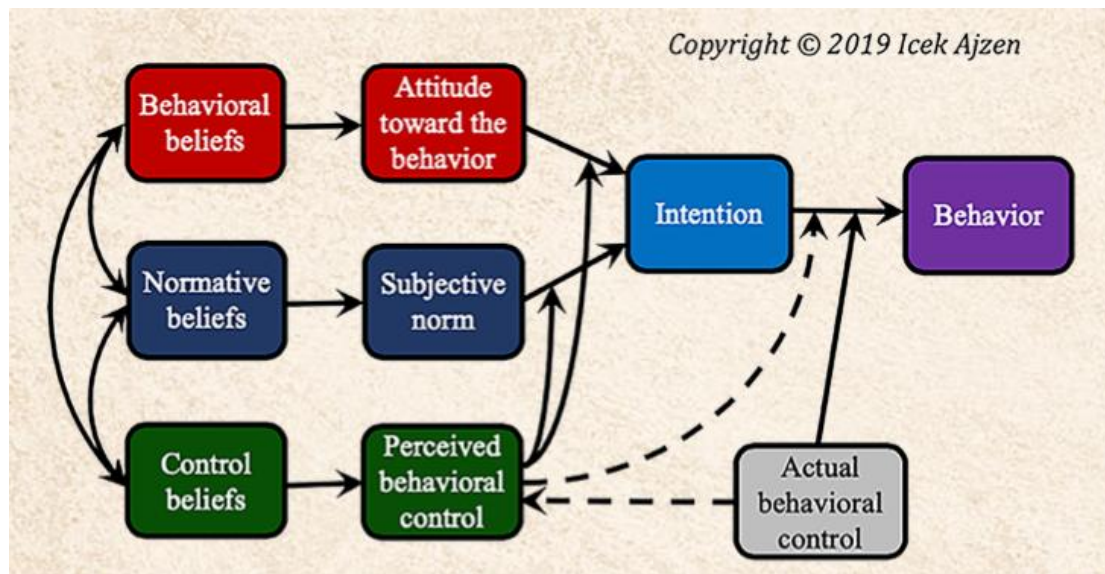
Keywords: *Artificial Intelligence, Generative Artificial Intelligence, Higher Education, Learning and Teaching, Theory of Planned Behavior, Pragmatic Acceptance.*

1. Introduction

The adoption and use of Artificial Intelligence (AI) in Higher Education (HE) has been strongly influenced in recent years by two major developments: an increased focus on virtual learning triggered by COVID-19 (Nawaz et al., 2020), and the widespread use of Generative AI (GenAI) following the release of OpenAI's ChatGPT 3.5 in November 2022 (Al Dhaen et al., 2022; Bearman et al., 2023). The dynamic developments and current uncertain and unsettled nature of GenAI are reflected in recent studies showing that educators' and students' perceptions of the use of AI in HE are far from homogenous, with much ambiguity, ambivalence, contradictions and tensions being reported (Alonso-Muñoz & Casero-Ripollés, 2026; Fawns, et al., 2024; Kim et al., 2025; Lee et al., 2024). While potential benefits for educators and students are acknowledged, there are also substantial concerns, especially around academic integrity, how AI tools increase the ease of cheating for students (Chung et al., 2024; Dai, et al., 2026; Fawns et al., 2024; Shoja et al., 2023), and assurance of learning (Crawford et al., 2026; Logan-Fleming et al., 2025).

Framing these developments through behavioral theory provides a useful lens for understanding why students adopt, or resist, GenAI tools in HE. Ajzen's Theory of Planned Behavior (TPB) proposes that behavior is most proximally shaped by behavioral intention, which in turn is influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). By adopting Ajzen's theory to frame the investigation of GenAI use by HE students, this study builds on recent work by Ivanov et al. (2024), Wang et al. (2025), and Al-Emran et al. (2025). Figure 1 shows the constructs of Ajzen's theory.

Figure 1



(Ajzen, 2019, by permission)

In the context of GenAI, students' evaluations of academic and learning benefits versus risks, including integrity, reliability, and skill erosion, can be understood as shaping attitudes. Perceptions of what peers, teaching staff, and the university approve can be understood as subjective norms. Access, capability, and confidence in using GenAI appropriately can be understood as perceived behavioral control. TPB provides a framework for examining how intentions to use GenAI may strengthen or weaken over time as tools, norms, and institutional guidance evolve.

Students' motivations for using AI can be understood as reflecting attitudes toward the behaviour, while their levels of comfort with AI point to perceived behavioral control. Together, these factors help explain variation in behavioral intention. Likewise, institutional guidance, staff expectations, and opportunities for AI literacy development can be viewed as facilitating conditions and social influences that shape patterns of use over time. This study, therefore, examined changing student attitudes and usage not only as a response to rapid tool evolution, but as an acceptance process unfolding within an evolving socio-educational context.

1.1. Background

There are numerous opportunities, and implicit motivations, for students to enhance their learning experience through AI adoption. Benefits include students' abilities to seek more effective feedback on their work (Crawford et al., 2023; Henderson et al., 2025), enhanced productivity and personalised learning (Chan & Lee, 2023), and the simplification of the learning process with less distraction and improved flow (Dong, 2026; Qi et al., 2026). Students can benefit from more innovative and authentic assessment designed with AI support, including self-assessments (Liebenow et al., 2025; Nieminen et al., 2025; Portuguese-Castro & Castillo-Martínez, 2026; Yang, 2026). AI can act as a writing assistant, helping with ideas and inspiration, and providing practical writing support in editing, language and citation techniques (Chan & Hu, 2023). Non-native speakers have found support to improve their written language skills (Sumakul et al., 2022; Tran, 2024).

Student views on AI are predominantly, but not uniformly, positive. Chen et al.'s (2023) study looking at the use of chatbots as teaching assistants showed positive perceptions regarding the ease of use and quality of the tool. Greater familiarity with GenAI seems to foster more positive attitudes (Sun & Zhou, 2025; Wu & Carroll, 2026). The prospective implementation of AI in workplaces raises other concerns, including work health and safety issues (Cebulla et al., 2023). Scheetz et al. (2021) surveyed clinicians about the use of AI in specific medical fields and identified education as the top priority to prepare them for the implementation of AI within healthcare.

International students make up a substantial proportion of the student population in Australian universities. They face additional challenges which may impact their academic success including undertaking assessment tasks, participating in group work and discussions, and keeping pace with content delivery (Lin & Guo, 2025; Wang et al., 2023). AI powered

translator and writing tools, voice recognition, dictation tools and language learning tools, may positively support the learning experiences of international students (Albedah, 2025; Hysaj et al., 2025). Tomlins (2026, p.142) states that critical thinking skills can be extra challenging for international students as such skills are a social practice “embedded in Western cultural norms, largely inaccessible and possibly unlearnable to those with a non-Western upbringing”. Rahman and Watanobe (2023) claim that a heavy reliance on GenAI tools such as ChatGPT can negatively affect critical thinking and problem-solving skills due to the ease of obtaining answers, problem-solving strategies and text generation.

While themes of learning enhancement, writing support, positive perceptions, familiarity, workplace implications, support for international students, and concerns about critical thinking and overreliance have been explored, there is little research regarding how attitudes have evolved over recent years. Given the importance of learning and academic integrity, and the influence of AI on both, it is necessary to understand the drivers of student intentions and behavior. This study examined the use of GenAI among students attending an Australian university during the 2023 academic year, and again in 2025. The study addresses the research question: How have university student intentions and behaviors towards GenAI changed between 2023 and 2025?

2. Methods

This study employed online surveys to investigate the perceptions of students regarding their experiences with GenAI. The first survey was conducted between June and August 2023, and the second between May and September 2025. The survey questions were developed through reviewing literature, and discussions among the research team. Quantitative questions featured discrete answer options with Likert scales and drop-down options that explored the following:

- Types of GenAI tools students utilized,
- How often students used GenAI,
- How students used GenAI to support their studies,
- Perceived comfort levels in using GenAI for their studies,
- Perceived comfort levels in using GenAI in the workplace after graduation,
- Perceptions of the use of GenAI for learning, assessment and feedback, and
- Perceived concerns related to GenAI.

