

The Use of Generative AI in Higher Education Student Assessments: A Synthesis of Empirical Studies

Chun Meng Tang

James Cook University Singapore, Singapore

chunmeng.tang@jcu.edu.au

Abstract: Generative artificial intelligence (GenAI) has become increasingly common among higher education students as an aid for completing assessments. Although previous studies have examined the implications of GenAI use in assessments, there is a need to synthesise existing findings to better understand how students use GenAI and how it affects their experiences. This study aimed to synthesise empirical research on higher education students' use of GenAI in assessments. Guided by the Population, Exposure, and Outcome (PEO) framework, the study adopted a hybrid deductive and inductive codebook thematic analysis of 14 empirical studies identified through a search of the Education Resources Information Center (ERIC) database. The analysis identified four main themes: uses of GenAI in assessments, perceived benefits of GenAI, challenges and limitations of GenAI, and academic integrity and ethical implications of GenAI. The findings suggest that students use GenAI for writing and content development, research and information support, idea generation and planning, and feedback and assessment support. Participants also perceived several benefits associated with GenAI use, including improved assessment performance, increased efficiency, and enhanced learning support. However, the use of GenAI also presents challenges and limitations, including ineffective use, concerns about accuracy and reliability, and effects of over-reliance on learning skills. In addition, participants expressed concerns about plagiarism and academic misconduct, fairness and academic equity, and the need for transparency and ethical GenAI use. The findings suggest that effective and responsible GenAI use requires institutional guidelines and adequate proficiency in GenAI competencies. This study contributes to the growing literature on GenAI in higher education assessments and provides insights for students, educators, and policymakers on the integration of GenAI into assessment designs.

Keywords: Assessment, Generative AI, Higher Education, PEO Framework, Thematic Analysis

1. Introduction

The launch of ChatGPT by OpenAI in late 2022 provided many students with their first exposure to a generative artificial intelligence (GenAI) tool (OpenAI, 2022). Since then, students have gained access to many other GenAI tools, such as Google Gemini, Anthropic Claude, and Microsoft Copilot, and are increasingly using these tools as an aid to assist with assessment tasks (Kirsanov et al., 2026; Oc et al., 2025), leveraging on their ease of use and ability to quickly generate text, images, videos, and other content (Comscore, 2026; Statista, 2026a). However, the use of GenAI in student assessments, if misused, raises concerns about academic integrity (Akiba and Garte, 2024; Cong-Lem et al., 2024) and over-reliance (Aydeniz, 2025; Chkarka and Fatmi, 2026), which may hinder the development of the knowledge, skills, and attitudes necessary for learning (Xia et al., 2024; Zirar, 2023).

Although some previous studies have examined students' use of GenAI in assessments, they have generally focused on the broader use of GenAI rather than on specific GenAI interventions in specific assessment tasks. Examples of such studies include Biju et al.'s (2024) study on how AI-assisted language assessment influenced second language learners' anxiety, motivation, attitudes, and writing skills; Nikolic et al.'s (2023) study on how ChatGPT affected assessment tasks in engineering education; and Oc et al.'s (2025) study on higher education students' adoption of GenAI tools in coursework. However, examining the general use of GenAI provides limited insight into how students use it to complete specific assessment tasks. Furthermore, findings from previous studies that examined specific applications of GenAI in assessments remain fragmented.

Some previous studies have conducted qualitative reviews and analyses of GenAI use in assessments. Examples include Wangdi et al.'s (2025) qualitative content analysis of 17 articles, which examined the practices and limitations of using ChatGPT for student assessment; Xia et al.'s (2024) scoping review of 32 articles, which examined how GenAI affected higher education assessment at the levels of students, teachers, and institutions; and Zirar's (2023) thematic analysis of 25 articles, which examined how large language models influenced learning and assessment in higher education. However, the existing literature synthesised in these studies primarily focuses on the general use of GenAI and provides limited insight into students' actual use of GenAI in assessments.

This study, therefore, aimed to synthesise findings on how GenAI has affected the ways in which higher education students complete assessments. To achieve this aim, the study searched the digital library of the Education Resources Information Center (ERIC) for empirical studies conducted after the launch of ChatGPT and synthesised their findings using the Population, Exposure, and Outcome (PEO) framework. The synthesis

attempted to identify patterns in aspects such as the types of assessments completed using GenAI tools, how these tools were used, and how their use influenced students' experiences.

This study contributes to the existing body of knowledge by synthesising findings from previous studies to inform students', educators', and policymakers' decisions regarding the use of GenAI in student assessments and the design of student assessments for e-learning environments.

