

Teachers' Perceptions of Students' Use of Generative AI in Summative Assessments at Higher Education Institutions: An Exploratory Study

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Abstract

The rise of generative AI (GAI) is affecting various sectors, including higher education (HE). In HE, educators are grappling with students' use of GAI, which might infringe upon academic integrity. Given the pervasiveness of this technology, particularly through free AI tools, it should be utilised for its benefits rather than merely blocked. Thus, responsible use of AI in higher education is essential. However, encouraging students to openly declare their use of AI in summative assessments, for transparency purposes, has led to fears of negative perception and potential marking down by teachers. There is currently limited research in this area. Hence, this study aims to explore the boundary of students using GAI in assessments by gathering views from teachers through an exploratory survey. It contributes theoretically to responsible AI literature, extending it to HE, and practically by developing guidelines for AI use in student assessments, potentially informing university policy.

Keywords: Generative AI, Exploratory Research, Responsible AI, Teachers' Perception, Higher Education

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1.0 Introduction

The term “Artificial Intelligence” (AI) was officially coined in 1956 by a group of computer scientists during the Dartmouth Summer Research Project on Artificial Intelligence (DSRPAI) at Dartmouth College in New Hampshire (Haenlein & Kaplan, 2019). AI is seen as a system capable of interpreting external data accurately, learning from this data, and using these learnings to achieve specific goals and tasks through flexible adaptation (Haenlein & Kaplan, 2019).

The inception of AI use in teaching and learning can be traced back to 1924 when Sidney Pressey used a machine to assist students in finding correct answers to multiple-choice questions (Namatherdhala et al., 2022). Since then, AI has been adopted to personalise learning for students, tailoring to their learning goals and preferences based on performance, demographics, and behavioural information (Kaplan-Rakowski et al., 2023). However, OpenAI shocked various sectors in year 2022, including Higher Education (HE), with the release of ChatGPT, a chatbot driven by Generative AI (GAI) (OpenAI, 2022). GAI, trained on large language models (LLMs), can generate human-like text based on given prompts or contexts and is capable of performing natural language processing tasks such as text completion, conversation generation, and language translation (Baidoo-Anu & Ansah, 2023). The immediate concern within HE is that students might use this tool for writing assignments, coursework, or even answering open-book exams, potentially breaching academic integrity (Michel-Villarreal et al., 2023). However, a recent report from UNESCO (2023), suggests that the use of GAI tools is not entirely negative if used responsibly.

Nevertheless, since the emergence of GAI, there has been growing research on its adoption and how teachers or students perceive it in HE, as seen in Chan and Hu (2023) and Amani et al. (2023). However, limited research exists on teachers' perceptions of students using GAI in their summative assessments, such as written coursework, essays, online open-book exams, presentations, and media productions (e.g., videos, films, animations). While universities have issued some guidance on declaring the use of GAI tools, students might be reluctant to disclose their use of GAI if they fear negative perceptions from teachers. This research aims to address this research question - *How do teachers perceive students' use of GAI in summative assessments at HE institutions?* This paper is organised as follows. Section 2 covers related work on the application of GAI in HE, incorporating a responsible lens. Section 3 illustrates the research

methodology, guided by an exploratory survey, and Section 4 presents the results. The paper concludes with discussions, research implications and future work in Section 5.

2.0 Related Work

2.1 GAI in Higher Education

The rise of GAI has been met with intense interest in HE. Universities were quick to react and develop guidelines for the use of GAI, initiated working groups, and met in cross-organisational fora to discuss the impact of this technology. Multiple practitioner publications highlighted the opportunities and challenges of GAI for the sector (e.g., Hodges & Ocak, 2023; Schroeder, 2023).

Research soon followed. Existing papers focus on understanding the potential uses of GAI in HE and conceptualising the challenges. For example, Michel-Villarreal et al. (2023) outline that GAI can be used to generate answers to questions and ideas for essays, provide feedback, simulate a tutor. Research into students' perspectives shows a recognition of the potential of GAI in personalised learning support, writing, brainstorming, and research and analysis (Chan & Hu, 2023). From a teacher's perspective, it can create lesson plans, develop resources, and even assess written work (Baidoo-Anu & Ansah, 2023). For example, Kim et al. (2019) show that ChatGPT trained on human-graded essays could grade high school student essays with a correlation of 0.86 with human graders. The UNESCO (2023) report outlines ten roles illustrating how ChatGPT could be useful in the teaching and learning process. However, less research interest so far has been given to administrators' perspectives, and yet GAI has been found to be useful in administrative support with repetitive or tedious administrative tasks (Chan & Hu, 2023), creating manuals, or developing policy documents (Yeralan & Lee, 2023). Yet, the use of GAI in HE is a contentious topic, with multiple responsibility and ethics implications.