There were also open-ended questions to explore students' perceptions of the use of GenAI in core skills in writing, critical thinking, and research. Demographic data included year level, age, gender, student status (international or domestic), faculty (discipline area), and enrolment status (full or part time).

Convenience sampling was used to recruit participants. Participation was voluntary and responses were anonymous. Responses to the quantitative questions were analysed via SPSS. Data from each year were analysed separately, then a second analysis focused on differences and similarities between time points using chi-square tests with $p < 0.05$ required for significance. Responses to the open-ended survey questions were analysed using inductive thematic analysis following the 6-stage process prescribed by Braun & Clarke (2022). Themes were then analysed using recurrent cross-sectional analysis (Grossoehme & Lipstein, 2016; Saldaña, 2003).

Members of the research team generated codes from the qualitative data and met regularly to confirm reliability. Coded data extracts were sorted by metadata categories including participant gender, enrolment status, and faculty. This process enabled exploration of potential differences between student groups. The lead researcher then conducted the recurrent cross-sectional analysis.

3. Results

In 2023, 353 students completed the survey. Of these, 152 (43%) identified as being from the Faculty of Health and Medical Sciences, 158 (45%) from the Faculty of Arts, Business, Law and Economics, and 43 (12%) from other areas/unidentified. First-year students (65%) represented the largest sector of participants with 12% in second year, and 21% third year. The average respondent age was 20.7 years. 180 respondents self-identified as female (51%), 168 as male (48%), and five respondents selected other options. Domestic students represented 65% of participants. Most participants (96%) indicated they were full-time students.

In 2025 there were 258 respondents. Of these, 115 (45%) identified as being from the Faculty of Health and Medical Sciences, 82 (32%) from the Faculty of Arts, Business, Law and Economics and 60 (23%) from other areas/unidentified. First-year students (61%) represented the largest participant sector with 23% in second year, and 9% in third year. The average respondent age was 20.4 years. 152 respondents self-identified as female (59%), 98 as male (38%), and five respondents selected other options. Domestic students represented 70% of participants. Most participants (95%) were full-time students.

3.1. Quantitative Data

Survey results are shown in Table 1. The first row against each question is 2023 data, the second row is 2025 data. Significance was calculated using chi square tests within and between years. Where significant within a year's cohort, this is marked as g (gender), s (student status, international or domestic), e (enrolment status, full or part time), f (faculty), a (age), and l (level of study). An asterisk (*) indicates significant difference between years.

Table 1*Survey results*

Question	n	Mean	Standard deviation	Significant differences
How often are you using Generative AI-based tools such as ChatGPT to support your university studies? (1= very infrequently, 5= very frequently)	353 258	2.42 3.30*	1.232 1.059	g g,s
How comfortable are you using Generative AI-based tools to support your university studies? (1=very uncomfortable, 5= very comfortable)	353 256	3.11 3.47*	1.152 1.059	none g,s
How comfortable would you feel using Generative AI-based tools to support your work after graduating? (1=very uncomfortable, 5= very comfortable)	353 258	3.25 3.24	1.132 1.086	none g,s
To what extent do you believe Generative AI-based tools can enhance your learning experience at university? (1=strongly disbelieve, 5= strongly believe)	353 255	3.6 3.79	1.067 0.968	f,s,g none
To what extent do you believe Generative AI-based tools can enhance your ability to pass assessments at university? (1=strongly disbelieve, 5= strongly believe)	352 256	3.25 3.39	1.012 1.012	s, g none
Would you give the same value to AI generated feedback on your assignments as you would to human generated feedback?	351 257	1.42 1.32	0.594 0.521	s, f s, e, a
To what extent do you feel that Generative AI-based tools are as reliable as Academic Staff regarding discipline knowledge? (1= significantly less reliable, 5 = significantly more reliable)	352 258	2.01 1.93	0.953 0.912	s s, a
Number of different types of tasks AI is used for	292	2.59	1.82	none
	219	3.50*	2.06	none
Number of different AI tools used	346	1.67	0.965	f
	257	2.01*	1.146	l
Number of resources accessed regarding use of AI	274	1.60	0.852	l
	219	1.89*	0.921	none
I am concerned that AI-based tools collect and store large amounts of data, including personal information/University intellectual property and student information (1=very unconcerned, 5=very concerned)	350	2.97	1.166	g, l,
	258	3.13	1.193	e
Do you have any concerns about the implications of using Generative AI in higher education, such as issues related to privacy, bias, ethics, or discrimination? (Yes=1/No=0)	351	0.29	0.453	none
	256	0.34*	0.476	s
Do you think the increasing use of Generative AI as a feature of your future profession will impact the future of work and employment in your industry?	346	2.86	0.857	g, f, l
	258	2.89	0.803	f, e, a

In 2023, 68% of surveyed students reported having used some type of GenAI tools.

Only 25.8% of respondents used AI tools weekly or daily, and nearly one-third of students surveyed indicated they had not used any GenAI tools. By 2025, 92% of surveyed students reported having used some type of GenAI tools, an increase of 24%. Weekly use had

increased to 43% of respondents and daily use to 8.5% (Figure 2). Females were less likely to be frequent users (Figure 3).

Figure 2

Frequency of student use of GenAI

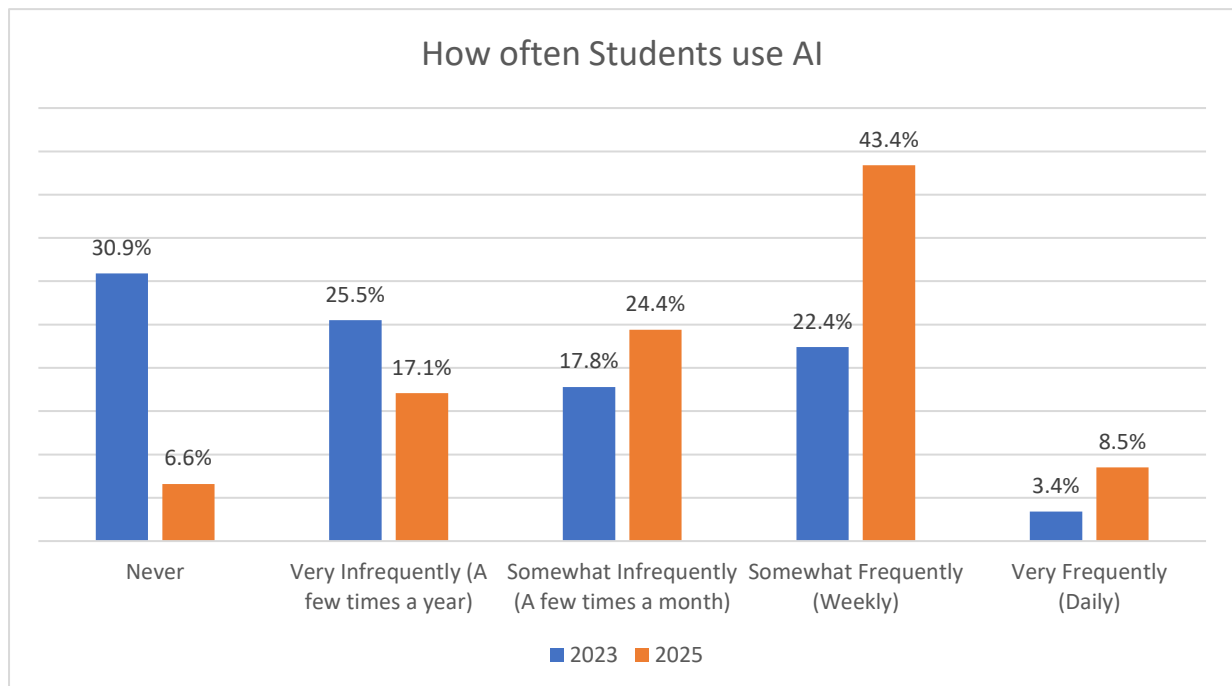
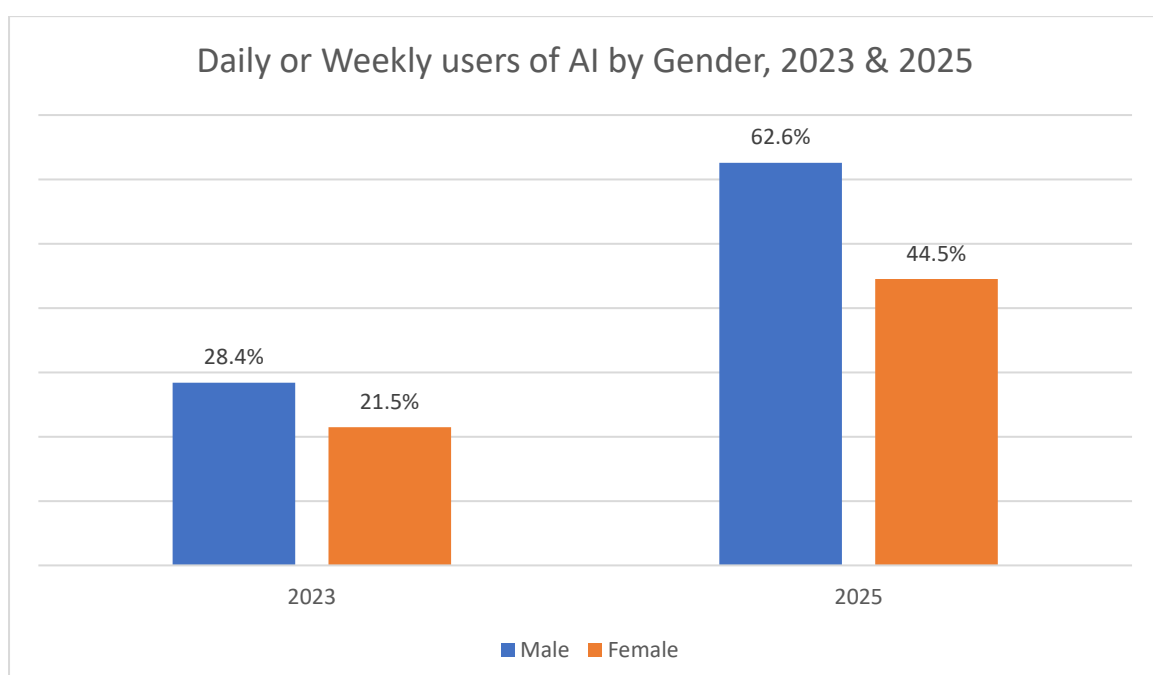


