

Understanding Students' Perspectives on Using GenAI for Their Coursework in Science Higher Education

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Abstract

The accelerated expansion of Generative AI (GenAI) is transforming education. While it offers notable teaching and learning benefits, concerns regarding academic integrity and plagiarism remain. The Hong Kong Polytechnic University (PolyU) has been promoting the integration of GenAI into its learning, teaching, and assessment strategy. To examine challenges and opportunities, the authors conducted a pilot study with 31 science students from the Department of Applied Biology and Chemical Technology (ABCT), exploring their perspectives and GenAI usage in coursework. About half used GenAI mainly for brainstorming, summarising, and information searching, while multimedia creation was less common (26%). Most students agreed on responsible practices, particularly tool selection and integrity, though only 45% recognised privacy risks. Key benefits included time-saving ($M = 4.05$) and obtaining insights ($M = 3.85$). Challenges such as unreliable outputs and ethical concerns highlight the need for AI literacy training and clear academic integrity guidelines.

Keywords: GenAI tools, Science education, Students' perception, Assessments

1. Introduction

The rapid development of generative artificial intelligence (GenAI) tools, such as ChatGPT, Gemini, Copilot, DeepSeek, and others, has significantly influenced higher education, particularly in assessment practices. Research studies explore the potential benefits of GenAI in higher education assessments. For instance, Alier et al. (2024) and Zaibout and Madrane (2024) suggested that AI can enhance assessment through personalised testing, instant feedback, and automated grading, supporting autonomous learning and reducing subjectivity. At the same time, worldwide educators are concerned about increased plagiarism and academic integrity problems due to the easily accessible GenAI tools (Alier et al., 2024).

Recent studies reveal diverse patterns of student adoption and perceptions of GenAI in academic contexts. For instance, Stranges and MacNutt (2025) surveyed 310 undergraduate health science students at UBC Okanagan, where GenAI was permitted to be used for reflective writing tasks. They found that only 33% of the respondents used GenAI for writing. Common reported GenAI usage included initiating drafts (36%) and revising existing drafts (37%), with perceived benefits such as improved efficiency (54%) and grade enhancement (38%). In contrast, Freeman (2025) reported widespread adoption among UK undergraduates, with 92% using GenAI for assessments and 18% incorporating AI-generated text. Similarly, Arbab et al. (2024) surveyed 145 students and found that 76% used AI primarily for idea generation, while nearly half considered it acceptable for AI to write. These findings highlight both the growing reliance on GenAI and the lack of clear institutional regulations governing its use.

The integration of GenAI into assessment has raised concerns about academic integrity. Moorhouse et al. (2023) emphasised the need for process-focused, staged assessments that promote critical thinking and AI literacy. Lodge et al. (2023) advocated for authentic engagement with AI through ethical practices such as prompt creation and reflective analysis. Chan and Colloton (2024) proposed metacognitive and self-regulated models that prioritise feedback and reflection over grades to address integrity challenges. Empirical studies further illustrate varied impacts of GenAI on learning outcomes. Smerdon (2024) found that 46 out of 69 students used AI for topic generation in a research proposal assignment, and the study showed no significant difference in scores compared to a control group. Conversely, Alimardani (2025) reported that law students often inserted fabricated citations and misleading facts when using GenAI, and recommended training to reduce integrity challenges.

According to many educational researches, redesigning assessments is necessary to safeguard academic integrity. Khlaif et al. (2025) introduced the “Against, Avoid, Adopt, and Explore” (AAAE) model, encouraging educators to move beyond traditional assessments and leverage AI for brainstorming, idea generation, and collaborative problem-solving. Similarly, Xia et al. (2024) warned that GenAI increases risks of cheating and high-scoring submissions, and they addressed the need for robust assessment strategies. Beyond assessment design, concerns extend to AI reliability and ethics. Khlaif et al. (2023) noted issues with source verification and authorship when using ChatGPT for research. Nikiforova and Georgiev (2024) found AI-text detectors unreliable for certain languages and hybrid content, and highlighted that face-to-face exams to be the most robust method to safeguard academic integrity. Ateeq et al. (2024) argued for a shift towards application-based, project-driven assessments

to reduce cheating risks, while Smolansky et al. (2023) and Gamage et al. (2023) highlighted the need for policies, training, and ethical guidelines to integrate GenAI responsibly.