The remaining sections provide an overview of GenAI, its use in education and student assessments, and the PEO framework; describe the research design and method; present the study findings; and conclude with a discussion of the findings.

2. Literature Review

2.1 Generative Artificial Intelligence (GenAI)

Built on models trained on large datasets, GenAI can generate content, including text, images, and videos, based on user prompts and is expected to disrupt a range of industries, from technology to banking (Statista, 2026a; Statista, 2026b). Since the launch of OpenAI's ChatGPT in late 2022, many other GenAI tools have become widely accessible, including Google Gemini, Anthropic Claude, and Microsoft Copilot. The widespread availability of these tools has further accelerated the adoption of GenAI across industries. According to Microsoft's AI diffusion report, GenAI adoption reached 16.3% of the world's population in the second half of 2025 (Microsoft, 2026). The global GenAI market is projected to reach US\$86.70 billion in 2026, with an annual growth rate of 24.83% from 2026 to 2032 (Statista, 2026a).

2.2 GenAI in Education and Student Assessments

The launch of OpenAI's ChatGPT attracted the attention not only of students but also of educators and educational institutions because of its potential implications for teaching and learning. Singh and Ngai (2024) analysed the initial responses of leading US and UK universities to ChatGPT and found that its uses go beyond content generation to include supporting student learning, assisting educators in teaching and assessment design, and fostering skill development such as critical thinking and research. They also highlighted that ChatGPT has the potential to transform or disrupt work practices, support the development of educational materials and assessments, and threaten academic integrity if misused.

Concerning the educational impact of GenAI, Chiu (2024) examined the perspectives of primary and secondary school teachers and leaders. The study identified four main themes: (1) student learning, including AI education, critical reasoning and thinking, digital, media, and information literacies, and generic skills such as problem-solving, communication, and self-directed learning; (2) teacher learning, including AI-integrated curriculum development, teacher AI literacy, new facilitation skills, and interdisciplinary teaching; (3) assessment, including assessment approaches and dimensions of assessment; and (4) administration, including administrative effectiveness and attitudes.

Regarding the use of GenAI in assessment, Xia et al.'s (2024) scoping review summarised that GenAI can affect higher education assessment at the levels of students, teachers, and institutions. At the student level, the study identified three opportunities: perceived unbiased feedback, immediate and diverse feedback, and self-assessment, as well as one key challenge related to academic integrity. At the teacher level, the study identified six impacts: teacher assessment literacy, more diverse and innovative assessment practices, assessment-driven teaching, poor student skill development, teacher beliefs about assessment, and balancing GenAI and human assessment. At the institutional level, the study identified five implications: assessment policies, new literacies and professional development for teachers, shifting educational focus and learning objectives, interdisciplinary assessment, and the disruption of traditional assessment methods.

2.3 The Population, Exposure, and Outcome (PEO) Framework

The PEO framework helps ensure that research questions remain focused and relevant. Population refers to the participants involved in a study, such as individuals, organisations, or groups. Exposure refers to the phenomenon or experience to which the population is exposed, such as an event, policy, or intervention. Outcome refers to the impacts or results of the exposure on the population, such as changes in behaviour or perceptions (van der Walldt, 2025). The PEO framework has been widely used in social science, health, and technology research to examine a range of phenomena, for example, antecedents of involuntary retirement

(MacLean, 2022), air pollution and noise (Mayntz et al., 2024), and digital transformation and Industry 4.0 (Quynh and Buics, 2024).

3. Research Design and Method

3.1 Database and Article Screening

As this study focused on the use of GenAI in higher education student assessments, the ERIC database was selected for its specific coverage of educational literature, rather than broader multidisciplinary databases such as Scopus and Web of Science. Because OpenAI launched ChatGPT on 30 November 2022 (OpenAI, 2022), this study searched the ERIC database for primary empirical studies published in English-language peer-reviewed journals from that date until 12 March 2026, when the search was conducted. The search used a combination of key terms and searched the full text of the articles. Figure 1 presents the search string and article screening criteria.

The search yielded 769 articles. Following an initial screening, this study removed 689 articles that did not match the inclusion criteria and selected 80 articles for full-text screening. The full-text screening process further removed 66 articles. Thus, 14 articles were selected for the thematic analysis.