Figure 3

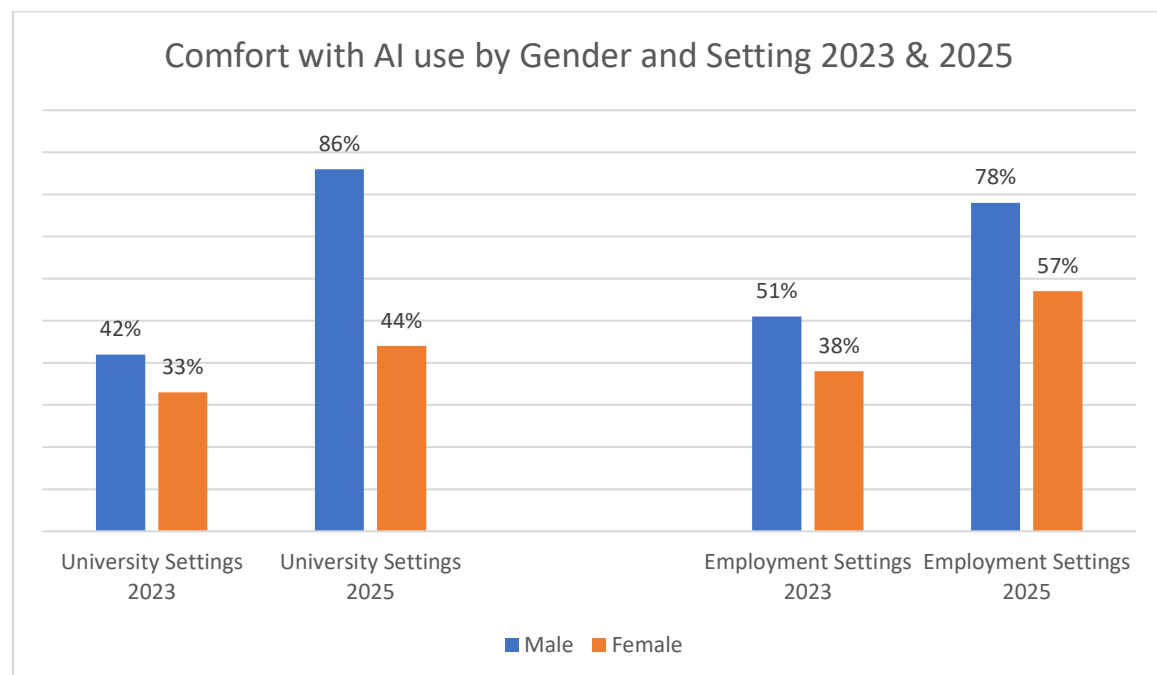
Daily or weekly use of AI by gender 2023 and 2025



Students were asked how comfortable they would feel using GenAI tools for their studies as well as in a work environment after graduation. In both cases there were no significant differences between groups in 2023 except based on gender (Figure 4). The proportion of respondents who felt somewhat or very comfortable using GenAI for their studies was 37% in 2023. This increased to 77% by 2025. In 2023, a majority of respondents (68%) indicated an expectation that GenAI tools would have impact on employment in their future professions. That figure increased to 72% by 2025.

Figure 4

Comfort with AI use by Gender and Setting



When it came to learning activities and AI use, the data showed no significant differences between years. Overall, 60% of respondents in 2023 and 67% in 2025 stated that they believed or strongly believed that GenAI tools could enhance their learning experience at university. Students were also positive that AI could enhance their ability to

pass assessments with a non-significant downward trend over time (67% in 2023, and 50% in 2025).

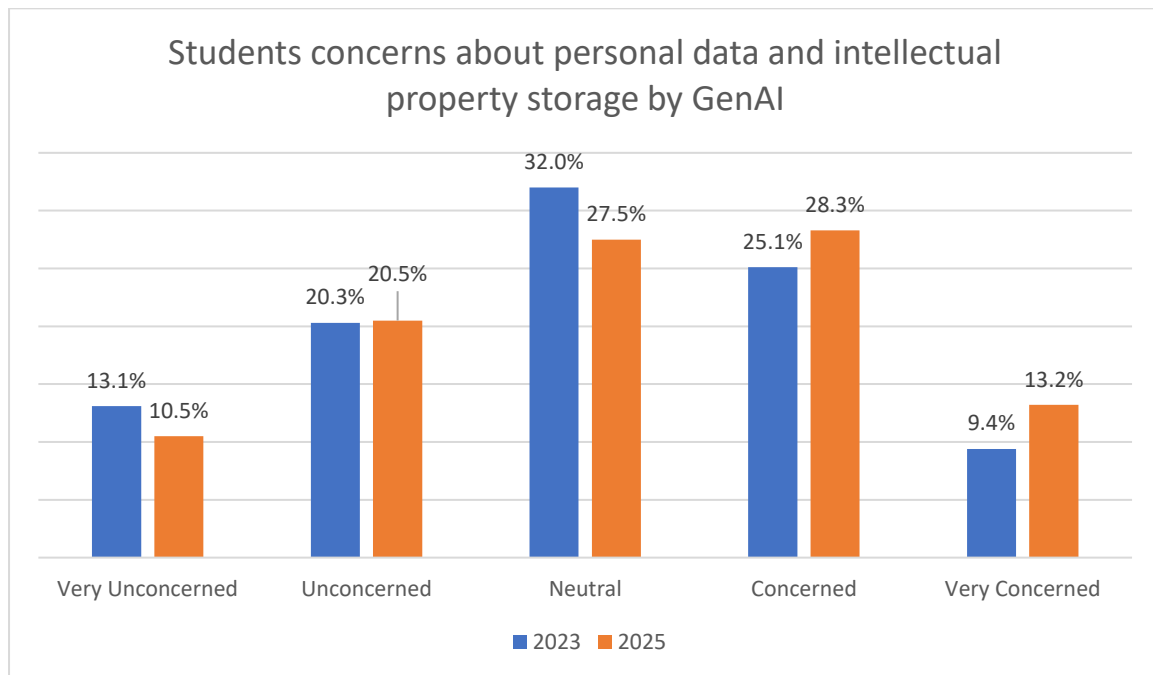
A minority of students in 2023 (37%) indicated that they would give similar value, or even higher, to assignment feedback generated by AI tools in comparison to feedback by humans. This reduced to 29% by 2025. A significantly larger share of international students than domestic students expressed this view (47% vs 32% in 2023, and 40% vs 28% in 2025). This is consistent with Wang et al. (2023), who suggest AI may be particularly attractive to international students because it offers immediate, language-sensitive, low-barrier support.

