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Assessment Reform in Higher Education: An Ethical Approach to Harness the Power of Generative Artificial Intelligence

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The emergence of Generative Artificial Intelligence (GenAI) has reshaped higher education with both promising opportunities and significant challenges. Yet little is known about how global educational policies are evolving to address the assessment challenges posed by GenAI in terms of 'ethical considerations.' Additionally, current research has yet to thoroughly pinpoint potential pitfalls in existing policy areas that require further policy development attention. This review seeks to fill this gap by reviewing the existing literature over the last three years since GenAI's emergence, focusing on ethical guidelines in assessment. It also aims to offer policy recommendations to address these issues through this central research question: "What ethical guidelines can be established to leverage generative AI in higher education assessment while ensuring academic honesty and reconsidering the concept of academic integrity?" We followed PRISMA to select articles for this literature review. This review revealed that GenAI has greatly impacted assessment in three main ways: disrupting traditional ways of assessment, raising concerns about academic integrity and ethics, and necessitating the urgent need for a clear ethical framework for the responsible and productive usage of GenAI in the higher education context. This review also offers four critical insights into the existing research on policies: advocate for assessment strategies in adapting policies to encourage the ethical usage of GenAI, consider that reliance on AI detectors is inadequate, reconsider 'originality' and 'academic integrity' in the context of the GenAI era, and suggest frameworks to establish ethical guidance.

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Introduction

The emergence of Generative Artificial Intelligence (GenAI) has reshaped higher education with both promising opportunities and significant challenges (Australian Tertiary Education Quality and Standards Agency, 2023; Cotton et al., 2024; 2024; Nguyen Thanh et al., 2023). While the existing literature has addressed various facets of GenAI in higher education, such as its potential applications, impacts, university policies, and policy framework recommendations (Ray, 2023; Verma et al., 2023), there remains a notable gap in comprehensively analysing how global educational policies are evolving to address the assessment challenges posed by GenAI in terms of 'ethical considerations.' Additionally, current research has yet to thoroughly pinpoint potential pitfalls in existing policy areas that require further policy development attention.

This article seeks to fill this gap by reviewing the existing literature and offering policy recommendations to address these issues through this central research question: "What ethical guidelines can be established to leverage GenAI in higher education assessment while ensuring academic honesty and reconsidering the concept of academic integrity?" Three sub-research questions are: (i) How has GenAI transformed assessment in higher education? (ii) How have policies worldwide addressed the unprecedented changes brought by the emergence and integration of GenAI in higher education assessment? and (iii) How have research worldwide discussed these policies?

Ethical considerations and academic integrity issues are the most frequently mentioned concerns that have emerged in tertiary education since the publication of ChatGPT and subsequent generative AI-based tools (Almasri, 2024; Ansari et al., 2024; Batista et al., 2024; Brandão et al., 2024; Mittal et al., 2024; Ogunleye et al., 2024b; Ray, 2023; Weng et al., 2024; Xia et al., 2024). There has been an ongoing debate and controversial perspectives regarding whether using GenAI in higher education is academic misconduct or a transformative force for reform (Yusuf et al., 2024), whether GenAI should be banned in academically submitted work or should be encouraged with clear

guidance and firm boundaries to ensure the academic integrity (Licht, 2024; Weng et al., 2024; Xiao et al., 2023). Although a wealth of research on GenAI in higher education, in general, has been conducted, the fact is that GenAI has constantly been evolving. Therefore, there needs to be a more comprehensive analysis of how GenAI has created the urgent need to reform higher education assessment.

This article aims to contribute a critical analysis to this ongoing discussion surrounding ethical issues and academic integrity in tertiary education assessment and how higher education can develop a flexible ethical framework to foster assessment innovation and promote responsible usage of technological advancements while redefining and upholding academic integrity in the evolving digital landscape. To address these concerns, this article reviewed and analysed the frameworks developed by researchers for the ethical and responsible usage of GenAI in higher education and assessment (Furze et al., 2024; Hack, 2024; Perkins et al., 2024). These proposed ethical frameworks could guide universities in crafting policies to train students and staff in responsible GenAI usage, help educators design assessments that integrate AI responsibly, and prepare students for AI-driven workplaces. By addressing these challenges, the frameworks aim to foster innovation in assessment while upholding the core values of academic integrity.

Methodology

We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to select articles for this literature review. This review focuses on peer-reviewed studies on GenAI and higher education assessment, written in English and conducted in the past three years since the release of ChatGPT in November 2022. This review focuses on English-language studies, limiting perspectives from non-English-speaking countries, intending to provide insights into these focused educational contexts.