In brief, these studies underscore the dual nature of GenAI in higher education; it is offering opportunities for innovation in education while posing challenges to academic integrity. Understanding students' perceptions and usage patterns is therefore critical for developing effective policies, alternative assessments, and pedagogical strategies that balance technological enhancement in education while maintaining ethical and educational goals.

To address these challenges, the first author collaborated with the University's Educational Development Centre (EDC) to conduct action research to investigate university students' perspectives and their usage of GenAI for their coursework. This paper will report our pilot study on a cohort of 31 Analytical Sciences for Testing and Certification (ASTC) students from the Department of Applied Biology and Chemical Technology (ABCT) and their use of GenAI tools for their assessments.

2. Methodology

The current study adopted a student survey developed by a larger project led by EDC. Informed by prior studies on university students' usage of Generative AI in higher education (e.g., Almossaad et al., 2024; Chan & Zhou, 2023; Wang et al., 2025), the survey collected students' views and experiences on using Generative AI (GenAI) in learning and completing assessment tasks in a science subject. It explored students' usage of GenAI in assessment, their perceived benefits, learning outcomes, and challenges, and their support needs. The study focused on the cohort subject ABCT4631 *Test Method, Measurement and Uncertainty*, which is a major core course for the Bachelor of Science in Analytical Sciences for Testing and Certification offered by the Department of Applied Biology and Chemical Technology. For the 2024/25 Semester 2, a total of 31 students enrolled in the subject. Student feedback was collected via an online survey using MS Forms.

2.1 Data Collection and Analysis

The student was set up online in MS Forms. The online survey was administered after students had completed their assessment tasks in the subject. Students were invited to answer the survey during a class session on 11 April 2025. Participation was voluntary. Data were cleaned and analysed using descriptive statistics (counts, percentages, means, and standard deviations).

2.2 Participants

A total of 20 undergraduate students from the same department participated in the survey, representing a response rate of 64.5% (20 out of 31 students enrolled in the subject). Table 1 shows the demographic characteristics of the participants. Most of them (95%, n=19) reported using GenAI tools in completing their assessment tasks.

Table 1. Demographic Characteristics of Participants

Characteristic	Full sample	
	<i>n</i>	%
Gender		
Female	7	35.0%
Male	13	65.0%
Year of Study		
3	19	95.0%
4 or above	1	5.0%
Use of GenAI		
Yes	19	95.0%
No	1	5.0%

Note: N = 20. Participants were on average 20.85 years old (SD = 1.09).

3. Results and Discussion

Frequency of Usage

Students used GenAI for brainstorming ideas (M = 3.53) and searching for information (M = 3.58) most frequently, with over 47–53% reporting “Often” or “Very often” (Table 2). Summarising information was also common (47%). Less frequent usage included multimedia creation (26%) and collaboration (26%).

Table 2. Frequency of Using GenAI Tools in Completing the Assessment Tasks (N = 19)

	Mean (M)	SD	% of 4 & 5
For brainstorming and generating ideas	3.53	0.84	52.6%
For searching information or literature	3.58	1.07	47.4%
For summarizing information	3.47	0.84	47.4%
For writing, proofreading and editing	3.00	1.05	36.8%
For translating	2.89	1.45	31.6%
For creating digital multimedia and presentations	2.74	1.24	26.3%
For analyzing data/ solving numerical problems/ coding/ programming	3.05	1.03	31.6%

For providing feedback to my work-in-progress	2.84	1.30	31.6%
For facilitating project collaboration	3.00	1.05	26.3%

Note: Question: How often did you use the GenAI tools to help you complete the assessment task(s)? Scale: 1=Never; 2 = Seldom; 3 = Sometimes; 4 = Often; 5 = Very often.