Students' perceptions of discipline knowledge produced by GenAI tools in comparison to humans were similar. Overall, 26% of respondents in 2023 and 21% in 2025 considered AI tools to have the same, or higher, reliability as academic staff. The proportion of international students giving the same or a higher reliability to AI tools was substantially higher than the share of domestic students (40% vs 18%) in 2023. This figure equalised in 2025 (24% vs 23%). A quarter (25%) of students in 2023 who reported no usage of AI expressed a belief that these tools would enhance their ability to pass assessments. By 2025 this had increased to 32%. In 2023, those reporting no AI use believed AI could enhance their university experience (32%), however, by 2025 this had reduced to 26%.

Although concern about ethics, bias, or discrimination increased significantly between 2023 and 2025 (29% to 34%), the majority of students remained neutral or unconcerned in both years (65% and 59%). International students in 2025 reported significantly lower levels of concern than domestic students (mean 3.39 vs. 3.24). A comparable, though less pronounced, pattern of low concern was observed regarding the storage of personal data and intellectual property by GenAI tools (Figure 5), with such concerns rising modestly by 2025.

Figure 5

Student concerns

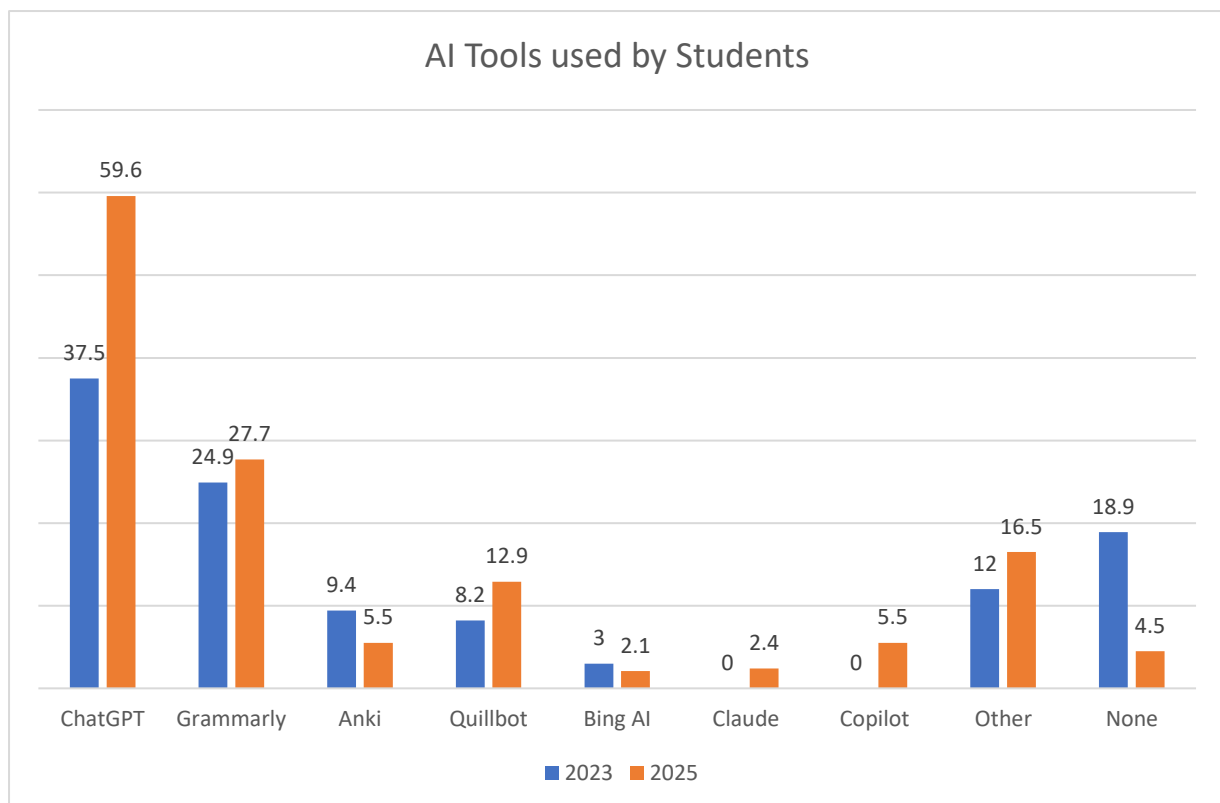


The overlap between the two types of concerns is somewhat limited, with a Pearson's correlation of 0.318 ($p < 0.001$). Student beliefs about the impact of AI in their workplace varied by faculty, but was mostly perceived as neutral.

While ChatGPT remained the predominant tool among students (Figure 6), the findings revealed a diverse range of AI software in use, including image-generating applications. Notably, between 2023 and 2025, significant increases were observed across the number of tools utilised, the resources consulted to support their use, and the breadth of tasks to which GenAI was applied.

Figure 6

GenAI tools being used by students (% of participants)



Students were asked to identify the tasks for which they typically used AI (Figure 7).

The most common task in both cohorts was clarifying course content. Other common responses from both cohorts included checking grammar, finding resources, and conducting or creating practice tests. They also identified resources regarding GenAI which had been provided by their university and which they were aware of or had already accessed (Figure 8). Nearly 50% of students indicated use of at least one of the university-wide resources, typically webpages on academic integrity. Approximately one third of students in 2023 indicated there had been discussions in class, demonstrating teaching staff had engaged with the relevance of AI for their teaching by mid-2023.

Figure 7

Student use of GenAI (% of participants)