To find the most significant and relevant literature from a global perspective, we applied the search strings to three commonly used digital academic databases related to technology in education: ERIC, Scopus,

and Web of Science. The search strings were formulated with synonyms or alternate terms for each keyword. They employed a boolean logic as follows: ("generative artificial intelligence" OR "generative AI" OR ChatGPT OR GenAI OR "AI tools") AND (assess* OR evaluate*) AND ("higher education" OR universit* OR "tertiary education") AND (ethic* OR "academic integrity" OR "academic misconduct"). Along with PRISMA, to identify key studies of this research topic, we employed the snowballing method by tracing references in previously selected journal articles (backward snowballing) and examining all the articles that cite these included studies (forward snowballing).

Both rounds of screening were involved to enhance the rigour of the selected literature. Initial screening of titles and abstracts was applied to identify the most relevant papers on GenAI and assessment in higher education, followed by full-text screening to select the articles that directly answer the three research sub-questions. This study then used thematic coding and analysis and synthesised the findings to answer three research sub-questions. A hybrid approach to thematic coding was adopted, combining deductive and inductive methods. The three research sub-questions guided deductive coding as three big themes, which means the research questions were kept in mind when analysing and coding the relevant findings from reviewed articles to answer the questions. Inductive coding is conducted to synthesise the codings into sub-themes based on the emerging codes within the three big themes. For example, with the first big theme in mind, regarding how GenAI has transformed higher education assessment, we read, took notes and analysed the transformative effects of GenAI on assessment. Subsequently, to capture the insights into this research question, we revisited all the codes and identified the emerging sub-themes, such as disruptive impacts on traditional assessment methods, ethical considerations and the need for clear guidance on responsible usage.

Findings

The Transformative Impact of GenAI on Higher Education Assessment

This section addresses the first research sub-question, "How has GenAI transformed assessment in higher education?" A comprehensive analysis of selected articles revealed that the advent of GenAI in higher education has constantly transformed assessment designs in tertiary education. GenAI offers potential opportunities while simultaneously bringing forth a set of significant challenges to assessment in three main ways: (i) disrupting traditional ways of assessment, (ii) raising concerns about academic integrity and ethics, and (iii) creating the urgent need for a clear ethical framework for responsible and productive usage of GenAI in assessment within the higher education context.

Disrupting traditional ways of assessment

The research found that the increased usage of GenAI in student work has had a disruptive effect on the sustainability of traditional ways of assessment, such as coding and written essays (Kizilcec et al., 2024; Ogunleye et al., 2024a). GenAI has significantly disrupted traditional assessment approaches two-fold. First, the integration of GenAI in higher education exposes and exacerbates the weaknesses of these conventional assessment methods (Australian Tertiary Education Quality and Standards Agency, 2023; Ogunleye et al., 2024a; Xia et al., 2024). Secondly, GenAI also reveals the mismatch between the old ways of assessment design and the new emerging innovative learning approaches in the GenAI era (Khlaif et al., 2024; Nguyen Thanh et al., 2023; Smolansky et al., 2023; Weng et al., 2024; Xia et al., 2024).

Revealing the weaknesses of traditional assessment methods

Traditional assessment approaches in higher education have various limitations: manual, time-consuming and limited teacher resources (Broadbent, 2017; Knight & Drysdale, 2020; Penny & Coe, 2004) cited in (Xia et al., 2024)). The emergence of GenAI has added more challenges to these methods because GenAI can easily aid students in completing take-home assessment tasks. Therefore, these methods have failed to accurately assess students' actual effort and learning outcomes

as they have inadequately responded to the implications of GenAI in students' work (Khlaif et al., 2024; Xia et al., 2024; Yusuf et al., 2024).

Australian Tertiary Education Quality and Standards Agency (2023) also states that GenAI brings various risks to traditional assessment. First, GenAI acts as a threat to traditional assessment practices because academic integrity emerges as a huge concern when students can quickly adopt GenAI to produce their submitted work, calling into question their personal learning attainment. Secondly, GenAI and students' ability to use these tools continue to evolve, teachers and AI detectors sometimes fail to distinguish between the student's work and GenAI-produced work. Thirdly, non-invigilated assessment tasks face many challenges in precluding the use of GenAI.