Responsible Use

Students generally agreed they have used GenAI responsibly, with the overall mean $\approx$ above the mid-point, 3, in all the related items (Table 3). In particular, selecting suitable tools and upholding academic integrity got the highest mean ratings (both $M = 3.79$). Additionally, more than half of the students agreed or strongly agreed that they cross-checked information, questioned underlying assumptions and biases, and chose appropriate solutions from GenAI outputs. Only about 42.1% of respondents were aware of privacy and information security issues when using GenAI tools. Our students have also informally shared that GenAI tools may not be reliable for calculations in this subject due to inconsistencies in the answers provided.

Table 3. Responsible Use of GenAI Tools (N = 19)

	Mean (M)	SD	% of 4 & 5
I can select the most suitable GenAI tools for various tasks.	3.79	0.71	63.2%
I always uphold academic integrity/honesty when using GenAI tools.	3.79	0.98	52.6%
I cross-check information provided by GenAI tools with other sources.	3.68	0.75	52.6%
I question the assumptions and biases underlying the information provided by GenAI tools.	3.63	0.76	57.9%
I can choose the appropriate solution from the various solutions provided by GenAI tools.	3.63	0.83	52.6%
I can evaluate the functionality and limitations of GenAI tools or products.	3.63	0.76	47.4%
I compare multiple sources of information before forming an opinion based on GenAI recommendations.	3.53	0.90	47.4%
I am always aware of the misuse of GenAI technology.	3.47	0.90	42.1%
I am always aware of privacy and information security issues when using GenAI tools.	3.42	0.84	42.1%

Note: Question: To what extent do you agree with the following statements when using GenAI tools to complete the assessment task(s)? Scale: 1 = Strongly Disagree, 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree.

Perceived Benefits and Learning Outcomes

Students also rated the extent to which GenAI tools have benefited them and their concern or difficulty when using GenAI tools in the assessment task(s), as summarised below:

Perceived benefits and learning outcomes: The highest-rated benefit was saving time finding information ($M = 4.05$; 70%), followed by obtaining insights ($M = 3.85$; 60%) and building confidence in preparing the assessment ($M = 3.85$; 55%) (Table 4). Other areas, such as reducing stress and clarifying expectations, were also positively rated (55%). Students reported moderate gains in problem-solving ($M = 3.65$; 50%) and judging GenAI output quality (55%) (Table 4). Improvements in creativity (25%) and communication skills (30%) were the least agreed upon. Only 30% of respondents reported that AI motivated their learning.

Table 4. Perceived Benefits (N = 20)

	Mean (M)	SD	% of 4 & 5
Helping me save time in finding information	4.05	0.94	70.0%
Obtaining new and useful insights and perspectives	3.85	0.81	60.0%
Becoming more confident in preparing the assessment task(s)	3.85	0.88	55.0%
Helping me save time in producing the work (e.g. reports, videos, graphics, powerpoint slides)	3.80	1.06	55.0%
Obtaining immediate and personalised feedback for improving my assessment task(s)	3.80	0.95	55.0%
Understanding the expectations and requirements of the assessment task(s)	3.75	0.91	55.0%
Becoming less stressed in preparing the assessment task(s)	3.75	0.91	55.0%
Preparing for what to include and how to complete my assessment task(s)	3.65	0.81	55.0%

Note: Question: To what extent do you agree that GenAI tools have assisted you in completing the assessment task(s) in the following ways? Scale: 1 = Strongly Disagree, 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree; Not applicable = have not used GenAI in the specific way.

Table 5. Perceived Learning Outcomes (N = 20)

The GenAI-expected assessment task(s)...	Mean (M)	SD	% of 4 & 5
enhanced my problem-solving skills	3.65	0.75	50.0%
enhanced my skills in judging the quality of GenAI output	3.60	0.75	55.0%

enhanced my understanding of subject knowledge and theories	3.55	0.76	50.0%
enhanced my critical thinking skills	3.50	0.83	40.0%
enhanced my ability in using GenAI tools (AI literacy/competence)	3.50	0.83	40.0%
motivated me to learn this subject	3.45	0.76	30.0%
enhanced my communication skills	3.40	0.68	30.0%
enhanced my creativity	3.35	0.67	25.0%

Note: Question: To what extent do you agree the GenAI-expected assessment task(s) helped you in the following ways? Scale: 1 = Strongly Disagree, 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree.