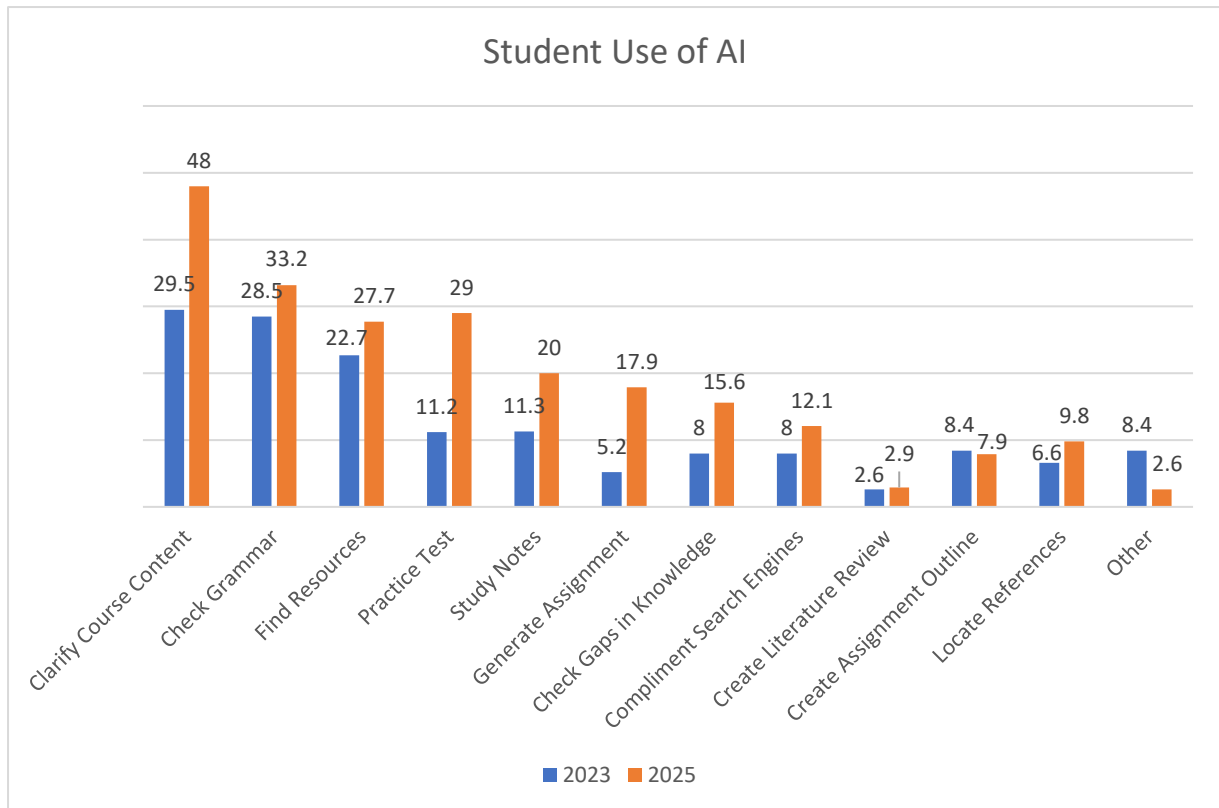
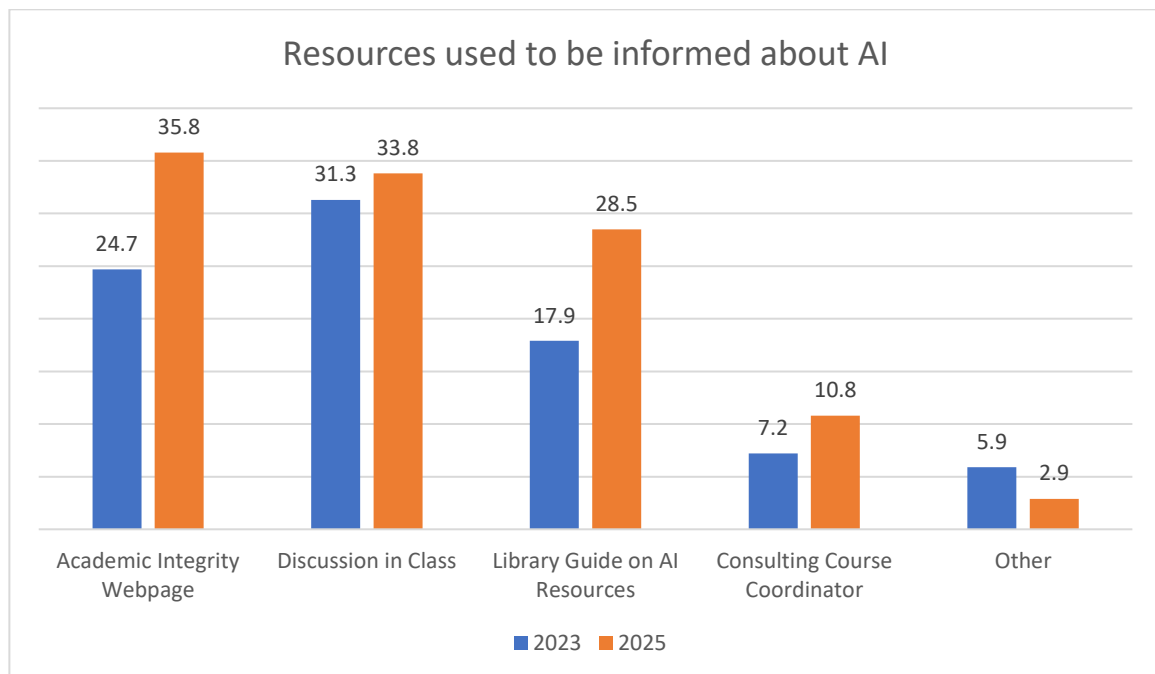


Figure 8

Resources used to be informed about GenAI (% of participants)



3.2. Qualitative Data

Themes in the written responses to the open questions at the end of the surveys differed between 2023 and 2025 cohorts, yet were similar across those who used GenAI and those who had yet not used GenAI. Prominent themes in both years' datasets were: Privacy and Intellectual Property, Bias and Ethics, and Student Authorship/Academic integrity/Authenticity. Students in 2023 raised concerns regarding gaining academic advantage and devaluing the degree. However, each of these concerns were mentioned only once in 2025. Students from both cohorts also expressed concerns related to discrimination in how GenAI may be used by some students in contrast to others to gain unfair academic advantage over non-users:

From 2023: "Not everyone is confident using the technology, and use of the technology isn't taught, so it disproportionately advantages those who are 'tech savvy'",

"The use of chat GPT allows students to have a written assignment within minutes due to the intellectual advancements of technology these students will receive a higher grade. Whilst other students put in effort and write their own assignment but could receive an average grade", and from 2025:

"unfair for other students who do the right thing".

Students expressed concerns that overreliance on AI during coursework could negatively impact their qualifications and workplace knowledge:

"it gives students the ability to create and then pass assessments without doing the proper workload and going through the content, gives rise to less qualified practitioners", and from 2025:

“when they complete the University degree and graduate as they may not be qualified to practice”,

“an individual heavily relying on AI to pass their classes aren't as qualified and less trustworthy for their job”.

3.2.1. Privacy and Intellectual Property

Students expressed concerns regarding personal information being misused, and mass data collection, including data collection from student's own work which may be reused by AI for other users:

“AI might somehow hack into your personal information, and you wouldn't know what it will use it for”,

“Mass data collection without consent or accountability is something I am concerned about”, and from 2025:

“I personally think of the implications that AI can have in higher education such as privacy concerns where my data could be shared”.

Students were concerned that AI may pose issues around authorship and academic integrity:

“when used to generate content for essays/assignments, as I feel this is not a person's own work”, and from 2025:

“Can often be used to generate assignments, rather than generating ideas - breach of ethics and academic integrity.”

Students were aware of the limitations of GenAI, such as the possibility of receiving unreliable or factually incorrect information:

“AI may not provide the best answer all the time and is fundamentally flawed”,

“AI can create fake studies and statistics to support its own claims, this can lead to incorrect information being passed around”, and from 2025:

“knowledge derived and learnt from AI may be unreliable”.

3.2.2. Subthemes

Many students held a positive view that GenAI can be, or is being, used to support the development of their writing, critical thinking and learning skills. Subthemes for writing skills included: Corrective feedback (grammar, spelling, punctuation), Structuring, and Generating ideas. Students who used Large Language Models (LLMs) perceived that GenAI tools developed their writing skills by using it for ‘Corrective feedback’:

“used to correct the grammar, turn the language of English as second language learner more native”,

“GenAI will have the ability to fix spelling, grammar, and punctuation in order to make your writing more fluent and free-flowing so there aren't any silly spelling mistakes”, and from 2025:

“AI can be used to provide instant feedback on the user's writing, such as grammar feedback, vocabulary suggestions which can be utilised to enhance writing skills.”

Students from 2023 who had indicated they did not use any AI tools did perceive that GenAI tools could help their writing skills by providing corrective feedback. However, by 2025 there was increasing skepticism and rejection of AI as tool to assist in developing writing skills:

“It does not develop writing skills, it solves issues. Correcting poor writing is not teaching you anything”, and

“It doesn't develop writing skills, it helps you avoid learning writing skills while maintaining a facade of competence, forcing over reliance on the tool”.

Students from 2023 stated that GenAI tools can assist in developing critical thinking skills by generating ideas and collecting information:

“It assists with ideas in which you can then use your own thinking to expand on allowing space for critical thinking”, and

“brainstorming multiple ideas at once and providing even more ideas that you may not have thought of”.

Students also claimed it can help with building critical thinking & analytic skills:

“When we use Generative AI, we have to always consider that it's not always 100% accurate, and we need to actively consider what we know about the topic... This requires critical thinking and judgement making skills”, and
“individuals can explore ethical considerations such as data privacy, algorithmic bias, transparency, and the responsible use of AI technology”.

By 2025 there were more detailed and nuanced responses regarding critical thinking skills:

“Comparative analysis, such as weighing different viewpoints”,
“Provides a sequence of research”, and
“AI can easily provide the user with multiple perspectives on one single topic, which can prompt the user to critically think in ways they might not have before”.