2.2 Responsible Use of AI in HE

The growth in AI in general and GAI in particular has been accompanied by increased interest in responsible AI, that is a growing consensus that the use of AI should follow principles consistent with user expectations, organisational values, and societal laws and norms (Mikalef et al., 2022). Table 1 distils these dimensions into the principles of responsible AI in HE. Responsible AI is often discussed along the principles of fairness,

transparency, and accountability. For example, the principle of fairness as applied to HE suggests that the use of AI in this sector should enable inclusion and diversity and not lead to discriminatory outcomes between students. Transparency suggests that the use of AI in HE should be openly communicated and facilitate traceability. Accountability entails using AI in line with the set policies and regulations.

Responsible GAI comes into particular focus in HE in discussions around assessment. While GAI can be used by students in assessed work to help generate ideas, conduct research, or improve writing (Smolansky et al., 2023), it can also be deployed in ways that may go against the principles of responsible AI in HE. GAI can be potentially used by students to submit work prepared by GAI rather than themselves and not disclose it, which goes against the principle of transparent use. The use of GAI in assessment may reduce students' accountability for their own intellectual work and propagate plagiarism against university policies. Fairness may be at stake as well, as deploying GAI in assessment may lead to obtaining better marks. Both students and teachers admit that GAI has an impact on a range of assessment types, from short answer questions, through essays, to creative work and presentations (Smolansky et al., 2023).

By acknowledging assessments may particularly be impacted by GAI, attempts have been made to minimise this by implementing the responsible AI principles. For example, researchers investigate how to develop AI-proof forms of assessment (Rudolph et al., 2023), and how to develop tools capable of identifying the use of GAI (Lacey & Smith, 2023). Existing research suggests that teachers are concerned about the use of GAI in assessment and aim to work out alternatives that either preclude such a possibility or make it easier to detect it (Smolansky et al., 2023). This indicates that teachers may be against the GAI use by students, but little research has been conducted in this area.

3.0 Research Methodology

Following Chan and Hu (2023) and Chan and Lee (2023), this study employed the exploratory study by using an online survey methodology to investigate teachers' perceptions on students' use of GAI tools in their summative assessment within HE. The survey encompassed a set of closed questions and two open-ended questions, with the goal of acquiring a holistic comprehension of participants' viewpoints.

Responsible AI principles	AI Use in HE	Sources adapted
Transparency	Must be disclosed, communicated, and understood by those involved, with clear oversight principles established.	(Clarke, 2019; Jobin et al., 2019; Mezgár & Váncza, 2022; Mhlanga, 2023; Noble & Dubljević, 2022)
Justice and fairness	Should be unbiased, promoting justice, diversity, and inclusion while addressing inequalities in access to education.	(Jobin et al., 2019; Mhlanga, 2023; Noble & Dubljević, 2022)
Non-maleficence	Must prioritise student safety and wellbeing, ensuring protection from potential threats.	(Clarke, 2019; Jobin et al., 2019; Mezgár & Váncza, 2022; Noble & Dubljević, 2022)
Responsibility / Accountability	Must follow accountability and liability rules, align with policies, and have clear regulations and consequences for non-compliance.	(Clarke, 2019; Jobin et al., 2019; Mhlanga, 2023; Noble & Dubljević, 2022)
Professional responsibility	Should be used purposefully, in collaboration with institutional staff, and maintain dialogue with relevant bodies.	(Noble & Dubljević, 2022)
Privacy / Consent	Must protect user privacy, provide consent options, and allow data use control.	(Jobin et al., 2019; Mhlanga, 2023; Noble & Dubljević, 2022)
Beneficence / Promotion of Human Values / Perceived Benefits / Education Values	Should prioritise wellbeing, the common good, and human values, aiming to benefit society, advance civilisation, and uphold human rights.	(Chan & Hu, 2023; Clarke, 2019; Jobin et al., 2019; Mezgár & Váncza, 2022; Noble & Dubljević, 2022)
Freedom and autonomy / Human control of technology / Dignity / Digital Literacy	Should be deployed to empower all stakeholders, remaining under human control and open to review. HE institutions must educate students on AI's functions, uses, limitations, and ethical considerations, enabling informed choices in their academic and future endeavours.	(Clarke, 2019; Jobin et al., 2019; Mezgár & Váncza, 2022; Mhlanga, 2023; Noble & Dubljević, 2022)
Trust	Stakeholders can trust AI to unlock potential and add significant value to pedagogy and teaching.	(Jobin et al., 2019; Mezgár & Váncza, 2022)
Sustainability and Inclusivity	HE institutions should embed AI sustainably without compromising core values, using it to foster sustainable societies and champion inclusive education, including tailored support for disabled students and top-tier education to students in remote learning.	(Jobin et al., 2019; Noble & Dubljević, 2022)