A mismatch between traditional approaches to assessment and innovative learning outcomes

Traditional methods in higher education assessment do not operate effectively in the context of the GenAI era. A scoping review conducted by Weng et al. (2024) identified the new focused learning outcomes in the evolving AI-facilitated educational contexts, such as career-driven competencies (e.g. AI literacy and critical literacy) and lifelong learning skills (e.g. higher-order thinking skills and emotional competencies). The review argued a mismatch between the new focused learning outcomes that evolved from integrating GenAI in teaching and learning and the traditional knowledge-based assessment methods. The review highlighted that the ultimate goal of assessment is to enhance the quality of the learning and teaching process and prepare students for the future workforce. Therefore, assessment designs must be matched with the growing integration of technological advances in the learning process to facilitate innovation in higher education and obtain student assessment goals. This scoping review also identified three assessment approaches: (i) traditional, (ii) innovative and refocused, and (iii) GenAI-incorporated. It also argued that assessment and learning outcomes are intertwined, assessment drives new learning outcomes, and the new learning outcomes call for assessment redesign.

Similarly, a study by Nguyen Thanh et al. (2023) used Bloom's Taxonomy as a structured framework, and its findings underscored the

cultivation of higher-order thinking skills and creativity in student learning outcomes goals. They also argue that the existing curriculum needs to be revised to prepare graduates for new learning outcomes in the GenAI context, such as creativity and critical thinking. In addition, Ogunleye et al. (2024a) suggest that the higher education sector incorporates GenAI literacy and critical thinking skills into the curriculum as new content to support students' critical engagement with GenAI tools and assessment.

Raising concerns about academic integrity and ethics

Academic integrity and ethical considerations regarding the use of GenAI in students' work have become pressing concerns for university sector policymakers and stakeholders (Cotton et al., 2024; Dotan et al., 2024; McDonald et al., 2024; Perkins, 2023). Nguyen et al. (2022) investigated international organisations' current policies and guidelines on ethical considerations of AI in education, proposing a set of ethical principles for AI in education, including (i) principle of governance and stewardship, (ii) principle of transparency and accountability, (iii) principle of sustainability and proportionality, (iv) principle of privacy, (v) principle of security and safety, (vi) principle of inclusiveness and (vii) principle of human-centred AI in education. However, this review identifies transparency and accountability (principle ii) as the focal point of ethical considerations in the context of GenAI and assessment. This focal point stems from the predominant concern in existing policies: the potential misuse of GenAI tools, which compromises academic integrity in students' submitted work.

The disruptive effects of GenAI on assessment have led to the primary concern mainly being associated with ethical usage and academic integrity, such as academic dishonesty and plagiarism (Anders, 2023; Cotton et al., 2024). GenAI tools can generate a written eloquent essay and code in various languages, all in one go with specific prompts that necessitate the establishment of clear ethical guidelines for both teachers and students to avoid academic dishonesty (Gorichanaz, 2023; Kizilcec et al., 2024). Nonetheless, research has found gaps and ambiguities in existing policies that address the emergent issues of GenAI in assessment. For example, Sok and Heng (2024) discussed the policy in the Cambodia higher education context, arguing that the emergence of GenAI tools,

such as ChatGPT, Google's Gemini and Microsoft's Copilot, has led to the increase in academic misconduct and complex the nature of plagiarism. However, Sok and Heng claimed that the specific policy guidance at the university level seems to fall behind the complexity of academic dishonesty in the GenAI era, resulting in unethical and misuse of GenAI in assessment. Therefore, they discussed the requirement for developing and revising GenAI-related academic integrity and ethics policies to encourage the informed, ethical and responsible usage of GenAI for student assessment practice across universities.

The need for clear guidance on GenAI usage in student assessments
Research has been conducted to explore the use of GenAI tools among students and staff, and their feedback reveals that students are excited to use GenAI tools yet confused and unclear about what is acceptable usage of GenAI (Chan & Hu, 2023; Gorichanaz, 2023; Kizilcec et al., 2024; Kutty et al., 2024; Rajabi et al., 2024; Smolansky et al., 2023; Wang, 2024). These findings exemplify the need for the university sector to offer clear guidance on the ethical usage of GenAI and the importance of communicating with students and incorporating students' perspectives in the policy-making process.

Farhi et al.'s (2023) research, for example, explored the perspectives of 388 students in the United Arab Emirates (UAE) towards ChatGPT usage and found that students favour employing ChatGPT and consider it a revolutionary technology that benefits them in many aspects of the learning process, such as 'an indispensable writing aid'. However, they also express concerns about potential over-reliance on this GenAI tool. The findings highlighted the potential to impact students' critical thinking and creative writing skills negatively. Similarly, Freeman (2024) investigated 1,250 UK undergraduate students' attitudes to ChatGPT and found that over half of students are using ChatGPT in their academic assessment but 35% of students are not aware of its potential errors such as bias or incorrect information, 62% of students are unsure about the guidance from their university and around 73% of students expect to continue using AI tools after their graduation.