Students who had indicated they did not use any AI tools also perceived that GenAI tools could assist their critical thinking skills by generating ideas and building analytic skills. There were many students from both cohorts who were skeptical of AI's ability to improve critical thinking skills:

“it doesn't lol”,

“Generative AI could reduce critical thinking rather than assist”,

“it is just another short cut that people can use instead of actually thinking for themselves”, and from 2025:

“Impossible. It solves it for you, no critical thinking is needed”,

“I think excessive use of AI actually erodes critical thinking skills”.

Across both surveys, respondents most commonly saw AI as a way to speed up finding and processing information. Compared with 2023, the 2025 responses showed a more developed information literacy, including more explicit attention to peer-reviewed/credible sources, verification/cross-referencing, and using AI alongside scholarly databases. The 2025 cohort continued concerns about overreliance and fabricated citations. Students reported that AI-powered tools can enhance their research skills by helping with finding and retrieving sources and references:

“Can create preliminary list of journal articles to begin researching a topic and be based on publication date”,

“AI tools can help me find the source of information for my research”, and

“Can provide different sources that may have been difficult to access just from searching the internet”.

GenAI tools were also perceived as useful in aiding students find a starting point for their research task and for information gathering:

“It provides users with starting points for research questions, which can then prompt further thinking and further research, therefore cutting out the beginning hours of research.”

A common concept was the use of GenAI tools to manage research tasks, allowing for instant access, time-saving retrieval and reading of information:

“Immediate access to large amounts of relevant information”,
“can pool a range of information together from the internet within seconds”, and
“It can aid in speeding up the process of completing things such as a systematic review, and writing up your own study”.

These data demonstrate that students are aware of how GenAI can support skill development in writing, critical thinking and learning.

Key thematic differences between the 2023 and 2025 respondents included a move from search shortcut to research workflow support. 2023 respondents often framed AI as Google-like discovery, 2025 more often described end-to-end support:

“synthesises and evaluates information faster from larger databases”, and
“assist with finding sources and generating reference lists”.

Examples of stronger information-literacy language in 2025 include more explicit talk of peer review: “can provide peer reviewed sources”, credibility/quality appraisal: “it could assist in finding well-documented and highly credible research”, corroboration/fact checking: “source evaluation and fact checking”, and checking quotes/claims: “each quote should be checked”. There was no observable pattern in the demographics between those students who expressed belief in the ability of AI to support skill development and those who expressed these concerns.

Themes more prominent in 2023 include AI hallucinations, uncertainty of AI’s capabilities, and the novelty factor of AI:

“haven’t used it”,
“don’t know enough”, and

“a lot of people seem to think it's funny”.

The 2023 cohort expressed a need for policies and guidelines as the main institutional task as they were concerned about the university defining what counts as acceptable vs misconduct indicating a need for guidance including calls for clearer rules, boundaries, and education on appropriate use. The 2023 cohort also seemed more optimistic using values-based tone in some responses, expressing AI as “powerful”, and “supports learning”. There was only one specific mention in 2025 about fabrication or hallucination of citations: “tends to fake websites, authors, articles”.

Responses from 2025 indicated a greater sense of normalization and ubiquity. There were more comments implying AI is now hard to avoid and widely used:

“everyone uses it”,

“can’t not use it”, and

“here to stay”.

There was a stronger focus on dependency and skill erosion with repeated concern that reliance reduces foundational knowledge, critical thinking, and independent skill development. The 2025 cohort also discussed environmental concerns:

“I think it should be banned. The educational implications (let alone the environmental ones) are too concerning”.

Furthermore, the 2025 cohort included more discipline specific risk-framing raising concerns about AI use in medicine/psychology/vets/doctors and the consequences in high-stakes occupations.

3.2.3. Pragmatic Acceptance

Respondents in 2025 acknowledged the co-existence of justifying shortcut use due to workload and stress, while continuing to maintain a continued awareness of risks. One

respondent stated AI “could be used positively” to generate ideas and critique articles. However, they also stated “AI can definitely be abused”, suggesting if humans do not take the important steps in their research processes “AI can be unproductive and harmful to learning and development of skills”. Another 2025 respondent suggested: “AI can provide different perspective on things which can cause the user to think in a different way than they would normally”. However, they state that “prolonged reliance on AI has the ability to result in the regressing critical thinking skills if used as a shortcut rather than a guidance tool”.

Justification of shortcut use includes terms and phrases like “save time”, “without much effort”, “significantly increase the speed of research”, and “simplify”. These all confirm the pragmatic role students see AI performing in their learning processes. Phrases and terms demonstrating students’ acceptance of AI in 2025 include:

“understanding on AI is needed”,

“become such a common thing that university should address that using AI is normal and is acceptable”, and

“AI overviews every time you search something on the internet”.

Responses from 2025 participants exhibiting AI inevitability include:

“becoming something that students can’t not use”,

GenAI “definitely has a place... including within an academic context”, and

GenAI “in academia and professional work is inevitable”.

There was also a sense of long-term inevitability:

“Generative AI is here to stay”, and

“Gen AI is the future”.

Some 2025 participants indicated a sense of reluctant acceptance stating:

“Whilst I am strongly against AI due to its unethical and climate destructive behavior, I do believe that when used properly it can be a useful tool for individuals that struggle with structuring and writing”, and
“It is hard to avoid in the modern world, so embracing it in small amounts can be good, but I believe it is too engrained into everyday use and is detrimental to an extent”.

Another respondent offered some pragmatic advice:

“If you do not control and carefully monitor your own AI use, it can easily become addictive”.

A reaction to this sense of pragmatic acceptance is students acknowledging that universities need to teach AI skills. One 2025 respondent stated they want, in every discipline, for AI skills to be taught “in a way that AI is more a tool” than a replacement for humans. Other suggestions from 2025 respondents include:

“Universities should... teach AI literacy alongside academic integrity”,

“university should address that using AI is normal and is acceptable”, and

“teach us to use AI to develop critical thinking skills”.

However, pragmatic acceptance was not ubiquitous, there were some 2025 respondents who did not agree:

“I'm paying for a university education, not to be told to teach myself using a free AI on the internet”,

“writing as an art is subjective and... AI will struggle with understanding and actually being helpful”, and

“I can't think of an example where AI would actually help...people shouldn't use it”.

4. Discussion

This study asked: How have university student intentions and behaviors towards GenAI changed between 2023 and 2025? The survey results seem to indicate a shift toward more normalised and pragmatic engagement with GenAI by 2025. Compared with 2023, students more frequently described GenAI as an embedded part of academic workflow while still expressing persistent concerns about academic integrity, reliability, privacy, environmental issues, and potential erosion of foundational skills. The 2025 cohort demonstrated an increase in positive attitudes to behavior in parallel to greater nuance in normative and control beliefs, supporting the interpretation of a developing, but qualified, acceptance rather than a uniform pro-AI or anti-AI stance. However, this shift may not be explained by changing attitudes and norms alone. Al-Emran et al. (2025) show that students' GenAI use is also shaped by task–technology fit, suggesting that uptake increases when students perceive these tools as well aligned with specific demands of academic work such as writing, research, and problem solving. In the current study, the move from occasional experimentation in 2023 to more integrated workflow use in 2025 is consistent with this interpretation. Improved nuance and understanding of normative and control beliefs may also be a product of an extra two years of broader society's experience of, and discourse around, GenAI and the resulting development in associated language.