Solidarity	AI benefits in teaching and learning must be equitably shared among all stakeholders, ensuring no undue advantage for any group.	(Jobin et al., 2019)
Quality Assurance	AI deployment must be underpinned by rigorous regulations and standards, subject to regular review.	(Clarke, 2019)
Data Accuracy	It's vital that data from GAI tools is accurate, and both teachers and learners should critically assess information and cross-check with trustworthy sources.	(Mhlanga, 2023)
Robustness and Resilience	All stakeholders in AI in HE must ensure its robust and resilient, with responsibility proportional to benefits, data sensitivity, and potential risks in education.	(Clarke, 2019)
General Impact	Should evaluate the positive and negative consequences and implications of employing AI.	(Clarke, 2019)
Human-centred Design	AI systems should be customised for students and teachers, involving them in development, regularly gathering their feedback, and adapting to their academic experiences.	(Mezgár & Váncza, 2022)
Continuous Learning and Adaptability / Learning Skills	AI systems must continually learn and adapt, adjusting to student feedback, evolving educational standards, and AI advancements.	(Chan & Hu, 2023)
Ethics	AI research tools must uphold research ethics, including minimising harm, ensuring informed consent, and maintaining data confidentiality.	(Amani et al., 2023)

Table 1. Responsible AI principles in HE

A convenience sampling approach from Edgar and Manz (2017) was adopted to enlist participants for the study. The survey link was distributed to teachers or teaching academics in HE institutions across diverse international social media groups. Participants were presented with an informed consent form on the online platform, ensuring their awareness of the study's objectives and their rights as participants. The survey questions were adapted from the roles of how GAI tools could be applied in HE issued by UNESCO (2023) and responsible AI principles in Table 1. A five-point Likert scale (1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree) was used for these questions. The collected data underwent rigorous descriptive analysis, examining the quantitative responses to closed questions. Thematic analysis was employed for analysing the data collected from the open-ended questions. Section 4 discusses the results.

4.0 Results

4.1 Demographics

Table 2 shows the full demographic information. Through the survey, 66 responses were collected, with most respondents falling into the 40-49 age group (39.4%) and being male (60.6%). Most respondents teach in the STEM field (56.1%) and have more than ten years of teaching experience (57.6%). Geographically, most respondents primarily teach in the United Kingdom (50.0%), followed by Saudi Arabia (16.7%). Other countries represented include the United States of America, the United Arab Emirates, Malaysia, China, Singapore, Ireland, and Portugal.

Characteristics	Count (n)	Percentage (%)
Age Group		
20 and below	1	1.5%
30-39	19	28.8%
40-49	26	39.4%
50-59	14	21.2%
60-69	5	7.6%
70 and older	1	1.5%
Gender		
Female	26	39.4%
Male	40	60.6%
Teaching Domain		
STEM	37	56.1%
Non-STEM	29	43.9%
Level of teaching experience		
Less than two years	2	3.0%
Two to five years	9	13.6%
Five to ten years	17	25.8%
More than ten years	38	57.6%
Country where the participant primarily teaches		
China	3	4.5%
Ireland	1	1.5%
Malaysia	4	6.1%
Portugal	1	1.5%
Saudi Arabia	11	16.7%
Singapore	2	3.0%
United Arab Emirates	6	9.1%
United Kingdom	33	50.0%
United States of America	5	7.6%

Table 2. Demographic Information

4.2 Familiarity with the GAI Tools and Frequency of Use

As shown in Table 3, most respondents have a moderate familiarity with GAI tools (42%), and 79% of them have created an account and used GAI tools for either personal or educational purposes. This indicates a high level of engagement with GAI tools among the respondents.