The finding necessitates clear guidance from the university sector to equip their students to become informed and responsible users of GenAI.

Instead of punishing, the study suggested that the university should provide training for students on how to use it ethically and effectively. They also argue that the growing threat to assessment practices presented an urgent need for national policymakers to commission a review on how to respond to GenAI challenges in assessment as reliance on AI detectors and punishment approach only are inadequate. The study of Rajabi et al. (2024) captured the perspectives of students and faculty members in Canada and revealed that despite diverse opinions about incorporating ChatGPT in higher education, a consensus was that GenAI tools would be inevitably employed by students regardless of the permission of the course instructors.

These studies contribute to the ongoing argument of the need for specific and clear guidelines and compulsory transparent reporting of GenAI usage. To seize this opportunity for innovation in assessment, it is crucial to examine how policymakers and the university sector worldwide address these challenges to assessment and outline directions for assessment reform.

Global Policy Responses to GenAI and Assessment in Higher Education

This section focuses on addressing the second sub-research question, "How have policies worldwide addressed the unprecedented changes brought by the emergence and integration of GenAI in higher education assessment?" It explores research findings related to higher education policies concerning GenAI and assessment, particularly scrutinising the existing policies to address the ethical considerations of GenAI usage in student work.

The disruptive nature of GenAI tools in higher education assessment has led to calls for the university sector to develop comprehensive and easy-to-understand guidelines to pertain to its usage, such as instructions on the proper use of these tools and the consequence of cheating (Moorhouse et al., 2023). Two main approaches to this issue are applied by universities worldwide: (i) banning the use of GenAI tools in their academic programmes and considering GenAI usage as cheating, and (ii) embracing GenAI tools with clear guidance and request for declaration and transparent acknowledgement of GenAI usages.

Banning approach

The reasons for the prohibition of GenAI are mainly associated with (i) academic integrity, (ii) a concern of over-reliance on GenAI, which has led to a decline in students' critical thinking skills, and (iii) inequity in access to GenAI tools will reinforce digital inequalities as lower socio-economic students do not have equal access as the social-economically advantaged students (Ansari et al., 2024; Batista et al., 2024; Chan, 2023; Moorhouse et al., 2023).

These universities take three approaches to prevent academic dishonesty: prevention, detection and modifying assessment designs as invigilated assessment tasks. Prevention seems not to keep up with the technological advances and fails to prepare their undergraduates for the future work landscape (Ansari et al., 2024; Batista et al., 2024; Cacho, 2024). AI detection tools commonly used by universities are iThenticate, Turnitin, ZeroGPT, GPTZero, and Winston. However, these tools are being questioned about their inaccuracy and reliability (Gorichanaz, 2023; Moorhouse et al., 2023; Sok & Heng, 2024; Xiao et al., 2023). The redesign of 'take-home assessments' to 'in-class assessments' and invigilated assessment tasks will add more challenges to traditional approaches as it exacerbates the problems of being time-consuming and resource-limited (Moorhouse et al., 2023). Studies on the utilisation of GenAI tools among university students also revealed the complex nature of assessment in the GenAI era, which confirms that banning policies are oversimplified (Chan & Hu, 2023; Farhi et al., 2023; Freeman, 2024; Gorichanaz, 2023; Rajabi et al., 2024).

Embracing approach

Universities worldwide are increasingly altering their policies on GenAI, moving from initial prohibition to embracing the use of GenAI tools in student assessment with clear guidance to foster their ethical, responsible, and transparent use. Moorhouse et al. (2023) examined policies on 'GenAI and assessment' from the world's top 50 universities, identifying a transition from reactive to responsive policies by the collaboration of various stakeholders in developing ethical guidelines to address the inevitable growing integration of GenAI in teaching and learning. In addition, Luo's critical review (2024) of policies regarding GenAI and higher education assessment also noted a global trend in the policy

development process: With the growing understanding of GenAI, many universities tend to review and rethink their policies to foster responsible and ethical use of GenAI. Prohibition policies of GenAI usage in the university sector have been criticised as counterproductive and unsustainable for cultivating and preparing an AI-literate workforce (Sullivan, Kelly, and McLaughlan 2023, cited in Luo (2024). Similarly, Xiao et al. (2023) examined ChatGPT policies from the top 500 universities, finding that only around 30% of these universities have guidance on ChatGPT, with two-thirds of those endorsing its ethical and responsible use.