Themes observed in the data align with core propositions of Ajzen's (1991) Theory of Planned Behavior: Students' reports of time-saving, productivity gains, and support for writing and research point to increasingly favourable attitudes toward GenAI use, while persistent concerns about academic integrity, reliability, privacy, and skill erosion highlight conditions under which those attitudes become less favourable. The prominence of AI familiarity, growing comfort, and requests for AI literacy training speak to perceived

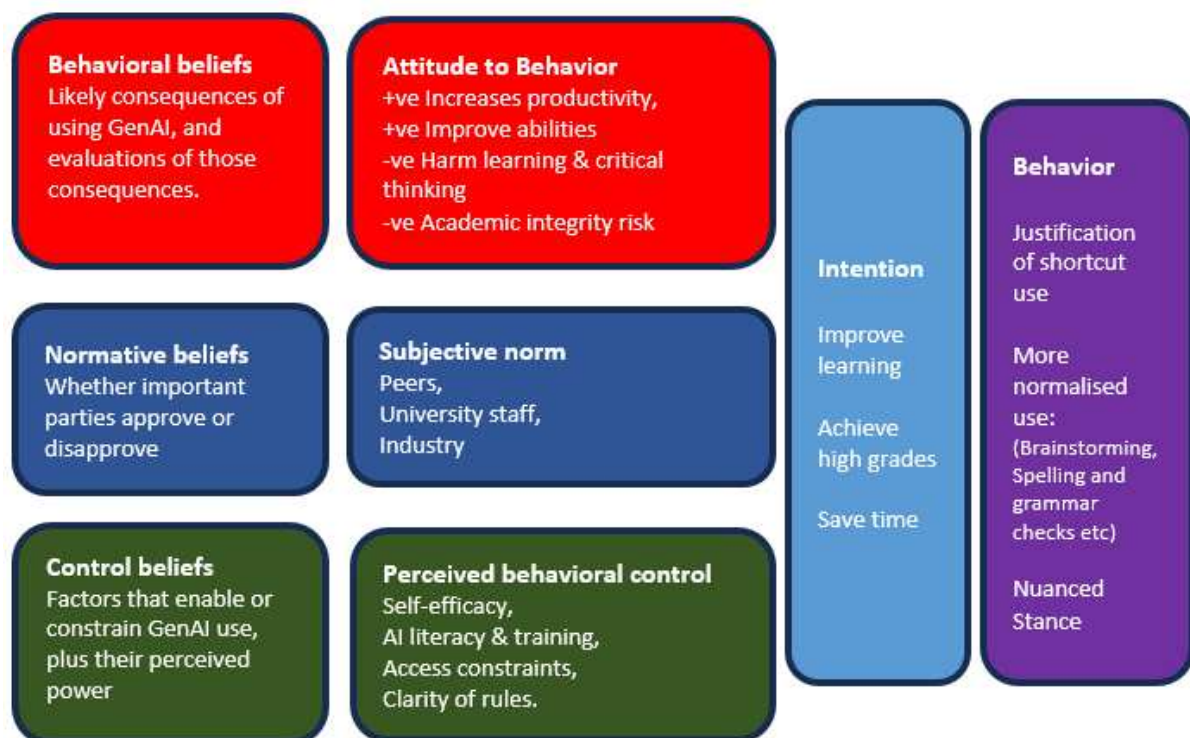
behavioral control. Students are more likely to intend to use GenAI when they feel capable of using it competently and appropriately. From the perspective of Ajzen's TPB, these expectations can be read as shaping students' attitudes toward GenAI-enabled work and, importantly, their perceived behavioral control, the extent to which they feel able to use GenAI effectively and comfortably in university and future professional contexts.

References to class discussions, staff expectations, and institutional guidance underscore the role of subjective norms in shaping what students perceive as acceptable or expected. Findings suggest that the increasing normalisation of GenAI in HE is best understood as an evolving configuration of attitudes, norms, and perceived control that strengthens (or constrains) behavioral intentions and, in turn, patterns of uptake, over time.

Figure 9 illustrates how the findings map onto Ajzen's TPB framework.

Figure 9

Graphical depiction of student AI use in TPB



Survey data revealed both a significant awareness of GenAI tools across a range of

academic tasks and a discernible shift in behavioral intent, notwithstanding external constraints. Notably, students who identified as being more familiar with technology were more likely to utilise AI tools frequently, consistent with TPB in which higher perceived behavioral control and digital self-efficacy predicts stronger uptake, in keeping with Wu and Carroll's (2026) similar finding. Disparities in participant responses highlight a critical divide in student experiences and perceptions, suggesting that while many students embrace advantages of AI for efficiency and support, others remain cautious about implications for their academic development and integrity.

Furthermore, the analysis of demographic data revealed few significant patterns in the responses regarding perceived benefits and drawbacks of AI tools, suggesting that concerns about critical thinking and research skills remain widespread across different student groups. Where differences did exist between groups they were relatively minor.

In 2023, a large proportion of respondents reported never, or very infrequent use, and expressed neutral to uncomfortable levels of comfort. By contrast, the 2025 data show a redistribution toward more regular use, particularly weekly and daily engagement, accompanied by higher reported comfort. This is consistent with TPB in that more favourable attitudes toward GenAI use, and stronger perceived behavioral control come from greater confidence and comfort in use and are associated with stronger behavioral intentions and, consequently, more regular engagement. This supports findings from earlier research (Ivanov et al 2025; Wang et al., 2025) which showed that comfort, familiarity, and regular use rise together, which maps neatly onto perceived behavioral control and attitude formation.

The student survey responses for the different AI use tasks points towards types of activities, such as finding information outside of the classroom, generating practice test

items for study, and locating references, where LLM tools might provide a viable substitute for more specialized tools. Among respondents who identified as Large Language Model (LLM) users, almost all (98% in 2023 and 99% in 2025) used these tools for university purposes. The listed non-LLM tools had integrated AI aspects into their services including Microsoft Word's grammar check, and tools like Grammarly and StudioCity. It is therefore likely that students who report no university usage of GenAI tools either were not aware of such AI integration within those tools or only made use of a non-AI subset of tool functions.

It is important to further understand why some students are not using GenAI tools and are not comfortable with using GenAI tools for study and in their future work. Non-use and discomfort can be understood as reflecting weaker behavioral intention driven by behavioral and control beliefs, and high perceived risk. In 2023 students may have been less aware of the benefits of the various GenAI tools. Additionally, the costs related to access full versions or premium versions of GenAI tools are magnified if multiple tools are engaged. Student use of AI has increased, and the 2025 data indicates greater behavioral intent, and acceptance. Proposed drivers of motivation to engage with AI are similar to other studies, including the stresses of university study (Crawford et al., 2023), ready availability, and potential time saving (Chan & Hu, 2023).

These findings also extend acceptance-based research. Strzelecki (2024) demonstrated the value of technology acceptance frameworks for explaining students' acceptance of ChatGPT in HE. The present findings suggest that such acceptance processes may not remain static as technologies become increasingly familiar. Rather, the recurrent cross-sectional data indicate that attitudes, comfort, perceived risks, and patterns of use can shift as GenAI moves from technological novelty toward a more normalised component of students' academic practices.

4.1. Types of GenAI tools being used by university students

This study's findings are similar to Walczak and Cellary (2023) who found 79% of their undergraduate and postgraduate cohort used ChatGPT. Their participants likewise demonstrated use of additional, tools including GitHub and CoPilot. In this study students commonly used GenAI tools to provide corrective feedback by checking grammar, spelling and punctuation. Students noted that GenAI tools assisted in their time management, managing their workloads by being able to access information 'instantaneously', or making light work of what would be hours of sourcing, reading and note taking, an aspect noted by Bissessar (2023). Furthermore, Chan and Lee (2023) found students intended to use GenAI for learning assistance, help with assignment content, and writing support. Their findings have been reconfirmed by the current study. Technical writing skills including essay structure and organization, grammatical checks, proof reading, and writing support for specific assignments, as well as other general support including improving arguments, were present in both of the current study's cohorts.

Previous studies have suggested AI-assisted language editing and translation skills may increase equity in education for students from non-English speaking backgrounds (Lin & Chang, 2024; Sharifuddin & Hashim, 2024). In the current study, regarding students with English as additional language, or additional learning needs, the use of AI to support the quality of their written work was prominent in 2023 including checking grammar, spelling and punctuation but decreased by 2025.

4.2. Critical thinking skills

A common graduate attribute among universities globally is being able to critically analyse and evaluate, problem solve and come up with creative solutions. This study

indicates that students perceive usefulness of GenAI tools in helping develop critical thinking skills by generating ideas and collecting information, then generating critical inquiry questions, and providing varying perspectives.

The 2025 cohort expressed a more developed understanding of usefulness by articulating more specific pathways through which GenAI could support critical thinking. Kemp et al. (2024) noted that experience can be a moderator of perceived usefulness and expectations. An increase in expectations between 2023 and 2025, suggests that greater exposure may have strengthened behavioral intent over time as students now have more experience with LLMs. However, some students still expressed that critical thinking skills would not be supported by GenAI tools, or it may diminish the development of critical thinking skills.