Characteristics	Count (n)	Percentage (%)
Familiarity with GAI tools		
Not familiar at all	1	1.5%
Slightly familiar	12	18.2%
Moderately familiar	28	42.4%
Very familiar	21	31.8%
Extremely familiar	4	6.1%
GAI tools account creation for any purpose (either personal or educational)		
Yes	55	83.3%
No	11	16.7%

Table 3. Respondents' Familiarity and Engagement with General AI Tools

Based on the 55 respondents who have signed up for a GAI tool account, Table 4 shows that the majority have used GAI tools for a period ranging from 1 to 6 months, with the highest percentages observed at 4 and 6 months, both at 14.5%. Adoption appears to decrease as the duration increases, with only 3.6% of respondents using GAI tools for more than 12 months. These findings suggest that most respondents are relatively new to using GAI tools, with a significant drop in usage beyond 6 months. This may be also because the most popular GAI tools have only emerged approximately 11 to 12 months ago, thereby providing a limited timeframe for the respondents to integrate these tools into their daily activities.

According to Table 5, ChatGPT is the most frequently used tool, with 40.7% of respondents using it once a week, 24.1% using it twice a week, 7.4% using it three times a week, and 25.9% using it more than three times a week. Only 1.9% of respondents never use ChatGPT. Google Bard, Bing Chat, and Microsoft 365 Copilot are used much less frequently, with more than 70% of respondents never using these tools. Snapchat AI also has a high percentage of respondents who never use it (88.6%), with small percentages using it at varying frequencies.

Months of using GAI tools	Count (n)	Percentage (%)
1 month	6	10.9%
2 months	5	9.1%
3 months	7	12.7%
4 months	8	14.5%
5 months	6	10.9%
6 months	8	14.5%
7 months	5	9.1%
8 months	1	1.8%
9 months	1	1.8%
10 months	5	9.1%
12 months	1	1.8%
11 months	0	0.0%
More than 12 months	2	3.6%

Table 4. Months of Using GAI Tools

The 'Others' category has a more even distribution across different frequencies, totalling 18.9%. The GAI tools included in this category are GrammarlyGo, Ernie Bot, Wordtune, Perplexity, Midjourney, Gamma, Notion, Hypotenuse AI, Writesonic, Invideo.io, and customised GAI tools utilising the GPT-4 API.

GAI tools		Frequency					Total
		Never	Once a week	Twice a week	Three times a week	More than three times a week	
ChatGPT	Count (n)	1	22	13	4	14	54
	Percentage (%)	1.9%	40.7%	24.1%	7.4%	25.9%	100.0%
Google Bard	Count (n)	34	8	2	2	2	48
	Percentage (%)	70.8%	16.7%	4.2%	4.2%	4.2%	100.0%
Bing Chat	Count (n)	34	6	3	2	3	48
	Percentage (%)	70.8%	12.5%	6.3%	4.2%	6.3%	100.0%
Microsoft 365 Copilot	Count (n)	41	2	1	0	1	45
	Percentage (%)	91.1%	4.4%	2.2%	0.0%	2.2%	100.0%
Snapchat AI	Count (n)	39	3	1	1	0	44
	Percentage (%)	88.6%	6.8%	2.3%	2.3%	0.0%	100.0%
Others	Count (n)	30	1	3	0	3	37
	Percentage (%)	81.1%	2.7%	8.1%	0.0%	8.1%	100.0%

Table 5. Frequency of Usage of Various GAI Tools

4.3 Teachers' Perceptions of Students' Use of Generative AI in Their Summative Assessments

4.3.1 Roles of GAI Tools in Students' Summative Assessments

Based on the findings as shown in Table 6, the respondents generally have a positive perception of students using GAI tools in their summative assessments, as evidenced by the median scores of 4 for all statements. This suggests that most respondents are open to, or accepting of, the idea of students leveraging GAI tools for various aspects of their assessments. However, the mean scores reveal some differences in the level of acceptance across different uses of GAI tools.