Australian Tertiary Education Quality and Standards Agency (TEQSA) (2023) made a strong argument about why we should support the use of GenAI in assessment rather than ban it. First, the guidance on assessment reform states that GenAI brings opportunities and risks for higher education assessment as it acts as a catalyst for reform. However, the guidelines draw on experts' expertise and outline directions for the future of assessment so that assessment practices can manage the risks and challenges to take advantage of the opportunities of GenAI in higher education reform:

> There is little value in ignoring AI or implementing blanket bans on particular tools or technologies. These are oversimplified solutions to a complex set of problems and overlook what is already known about good assessment practice. As AI use becomes commonplace across schools and workplaces, it will be increasingly important to consider how these tools are integrated into learning and teaching in higher education in intelligent ways (p. 2).

Australian TEQSA set two guiding principles as a 'compass' to future assessment designs as follows:

(i) Assessment and learning experiences equip students to participate ethically and actively in a society where AI is ubiquitous.

(ii) Forming trustworthy judgements about student learning in a time of AI requires multiple, inclusive and contextualised approaches to assessment.

These principles emphasise the need to reconsider the complex nature of assessment and students' rights to 'be partners' in their learning. Students will benefit the most if the ethical, responsible, critical and productive ways of engagement with GenAI in the learning process have been taught in tertiary education. These principles also call for an interdisciplinary collaboration of assessment design. They also highlight that the ultimate goal of assessment is to enhance the quality of students' learning experience and assure student learning attainment, readying them for their future work market, where they will engage with GenAI tools to boost their work productivity and their ability to work with genA has rapidly become critical in the workplace.

Similarly, 'collaboration, coordination, and consistency' is one of the core principles that the Russell Group of 24 universities in the UK underlines (Russell Group, 2023). They have also recognised the leadership roles of the university sector to address these issues, and they have collaboratively developed the five principles to guide ethical and responsible usage of GenAI as follows:

(i) Universities will support students and staff to become AI-literate.
(ii) Staff should be equipped to support students to use generative AI tools effectively and appropriately in their learning experience.
(iii) Universities will adapt teaching and assessment to incorporate the ethical use of generative AI and support equal access.
(iv) Universities will ensure academic rigour and integrity is upheld.
(v) Universities will work collaboratively to share best practices as the technology and its application in education evolves (Russell Group, 2023, p. 1).

Australian TEQSA and 24 Russell Group universities acknowledge that GenAI is becoming ubiquitous worldwide and in the workplace. Ignoring or banning GenAI is an oversimplified solution that ignores the nature of good assessment. Thus, the university sector should support their students and staff in becoming AI literate and responsible and ethical users of GenAI. In addition, the university sector needs to promulgate policies to reform and redesign assessment practices to align with the evolution of technologies and GenAI.

In conclusion, GenAI appears as a transformative force of reform and presents accelerated calls for guidance on its usage in tertiary education worldwide. The research found that some guidance is still unclear, so we need more understanding and revisiting of the policies.

Global Research Perspectives on Policies for GenAI in Higher Education Assessment

This section investigates the third sub-research question, "How have research worldwide discussed these policies?" It synthesised the research findings in examining the existing policies into four main points: (i) advocating for the assessment strategies in adapting policies to encourage the ethical usage of GenAI is more realistic than simply banning, (ii) relying solely on the AI detectors is inadequate, (iii) reconsidering 'originality' and 'academic integrity' in the context of GenAI era, and (iv) suggesting frameworks to establish the ethical guidance.

The advocacy of the ethical usage of GenAI in students' work

GenAI has been considered a transformative driven force that higher education can benefit in teaching and learning as it brings a paradigm shift in higher education (Jin et al., 2024; O'Dea, 2023). The central question is how to develop new assessment approaches to balance the opportunities of leveraging the benefits of GenAI in assessment while maintaining and upholding academic integrity (Kizilcec et al., 2024). This paradigm shift may require the development of new assessment approaches and policies that achieve a balance between the advantages of AI and the imperative to maintain academic integrity.

Various research has been conducted to assess GenAI's capabilities in assessment tasks (Beynen, 2024; Furze et al., 2024; Huang et al., 2024;

Nguyen Thanh et al., 2023; Ogunleye et al., 2024a; Wang, 2024; Xu et al., 2024; Zainurrahman et al., 2024) and found that we can use GenAI support to develop students' AI, assessment, and critical literacy. For example, a study by Nguyen Thanh and colleagues (2023) aimed to fill the gap in understanding how GenAI impacts assessment so that higher education can redesign assessments in a way that can reduce students' over-reliance on GenAI tools while fostering students' skills in employing GenAI. By evaluating the effectiveness of GenAI tools through the lens of Bloom's taxonomy, they found that GenAI tools perform differently at different levels of taxonomy, very well at the lower levels, decent at the higher levels, very weak at the 'create" level. The findings called for a concerted effort to revise student learning outcomes, focusing on higher levels of Bloom's Taxonomy. In addition, Huang et al. (2024) studied the roles of GenAI tools in individual formative e-assessments and found that these tools in assessment can develop students' critical thinking and information evaluation skills. These studies then come to a similar argument about the need for policymakers to keep a balanced approach to harness the power of GenAI tools in assessment while ensuring ethical principles and academic integrity.