4.3. Student concerns regarding use of GenAI tools in HE

While students in this study indicated they were using GenAI tools and expressed a level of confidence and awareness of the positive capabilities of these tools to support their university studies, they were also aware of the various limitations and some expressed concerns about use of GenAI tools in a higher education setting. This supports the narrative generated by similar studies including Chan and Hu (2023) whose student participants expressed concerns regarding the accuracy and transparency of AI tools as well as privacy and ethical issues. Limna et al. (2023) observed privacy and storage of personal information concerns, and Firat (2023) noted these as well as social concerns and the potential for increased reliance on technology which may lead to reduced cognitive capacities. Students are concerned about the use of GenAI tools because they are aware of reports on social media about ‘dangers’ of GenAI and from information provided by teaching staff or the

University. The fears possessed by academic staff are projected onto students because teachers may be critical or concerned about students using GenAI.

Among the core and foundational skills for university students across all degrees and disciplines is the development of critical thinking and research skills. Students in this study perceived advantages of GenAI tools in helping expediate the process of locating information or references and assisting with providing basic outlines and structure when undertaking written tasks. However, students expressed concerns that if they become fully reliant on using GenAI tools to outsource these tasks, they will not develop essential critical thinking or research skills. This could have negative implications for their learning and future careers post-university.

These concerns by students are supported by other studies in the literature. Chan and Lee (2023) observed concerns regarding unethical, dishonest, and irresponsible use of GenAI in HE including cheating, plagiarism, copyright issues, and outputs being of low quality or misinformed or biased. Some participants in their study believe that GenAI would hinder or defeat the purpose of learning in the fields of language and writing itself.

4.4. Pragmatic Acceptance

The concept of Pragmatic Acceptance (PA), increasingly evident in the 2025 quantitative and qualitative data, helps explain how GenAI has shifted from a novel, contested tool in 2023 to an increasingly normalised feature of student study practices in 2025. This pragmatic acceptance is evidenced quantitatively by marked increases between 2023 and 2025 in students' frequency of GenAI use, reported comfort with using GenAI for their studies and future work, and overall perceived usefulness, alongside sustained, but not escalating, levels of concern regarding reliability, integrity, and data privacy. The greater increase of use over increased concern is a key quantitative indicator of the PA theme. This

pattern reflects strengthening expectations alongside ongoing constraints on behavioral intention arising from perceived risks and costs. Rather than expressing a simple dichotomous pro-or-anti stance, many 2025 respondents described an ongoing negotiation between these perceived performance gains and the conditions under which use remains acceptable.

The pragmatic framing also points to the importance of facilitating conditions and social influence. Students' calls for clearer boundaries, discipline-relevant guidance, and ethical norms indicate that institutional supports and expectations shape whether GenAI is taken up as a legitimate learning tool. Taken together, these accounts suggest that student attitudes are consolidating around conditional acceptance, where GenAI is increasingly viewed as appropriate when positioned as support for learning processes rather than a replacement for learning or authorship, reinforcing the need for institutions to respond with practical, discipline-relevant supports that lower effort barriers and enable responsible use.

Pragmatic acceptance is not simply a cognitive judgement about usefulness; it also reflects how students weigh GenAI concerns against their comfort as part of everyday study. From a TPB perspective, these judgements can be understood as contributing to students' attitudes toward using GenAI and their perceived behavioral control, which together shape behavioral intention (Ajzen, 1991). Kemp et al. (2024) similarly emphasise the relevance of comfort and wellbeing to students' technology-related intentions. Students' willingness to adopt GenAI may be strongest when its pragmatic benefits are achieved without compromising psychological comfort regarding academic honesty and environmental issues, workload manageability, or perceived learning integrity.

4.5. Support for students

Students had a generally positive attitude towards using GenAI tools and acknowledged the benefits they could gain from it. However, some students expressed concerns while others remain unsure about using GenAI. This points to the importance of strengthening perceived ease of use/effort expectancy and performance expectancy, understanding when and how GenAI can genuinely support learning, while also addressing perceived risks that may suppress behavioral intention. Students' continued requests for guidance on how to best utilise GenAI tools, can be understood as a call for stronger facilitating conditions and clearer social influence signals. At an institutional level, policies and practical resources are needed to support both students and staff in best-practice use of GenAI for learning, including preventing intentional and unintentional misuse, and helping students adopt GenAI in ways that support, rather than replace, skill development.

5. Limitations of the study

The participants in this study mostly represent undergraduate students with a bias in the sample toward first year students from two of three large faculties (Health & Medical Science; and Arts, Business, Law and Economics). However, there is an even balance of genders and an accurate representation of international and domestic students in-keeping with the university's total cohort (Studymove, 2024). Another limitation is that the data cannot confirm causes of differences between the cohorts. While it is reasonable to speculate that these reflect greater awareness and engagement with AI, the differences may equally be attributable to other factors.

Future studies could consider longer term follow-up of cohorts of students to find out how the use of GenAI changes during student progression through their degrees and also with research and post-graduate students. Further research could investigate barriers

to accessing GenAI for learners and if expectations regarding the need to use it leads directly to processes designed to ensure equity to access.

6. Implications for practice

Having insights into student attitudes and behaviors regarding the use of GenAI is crucial for future policy, curricula and assessment development. In this study, students indicated they want support to use GenAI appropriately and ethically. Student partnership in developing appropriate resources and skills would be important and should be discipline-specific and relevant to their future workplaces.

AI literacy is a skill that university students need to develop. Educators need to equip students to understand how GenAI works, how to use it effectively and ethically, and to distinguish the human skills needed from the AI skills. Academic staff also need support. Their attitudes, beliefs, and skills in GenAI tools, regarding how to incorporate them into their pedagogy, to design and set learning tasks, to draw out the positive benefits of GenAI tools, and to support all learners in inclusive education, needs to be well developed in accordance with institutional policies. Educator attitudes, beliefs, and skills in GenAI tools may affect student uptake of GenAI tools. It may scare them off or inadvertently make students use them inappropriately.

Chan and Lee (2023) observed that Generation X and Millennial academics have different comfort levels and experiences with GenAI technologies to those of Generation Z students. These groups require different forms of training and support to incorporate into their academic practice. Chan and Lee (2023) call for students and teachers to reskill to keep up with GenAI and its rapid expansion. They also mention that individuals, institutions and countries should not be left behind but also any protocols for GenAI adoption in HE should include fair access to all so there would not be digital poverty. This is especially concerning

when one regards the rapidly moving rate of development in GenAI and projections of future evolution. Cedeño-Salazar et al., (2025) states the digital divide is continuing to widen and advocate for ensuring inclusive education, which they claim will require a collective commitment between governments, educational institutions, relevant communities, and technology companies. For the foreseeable future, Universities will need to have teams ready to constantly update guidelines, policies, and resources for staff and students.

7. Conclusion

This study positions Pragmatic Acceptance as a new theoretical construct explaining post-adoption AI behaviour in universities. It is crucial for all stakeholders in HE to acknowledge the balance of opportunities and challenges associated with GenAI tools. As one insightful student reflection stated:

“Overall, Generative AI presents both exciting opportunities and challenges in higher education. By harnessing the power of AI thoughtfully and responsibly, educational institutions can create innovative learning experiences, foster critical thinking, and prepare students for a technology-driven world. Embracing AI as a valuable tool alongside traditional teaching methods can lead to a more effective and inclusive educational landscape.”

As GenAI rapidly expands and permeates society and education systems, from preschool to tertiary education, the swift progression of AI will bring about continual changes in students' attitudes and behaviors. For many students, the question is no longer whether GenAI belongs in their study practices, but how comfortably and pragmatically it can be accepted, leveraging efficiencies without outsourcing the learning that HE is expected to cultivate. Educators and institutions need to support students in learning how to use GenAI effectively and ethically to maximise their learning experience and prepare them for their future careers.

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None

Data Availability

The survey data, including data collection instrument, has been included as a supplementary file.

Competing Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Human Ethics Declaration

Ethical approval for this project was granted by the University of Adelaide's Human Research Ethics Committee (HREC) School of Psychology sub-committee on 17/8/23. The research was conducted in accordance with the Australian National Statement on Ethical Conduct in Human Research (2025).

Consent to Participate declaration

Participants gave informed written consent via Qualtrics before partaking in the online survey.

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