No	Statement	Median	Mean	Standard Deviation
1	I can accept students using GAI tools to write queries and examine alternative responses for their assessments.	4.00	3.32	1.10
2	I can accept students entering prompts into various GAI tools, following the structure of a conversation or debate, to produce critical arguments for their assessments.	4.00	3.29	1.08
3	I can accept that working in groups, students use any GAI tools to find out information to complete tasks and assignments.	4.00	3.58	1.10
4	I can accept that students use various GAI tools to provide personalised feedback to them, based on information provided by students or teachers (e.g., formative feedback).	4.00	3.44	1.22
5	I can accept that students explain their current level of understanding related to the assessments to various GAI tools, and ask for ways to help them study the related material and prepare for other tasks in the assessment.	4.00	3.65	1.10
6	I can accept that students ask various GAI tools for ideas about how to extend their learning after receiving the scores for their assessment.	4.00	3.76	1.08
7	I can accept that students interact with various GAI tools in a tutorial-type dialogue, and then ask the tool to produce a summary of their current state of knowledge for their assessment.	4.00	3.56	1.12
8	I can accept that students ask various GAI tools to proofread the language of their assessment.	4.00	3.79	0.98

Table 6. Roles of GAI Tools

Respondents are most accepting of students using GAI tools for proofreading the language of their assessments (Statement 8, Mean: 3.79) and seeking ideas for extending their learning post-assessment (Statement 6, Mean: 3.76). This indicates a recognition of the value of GAI tools as supportive resources for enhancing learning experiences and improving work quality. However, respondents are less accepting of students using GAI tools to generate critical arguments for their assessments (Statement 2, Mean, 3.29). This suggests a preference for students to develop their critical thinking and produce arguments independently, rather than relying on GAI tools for such complex cognitive tasks. Statements 3 and 7 both have Mean scores above 3.5, but Standard Deviations above 1.10, indicating a moderate level of acceptance but with some variability in responses.

4.3.2 Responsible Use of GAI Tools

Table 7 presents the results pertaining to students' responsible use of GAI tools in their summative assessments from various perspectives. Most respondents express a general acceptance towards the responsible utilisation of GAI tools by students in their summative assessments. This is reflected in the median values of 4.00 for Statements 1, 2, 3, 4, 6, 7, 8, 9, 11, 13, 14, 15, 17, 18, and 20, indicating agreement with the statements. The Mean values for these statements range from 3.45 to 3.97, further cementing this stance.

No	Statement	Median	Mean	Standard Deviation
1	I can accept students using GAI tools to support the production of their assessments, such as proofreading and idea creation, as long as they declare the use of it, but they must not use it to produce or write the entire assessment, such as content generation.	4.00	3.79	1.14
2	If I refrain from judging their use of GAI tools, my students will likely feel more at ease both using it and declaring its use.	4.00	3.71	0.91
3	If students are using GAI tools ethically, it will not affect the way I mark their assessment.	4.00	3.83	1.10
4	I can accept students' use of GAI tools in their assessments as long as they are aware of the tools are not substitute for human tutors.	4.00	3.68	1.15
5	I can trust my students to use GAI tools in their assessments responsibly and ethically.	2.00	2.64	1.05

6	I can accept students citing information from GAI tools in their assessment by justifying its relevance and confirming the accuracy of the information by comparing it with other sources or using personal judgement	4.00	3.52	1.11
7	I can accept that students use GAI tools, employing various plug-ins or functions, for idea creation when producing their assessments.	4.00	3.53	1.06
8	I believe that all students should be given access to the same GAI tools for their assessments to ensure inclusivity and equity.	4.00	3.59	1.20
9	I believe that students' use of GAI tools in their assessments will help them learn in an efficient way, as the tools can provide preliminary feedback.	4.00	3.45	1.10
10	I think GAI tools is a great tool for supporting students' assessment due to anonymity.	3.00	2.98	1.22
11	I believe that GAI tools could contribute to academic dishonesty behaviours.	4.00	3.70	1.16
12	I believe that using GAI tools to complete assignments undermines the value of university education.	3.00	3.00	1.15
13	GAI tools may reduce students' opportunities to interact with peers and socialise during coursework completion.	4.00	3.41	1.08
14	GAI tools may impede students' cultivation of generic or transferable skills, including teamwork, problem-solving, and leadership skills.	4.00	3.44	1.08
15	There's a risk that students might become overly dependent on GAI tools.	4.00	3.97	1.12
16	I believe that using GAI tools, to write essays or generate answers can enhance originality and creativity in students' work.	3.00	2.89	1.10
17	I believe that GAI tools can bolster students' digital competence.	4.00	3.62	1.00
18	I believe that GAI tools can help students save time.	4.00	3.67	1.09
19	I think that GAI tools can help students in becoming better writers.	3.00	3.23	1.17
20	In the long run, the integration of GAI tools in higher education is likely to have a positive impact on teaching and learning, influencing how students are taught and assessed.	4.00	3.68	1.03

Table 7. Responsible Use of GAI Tools

As per Statement 3, respondents generally concur that if students employ GAI tools responsibly, it will not impinge the way they mark assessments (Mean: 3.83, SD: 1.10). Statements 1 (Mean: 3.79; SD: 1.14), 4 (Mean: 3.68; SD: 1.15), 6 (Mean: 3.52; SD: 1.11), and 7 (Mean: 3.53; SD: 1.06) imply a conditional acceptance of students using GAI tools in their summative assessments for tasks such as proofreading, idea generation, acknowledging that GAI tools are not substitutes for human judgement, and critically evaluating the information generated by GAI tools.