Research examining various stakeholders in higher education also revealed the importance of fostering students' AI and critical literacy (Chan & Hu, 2023; Chiu, 2024; Dotan et al., 2024; Lee et al., 2024; Smolansky et al., 2023; Xu et al., 2024). For example, a study by Chiu (2024), based on the perspectives of 51 students from three universities, suggested the need to train students with skills in using GenAI tools to become future-ready for 'employment in a society powered by GenAI.' This study also highlighted the importance of assessment redesign, which focuses on hands-on activities. Lodge et al. (2023) and Tang et al. (2024) supported GenAI usage by developing clear guidelines and firm boundaries on transparency in academic research, however, their examples of transparency can be used as a clear guidance of how to acknowledge the usage of GenAI. Lodge et al. (2023) as the editorial team of the Australasian Journal of Educational Technology (AJET) stated in the acknowledgment of their article as follows: "ChatGPT was used to generate ideas for the writing of this editorial" (Lodge et al., 2023, p. 6). In a similar vein, Tang et al. (2024) offered the disclosure of GenAI

usage in their manuscript: "As noted earlier, we offer the example of our own use of GenAI tools in the preparation of the current paper:

- The GenAI application and version (e.g., ChatGPT 4o)
- The period of use (May and June 2024)
- Justification (enhancing clarity of language)
- Prompts/input (ChatGPT prompt: rewrite: [paste sentence])
- Authors' review and acknowledgment of responsibility: (e.g., We acknowledge that the authors have carefully reviewed and edited the manuscript and take full responsibility for the text).

Such disclosures should be included in the Methods section of the manuscript. The declaration of such use represents an open and ethical approach." (Tang et al., 2024, p. 802).

In conclusion, a wealth of research supports the ethical usage of GenAI while upholding academic integrity. At the same time, when scrutinising the existing policies, other research found two main potential pitfalls that require more attention from the policy-makers: (i) the caution of using AI detection tools as a standalone solution and (ii) the call to reconsider student work's originality and revise the concept of 'academic integrity'.

Reliance on AI detectors is inadequate.

The reviewed literature discusses the limitations of AI detector tools and underscores the inadequacy of relying solely on it (Ardito, 2024; Gorichanaz, 2023; Perkins et al., 2024). Despite their prevalence, these tools are often inaccurate and can lead to unfair evaluations. This insight highlights the need for broader strategies that focus on fostering authenticity in assessments rather than punitive measures.

The research raised huge concerns about policies relying only on AI detector tools for two main arguments (Ardito, 2024; Moorhouse et al., 2023; Ogunleye et al., 2024b). First, AI detector tools are not 100% accurate, and second, punishing the usage in submitted work is not a long-term, forward-thinking solution (Cotton et al., 2024; Perkins et al., 2024). For example, Gorichanaz's research (2023) focused on the students' perspectives, arguing that AI detector tools are unreliable and students are not satisfied with the approaches of using AI detector tools in

assessing their work. In addition, Ardito (2024) scrutinised the effectiveness of AI detector tools and argued that reliance on detection mechanisms is misaligned with the nature of the educational landscape where GenAI becomes imperative in studying and working. The study suggested a strategic shift toward educational policies that embrace authenticity in assessments and ensure academic integrity in the GenAI era.

Reconsidering the 'originality' of students' work and the concept of 'academic integrity' in the context of the GenAI era

In the context that the usage of GenAI tools has been increasingly popular in the workplace, some studies raise the question of revisiting the nature of the 'originality' of students' work (Eaton, 2024; Farrelly & Baker, 2023; Kizilcec et al., 2024; Luo, 2024; Tang et al., 2024). These studies emphasised that GenAI emergence has complicated and questioned the traditional understanding of two concepts 'originality' of students' work and 'academic integrity' in higher education. For example, Tang et al. (2024) and Eaton (2024) underscored the reality of the collaborative nature of knowledge production between humans and GenAI in this digital landscape and called for a shift in recognising the contribution of the ethical usage of GenAI students' efforts in submitting their work.