Challenges and Support Needed

Top concerns from students were unreliable information from GenAI tools ($M = 3.70$) with 55% agreement (Table 6). Only 20% of students agreed/strongly agreed that they were not familiar with the GenAI tools. Other concerns involved ethical issues, academic integrity, and data privacy and security ($M \geq 3.4$; 45%). 40% of respondents reported over-relying on GenAI tools for completing their assessments. Most students requested training (60%) and guidelines/examples (55%), while 40% wanted additional tool access. Half of the students preferred using GenAI for assessments.

Table 6. Concerns/Challenges when using GenAI Tools (N = 20)

	Mean (M)	SD	% of 4 & 5
Unreliable/Inaccurate information/hallucinations	3.70	0.98	55.0%
Limited access to the GenAI tools	3.70	0.80	50.0%
Subscription fee for accessing advanced features	3.65	0.88	50.0%
Over relying on GenAI tools	3.45	1.05	40.0%
Privacy and data security	3.45	1.00	45.0%
More time to complete the assessment task	3.40	0.88	35.0%
Ethical concerns/academic integrity	3.40	0.88	45.0%
Lack of prompting skills	3.35	0.75	40.0%
Worries about being falsely accused of committing plagiarism	3.35	0.88	40.0%
Not familiar with the GenAI tool(s) (required by your teacher(s))	3.20	0.62	20.0%

Note: Question: To what extent do you agree the following is a concern or difficulty when using GenAI tools in the assessment task(s)? Scale: 1 = Strongly Disagree, 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree.

4. Implications

The rapid development of GenAI and students' over-reliance on the tools pose threats to academic integrity and plagiarism. In our preliminary study, about half of the respondents used GenAI mainly for brainstorming, summarising, and searching for information, while fewer students reported using it for data analysis, numerical problems, multi-media generation, or collaboration. This pattern suggests that Science students may strategically use GenAI tools as a supportive tool based on task demands, rather than relying on it to complete assessment tasks. Arguably, this reflects disciplinary norms in Science education, where numerical accuracy, methodological rigour, and verification are highly valued.

We found out that most students agreed/strongly agreed (52.6%) on responsible practices such as upholding academic integrity, cross-checking information produced by GenAI, but only 45% recognised the issues of data privacy and security. Challenges such as unreliable outputs and ethical concerns highlight the need for AI literacy training and clear academic integrity guidelines. Teaching strategies that explicitly model effective prompting, source verification, and critical evaluation of GenAI output may help students to use GenAI tools more reflectively and meaningfully. Incorporating scaffolded GenAI activities into coursework, such as comparing AI-generated explanations with authoritative scientific sources like peer-reviewed journals, can further support students in developing their scientific reasoning and evaluative judgement.

Owing to the small sample size, further investigation in the future will be conducted to confirm our findings. Although the small sample size limits the generalisability of its findings, this study offers a valuable starting point for rethinking how GenAI can be more intentionally integrated into Science education in ways that enhance learning while safeguarding academic and ethical standards in the age of GenAI.

Acknowledgments

This study was part of a larger project titled, *Exemplary learning, teaching and assessment practices in UGC-funded institutions in the age of GenAI*, supported by the Fund for Innovative Technology-in-Education (FITE) of the University Grants Committee (UGC). We gratefully acknowledge this support, as well as the assistance provided by the Educational Development Centre and colleagues for their assistance in data collection and analysis, and for the valuable feedback on the survey design. The authors would also like to thank the FLTI seed fund project "Developing a Flipped Learning Signature Showcase" (Ref. no.: Invite-FS-ABCT) for ABCT to support this study.

Ethical Declaration Statement

Ethical approval was obtained from the Institutional Review Board (IRB) of The Hong Kong Polytechnic University (Reference Number: HSEARS20240522003).

Generative AI Policy

The author(s) used MS Co-pilot during the preparation of this work to enhance the clarity of the text and streamline the drafting process. After utilising the tool/service, the author(s) thoroughly reviewed and edited the content as necessary and assumed full responsibility for the publication's content.

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