A significant concern from the respondents is the lack of trust in students to use GAI tools responsibly, as shown in Statement 5 (Median: 2.00; Mean: 2.64), although the Standard Deviation indicates a moderate range of opinions among respondents on this issue. There are concerns about the potential for academic dishonesty, as indicated in Statement 11, although the Standard Deviation suggests moderate agreement among respondents on this matter (Mean: 3.76; SD: 1.16). Similarly, Statement 15 shows that respondents are concerned about students becoming overly dependent on GAI tools (Mean: 3.97; SD: 1.12). The role of anonymity in assessments, as in Statement 10, is a contentious issue (Median: 3.00; Mean: 2.98, SD: 1.22), and the highest SD indicates a diverse range of respondents' opinions.

Despite these concerns, respondents see potential benefits in GAI tools, such as enhancing originality and creativity, as indicated in Statement 16 (Median: 3.00, Mean: 2.89, SD: 1.10); bolstering digital competence, as in Statement 17 (Median: 4.00, Mean: 3.62, SD: 1.00); and saving time, as in Statement 18 (Median: 4.00, Mean: 3.67, SD: 1.09). In the long run, as indicated in Statement 20, respondents believe that the integration of GAI tools in higher education is likely to have a positive impact on teaching and learning (Median: 4.00; Mean: 3.68, SD: 1.03).

4.4 Governance of the Use of GAI Tools in Higher Education

Based on the open-ended questions where respondents were asked for additional comments about their perception of students' use of GAI tools in their summative assessments, they acknowledged the inevitability of students utilising GAI tools. Table 8 presents the results of a thematic analysis on the governance of GAI tools in HE institutions, which include the codes clustered into four main themes (*Guidelines for Responsible Use of GAI Tools, Regulations, Assessment and Academic Integrity, Training and Education*) along with the relevant sample quotes from the respondents.

Themes	Codes	Sample Quotes
Guidelines for Responsible Use of GAI Tools	HE Institutions Guideline	Respondent 52 - <i>"The HEI bodies should introduce, not only Russel group, which has produced a guidelines, but other at national or even international level should have the ethical guidelines, and acceptable use of GAI tools in HEIs."</i>
	Transparency	Respondent 12 - <i>"A full transcript of interaction between student and AI plus a summary of used inputs should be submitted with any thesis."</i> Respondent 19 - <i>"Student must provide a log, with timestamps when they use GAI for particular assignments"</i> Respondent 40 - <i>"Ensure transparency in AI systems and algorithms, including disclosing the sources of data, the methods used, and potential biases."</i>
	Accountability	Respondent 32 - <i>"...student takes ownership of their work and use GAI as a supplementary method to enhance to quality of their work."</i> Respondent 23 - <i>"Lecturers should be in control and aware of the sentence pattern created using GAI."</i> Respondent 40 - <i>"Hold individuals and departments accountable for their use of AI."</i>
	Bias Mitigation	Respondent 40 - <i>"Address bias in AI algorithms and data to ensure fairness and inclusivity."</i>
	Data Privacy and Security	Respondent 40 - <i>"Implement strong data privacy and security measures to protect sensitive information, ensuring compliance with relevant data protection laws and regulations such as GDPR."</i>
	Acceptable Use	Respondent 45 - <i>"The content generated should be treated as a framework/ broad guideline as against treating it as the final product."</i> Respondent 52 - <i>"Students should learn about prompt engineering to better use GAI tools"</i> Respondent 62 - <i>"Use it wisely, especially in the process of idea generation would be good."</i> Respondent 64 - <i>"Some students may find AI great for supporting their learning (e.g. proofreading or for systematising information)."</i>
Regulations	Academic Regulations	Respondent 21 - <i>"Academic regulations need to be updated."</i>
	Legal Compliance	Respondent 40 - <i>"Ensure compliance with all relevant laws and regulations related to AI, including intellectual property, data protection, and non-discrimination laws."</i>
	Review	Respondent 40 - <i>"Regularly review and update AI governance policies to adapt to evolving technologies, societal norms, and emerging ethical considerations."</i>