Among these studies, a critical review by Luo (2024) offered a clear perspective on reconsidering the 'originality' of student work. The review addressed the research question, "What is the major problem represented to be in university policies on the use of GenAI in assessment?". Using the WPR framework (What's Problem Represented to be?) as a paradigm, Luo questioned the current policies regarding considering GenAI as an external assistance and separated from students' efforts. The main argument is that with the increasing emergence of knowledge production as a collaborative effort when humans work with GenAI, it is time to revisit the concepts of 'academic integrity' and 'originality' of student work. Perkins (2023) suggested that students' usage of AI tools is not equal to academic misconduct if the students make the usage clear. Perkins et al. (2024) argued that the discourse that 'GenAI-generated content as academic misconduct' is problematic as clear evidence that many leading academic journal publishers permit the responsible usage of GenAI in refining and improving the manuscripts.

Suggested frameworks to establish ethical guidance

To address these dilemmas in higher education in ensuring ethical considerations for academic integrity and leveraging the advantages of GenAI tools in higher education, various research worldwide contribute to establishing realistic frameworks for responsible usage of GenAI in higher education and assessment (Cha et al., 2024; Chan, 2023; Chiu et al., 2024; Nguyen Thanh et al., 2023; Perkins et al., 2024; Radwan & Mcginty, 2024; Smith et al., 2024; Su & Yang, 2023). While these frameworks serve as valuable references to establish ethical guidance of GenAI usage in tertiary education assessment, this section chooses to examine the two most relevant frameworks in terms of assessment: the AIAS framework (Furze et al., 2024; Perkins et al., 2024) and the I.D.E.As framework (Hack, 2024).

(1) The AIAS framework

Perkins et al. (2024) and Furze et al. (2024) supported the ethical usage of GenAI in student assessments in alignment with a call to revise the concept of 'academic integrity' in the GenAI era and proposed the Artificial Intelligence Assessment Scale (AIAS) framework with three goals: (i) help educators consider how to adjust their assessments in light of GenAI tools, (ii) offer clear boundaries for students on how and where GenAI tools might be used in their submitted work, and (iii) support students in completing assessment task in line with academic integrity principles. The framework is adapted and reported as follows:

Table 1: The AI Assessment Scale, adapted from its original table (Perkins et al., 2024)

No.	Scale Levels	Descriptions
1	NO AI	The assessment is completed entirely without AI assistance. This level ensures students rely solely on their knowledge, understanding, and skills. **AI must not be used at any point during the assessment.**
2	AI-ASSISTED IDEA GENERATION AND STRUCTURING	AI can be used for brainstorming, creating structures, and generating ideas for improving work. **No AI content is allowed in the final submission.**

3	AI-ASSISTED EDITING	AI can be used to make improvements to the clarity or quality of student-created work to enhance the final output, but no new content can be created using AI. **Original work with no AI content must be provided in an appendix.**
4	AI TASK COMPLETION, HUMAN EVALUATION	AI is used to complete certain elements of the task, with students providing discussion or commentary on AI-generated content. This level requires critical engagement with AI output. **AI-created content must be cited in the assessment.**
5	FULL AI	AI is used as a "co-pilot" to meet the requirements of the assessment, enabling a collaborative approach and enhancing creativity. **AI may be used throughout the assessment without specifying which content is AI-generated.**

(2) The I.D.E.As framework

Hack (2024) developed the Introducing, Developing, Empowering and Assessments (I.D.E.As) framework to explore ways that GenAI tools can be used as a 'force for good' in supporting and enhancing students' learning experience as independent learners.

Table 2: The I.D.E.As framework, adapted from its original table (Hack, 2024, p. 2).

The I.D.E.As framework		
Introducing	Developing and Empowering	Assessments
Activities which: • Foster early critical thinking and critical engagement with (Gen)AI • Emphasise importance of how use AI tools	Activities which: • Support students in their learning journey (independent learners) • Support students' engagement with assessment (assessment literacy)	Activities which: • Assessment design • Guidance for students • Transparency of use (students)

This framework focuses on supporting students with AI and assessment literacy to guide them in using GenAI tools in their learning and assessment processes. The author also argues that this framework can be seen as a starting point for developing a more comprehensive ethical framework.

In conclusion, these two frameworks can assist policymakers in developing ethical guidelines for assessment reform in higher education. They highlight the transparency and accoutability in GenAI usage which are critical to address ethical considerations and to redesign assessment policies. Clear ethical frameworks can empower university educators and students to leverage the advantages of technological evolution while protecting academic integrity in students' work.

Discussion

This review of GenAI and ethical considerations in higher education assessment provides four critical insights from the existing research on policies: the need for assessment redesigns to support ethical usage, the insufficiency of relying solely on AI detectors, the necessity of revising and redefining 'originality' and 'academic integrity' in the context of the GenAI era, and the importance of developing GenAI frameworks to establish ethical guidance. This review aims to examine higher education policy responses to GenAI and assessment, particularly highlighting ethical considerations. However, to effectively transform assessment in higher education, this current review suggests an ecological approach to assessment reform, encompassing other key interconnected aspects of higher education: governance, curriculum, pedagogy, and teacher education.

The above recommendation aligns with the findings from the existing research. Chan (2023) developed an AI Ecological Education Policy Framework to address the multifaceted responsibilities and implications of integrating AI at the university level. This framework is based on the findings of a mixed-methods study exploring the perspectives of 180 teachers, staff, and 457 undergraduate and postgraduate students in Hong Kong universities. It has three dimensions: pedagogical (teachers),

governance (senior management), and operational (teaching and learning and IT staff). Similarly, Chiu (2024) identified four main educational domains that must be addressed together to successfully transform higher education in the GenAI context: teaching, learning, assessment and administration. University stakeholders, including leaders, educators, students and administration staff, have not previously been exposed to GenAI integration. However, GenAI has presented challenges and opportunities to reform and advance future tertiary education for a future GenAI-driven workforce. Therefore, Chiu's research calls for a collaborative and interdisciplinary approach to addressing this phenomenon.

Teacher education is one of the key components in higher education assessment reform in the GenAI era (Brandão et al., 2024; Cha et al., 2024; Eaton, 2024; Estaiteyeh & McQuirter, 2024; Khlaif et al., 2024; Lindade, 2024; Nyaaba & Zhai, 2024; Radwan & Mcginty, 2024; Verma et al., 2023). For example, Cha and colleagues' research (2024) highlighted the importance of teacher education and proposed a Competency Framework to empower university educators to guide and support students in GenAI-enabled teaching and learning. Brandão et al. (2024) argued that AI literacy should become one of the key components in teacher education, both pre-service and in-service. Additionally, they argue that hands-on training activities should be provided to engage educators and students critically during the training process. Xia et al. (2024) also emphasised the need for higher education institutions to reevaluate and redesign assessment policies, offer professional development programs focused on assessment, AI, and digital literacy for university educators, and foster more interdisciplinary programs and teaching approaches.

Researchers have also critically discussed tertiary education curriculum innovation that integrates assessment literacy, AI literacy, and critical thinking skills. Beynen (2024) found that developing students' assessment literacies will enhance academic integrity in the GenAI context. Chiu and Sanusi (2024) highlighted that AI literacy and competency training benefit both teachers and students, enabling them to harness GenAI in teaching and learning with confidence, proficiency, and responsibility. Nguyen Thanh and colleagues (2023) argued for reimagining and redesigning the learning goals and content, focusing on

higher cognitive skills, skills rather than knowledge, focusing on preparing students for their future labour market where GenAI cannot replace them; on the contrary, graduates can harness the power of AI to accelerate the work process much productively and quickly.

The findings from this review contribute to identifying potential directions for future policy development in higher education assessment, particularly in areas such as academic integrity, ethical considerations, GenAI policy framework and an ecological approach to assessment reform. Further research on the perspectives of diverse stakeholders regarding GenAI usage and assessment is valuable for informing and enhancing policy revising and developing processes related to assessment in higher education to prepare future workforce skills and readiness. In addition, more studies on ethical guidelines are needed to inform the university sector in developing a robust and comprehensive ethical framework for GenAI and assessment.

Conclusions

GenAI has fundamentally reshaped higher education assessment, moving beyond traditional knowledge-based approaches. This paper focuses on the policy development process surrounding GenAI and its implication for assessment at the tertiary level to address the ethical considerations in student assessments. The review reveals that the integration of GenAI has been framed as a transformative force in assessment reform. It highlights three major ways in which GenAI has impacted higher education assessment: disrupting and challenging traditional assessment methods, amplifying concerns around academic integrity and ethical considerations, and underscoring the pressing need for a well-defined ethical framework to ensure its responsible and effective application.

GenAI emerges as both a catalyst for assessment reform and a driver for comprehensive transformation across the university sector. While an ethical approach is vital for assessment reform at the tertiary level, it is also argued that an ecological approach should be implemented to reform across tertiary education, including curriculum content and goals (e.g., AI literacy, assessment literacy, and critical thinking), pedagogical practices, and teacher education (both pre-service and in-service professional

development). A more comprehensive analysis is required to understand how GenAI has catalysed the pressing need for higher education assessment reform and rethinking about 'academic integrity' and 'originality' of student work in this GenAI era.

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