Assessment and Academic Integrity	Adjusting Assessments	Respondent 64 - <i>"Institutions need to start/continue debating the use of AI but I still think we should have one last point of assessment where students don't have access to any AI tool... students should be able to demonstrate part of their learning path without the help of these tools."</i>
	Plagiarism Prevention	Respondent 56 - <i>"It can be integrated with Turnitin to identify plagiarism."</i>
	AI Referencing	Respondent 32 - <i>"Made mandatory for the students to acknowledge the use of GAI in their assignments and highlight the aspects/elements of the assignments supported by GAI"</i>
	Formative Assessment	Respondent 63 - <i>"GAI should be widely used for formative assessment rather than summative assessment."</i>
	Summative Assessment	Respondent 26 - <i>"For some assessments, maybe it will be necessary to conduct them as invigilated exams again."</i>
Training and Education	Skill Development	Respondent 17 - <i>"...it also produce the wrong outcome, if they do not know how to ask. So, they at least need to understand the topic of what they are learning, and being able to assess if or not the generated contents are correct or not...to do that, it requires the deep knowledge of the topic and it is why the education is still important for us. "</i>
	Teacher's Role	Respondent 6 - <i>"Teachers must admit the change and do not force the students to lie. Faculties have to be more open for the change."</i>
	Staff Training	Respondent 21 - <i>"Universities need to provide clear leadership and guidance to staff, including training in the use of GAI."</i>
	Awareness	Respondent 40 - <i>"Educate stakeholders, including researchers, faculty, students, and administrators, about AI principles, potential risks, and ethical considerations to promote responsible AI use."</i>
	Digital Competence	Respondent 41 - <i>"Higher educational institutions should provide a curated GPT service to enhance the digital competence of staff and students."</i>
	Preparing Students for the Future Workplace	Respondent 26 - <i>"In HE, we will have to teach the use of GAI tools as preparation for the workplace."</i>

Table 9. Thematic Analysis Results

The *Guidelines for Responsible Use of GAI Tools* theme in HE encompasses several principles, as explained by the codes. *Transparency* in AI systems and algorithms is crucial to ensure *accountability* and ethical use. Students should be encouraged to use GAI as a supplementary method, taking ownership of their work, while faculty should maintain control and awareness of GAI-generated content. *Bias mitigation* in AI algorithms and data is essential to uphold fairness and inclusivity. Furthermore, robust *data privacy and security* measures must be in place to protect sensitive information. There should be a standardised *HE Institution Guideline* across the sector on the use of GAI tools. *Acceptable uses* generally include proofreading and idea generation.

Regarding the *Regulations* theme, it is imperative that *academic regulations* are updated and adapted to accommodate the use of GAI tools within HE institutions. This requires a comprehensive *review* of existing policies, alongside the introduction of new regulations specifically addressing the unique challenges and opportunities presented by GAI technology. Ensuring *legal compliance* with all relevant laws and regulations related to AI is a critical aspect of this process. Such measures will ensure that institutions can effectively manage and mitigate any risks associated with the use of GAI tools, while also maximising the potential benefits for both students and teachers. The *Assessment and Academic Integrity* theme reveals the importance of *adjusting assessment* methods to seamlessly integrate GAI tools. This adaptation is crucial to navigate the evolving landscape of academic integrity in the age of AI, particularly concerning *AI referencing* and citation practices. Incorporating AI text detectors could serve as a valuable component of *plagiarism prevention* strategies. GAI tools can be effectively employed for *formative assessments*, providing students with continuous and constructive feedback from tutors or lecturers. However, to uphold the academic integrity of *summative assessments*, it is advisable to conduct these evaluations without the reliance on AI tools, such as through invigilated exams. This approach ensures a comprehensive and fair assessment of a student's knowledge and capabilities.

Under the theme of *Training and Education*, as part of *skills development*, it is crucial to equip students with the necessary skills to effectively utilise GAI tools. This includes the ability to validate information obtained from these tools, which is a critical thinking skill in itself. Currently, there is a gap in students' proficiency in employing GAI tools effectively. *Teachers* play an integral *role* in guiding students on the appropriate use of GAI tools. In tandem, HE institutions should also provide *staff training* on the utilisation of GAI tools, as well as offering guidance on how to incorporate these tools

into teaching and learning processes. Moreover, it is important to raise *awareness* and educate all stakeholders about the principles of AI, potential risks, and ethical considerations associated with its use. Enhancing the digital competence of both staff and students is imperative, as is teaching the use of GAI tools as a means of *preparing students for the future workplace*.

Echoing the suggestions proposed by respondent 28 and 32, in governing the use of GAI tools in HE institutions, it might be useful to model the *'holistic life cycle of AI use in academic settings'*. HE institutions should play a proactive role in adapting academic practices by providing guidance to students on how to select a reliable tool, how to use them, how to apply critical thinking when analysing the AI output, and how AI has helped them in achieving the learning outcomes.

5.0 Discussions and Conclusion

5.1 Research Implications

This research explores the teachers' perceptions of students' use of GAI tools in their summative assessments. The findings indicate that teachers are inclined to accept the use of GAI tools in summative assessment by students, as long as that students utilise such tools responsibly. The findings from sections 4.3 and 4.4 significantly contribute to informing HE policy regarding the responsible use of GAI tools. Through these results, the research unveils two pivotal concepts – responsibility and trust – both of which are integral in shaping future HE policies.

This research recognises that, amid the current paucity of guidelines on the responsible use of GAI tools in summative assessments, it is challenging to clearly define responsible usage and subsequently hold students accountable. These two elements are essential to establish responsibility: without clear duties and obligations, agents (the students) cannot be held accountable for their actions (McGrath & Whitty, 2018). Similarly, without clear consequences for irresponsible actions, accountability is unattainable (Dunn et al., 2021). Therefore, a responsible use of GAI tools in HE requires the development of clear guidelines and policies that set standards for fairness, transparency, and acceptable use, as well as the implementation of penalties for irresponsible usage. However, as responsibility is an evolving and dynamic concept (Rowe et al., 2023), such ramifications cannot simply be imposed on students, teachers, or administrators. Rather, they should be co-created by all stakeholders. The findings

reveal a wide range of perceptions among teachers, and similarly, diverse views among other involved parties could be stipulated. Therefore, responsible use of GAI tools in HE is not a straightforward concept, but rather depends on a multitude of perspectives that need to be negotiated as stakeholders arrive at shared notions of responsibility.

Secondly, this study contributes to the discourse of trust. Even with clear guidelines and policies for the responsible use of GAI tools, the issue of trust remains. Namely, teachers in this study implied that they did not trust students to use GAI tools responsibly. This raises an important question regarding the role of trust in using GAI tools responsibly. As trust is usually founded on non-codified notions, such as norms, habits, culture, and expectations (Faulkner, 2010), building trust differs from developing and implementing rules and policies. With the novelty of GAI tools and its potential significant impact on HE, a lack of trust is evident. This lack of trust is further exacerbated by the fact that GAI tools evolve more rapidly than the ramifications for responsible usage. This situation presents opportunities for research and practice to develop sufficiently elastic and dynamic methods to foster the necessary trust to support responsibility in GAI tools usage. Such attempts require further investigation into teachers' perceptions and, specifically, into the ways in which trustworthiness can be increased.

5.2 Limitations and Future Work

One limitation of this study is the limited number of respondents who participated in the survey, despite the exploratory nature of the research. In future research, more participants will be recruited to ensure a comprehensive representation of the demographic variations in teachers' perceptions of the responsible use of GAI tools in HE. This includes aspects such as familiarity with and proficiency in using these tools. Moreover, given the rapid advancements in GAI technology, it is crucial to consider the potential risks associated with its usage. The survey could be expanded to address psychological risks, for instance. One potential concern is that the use of GAI tools could lead to a detachment from reality, which may be challenging to detect and mitigate.

Future research will delve deeper into the concepts of responsibility and trust, particularly from a sociotechnical perspective. This could inform the development of hypotheses that can be tested to enrich understanding of these complex and multifaceted concepts. By increasing the sample size, more analyses can be conducted, comparing

teachers' perceptions across a range of demographics such as age, gender, and teaching domain. Moreover, from a cross-cultural perspective, further research could investigate how cultural differences affect teachers' expectations regarding students' learning and behaviours. This could shed light on the ways in which cultural norms and values shape teachers' perceptions of responsibility and trust in the context of GAI tool usage. Such insights would be invaluable in developing culturally sensitive guidelines and policies for the responsible use of GAI tools in HE.

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