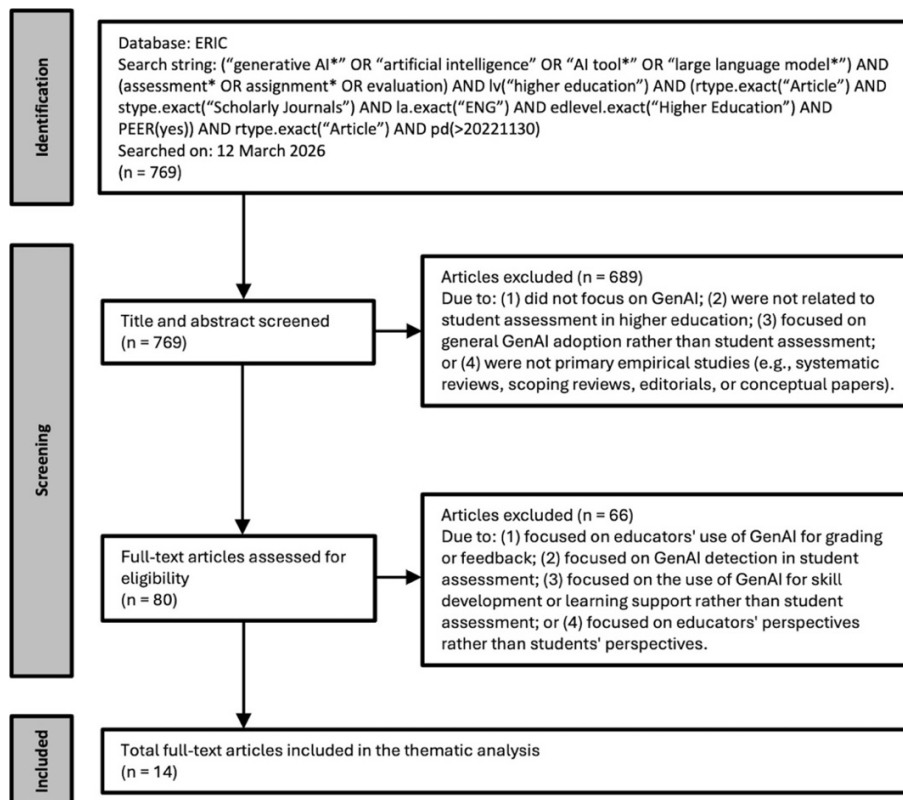


Figure 1: Flow diagram of the screening process (adopted from the PRISMA 2020 statement, Page et al., 2021)

3.2 Data Analysis

This study adopted a hybrid deductive and inductive codebook approach to thematic analysis (see Braun and Clarke, 2022). The 14 articles selected through the full-text screening process formed the dataset for the analysis. To maintain consistency, the same coder performed all coding throughout the analysis using QualCoder 3.8.2 (Curtain et al., 2025).

The study used the a priori PEO framework in a deductive approach to guide the analysis, i.e., population (higher education students), exposure (GenAI tools), and outcomes (students' experiences associated with GenAI use). Because the analysis focused on how the use of GenAI tools influenced students' experiences, the coder adopted an inductive approach to code the relevant data extracts related to students' experiences.

Since a single data extract could be assigned to multiple codes, the coder carefully reviewed each data extract to ensure that all relevant meanings were captured. This process generated a preliminary list of 34 codes. Because this study involved only one coder, the coder conducted two separate coding rounds two weeks apart to ensure intra-coder reliability (Schreier, 2012).

The coder subsequently reviewed the preliminary codes to identify conceptual similarities. Following an iterative approach, similar codes were merged, reducing the final number of codes to 29. These 29 codes were organised into four main themes and 13 subthemes, which capture the distinct dimensions of students' experiences associated with the use of GenAI tools.

4. Study Findings

50% of the studies employed a mixed-methods research design, whereas the remaining studies adopted qualitative approaches such as case study, phenomenological study, and exploratory study. These studies used various data collection methods, such as interviews, surveys, experiments, and text analysis of reflections, Padlet discussions, and written work. The studies primarily involved undergraduate and postgraduate students from universities in the US, the UK, Switzerland, and Australia.

The studies exposed participants to a range of GenAI-supported assessment activities, such as essay writing, formative e-assessments, creative writing, research tasks, exam preparation, and language learning. About 60% of the studies focused specifically on ChatGPT, whereas the remaining studies were not limited to a specific GenAI tool.

The analysis resulted in 29 codes organised into four main themes and 13 subthemes. The four themes capture the uses, perceived benefits, challenges and limitations, and academic integrity and ethical implications associated with GenAI use in assessments. Figure 2 presents a thematic map that summarises the study's findings.

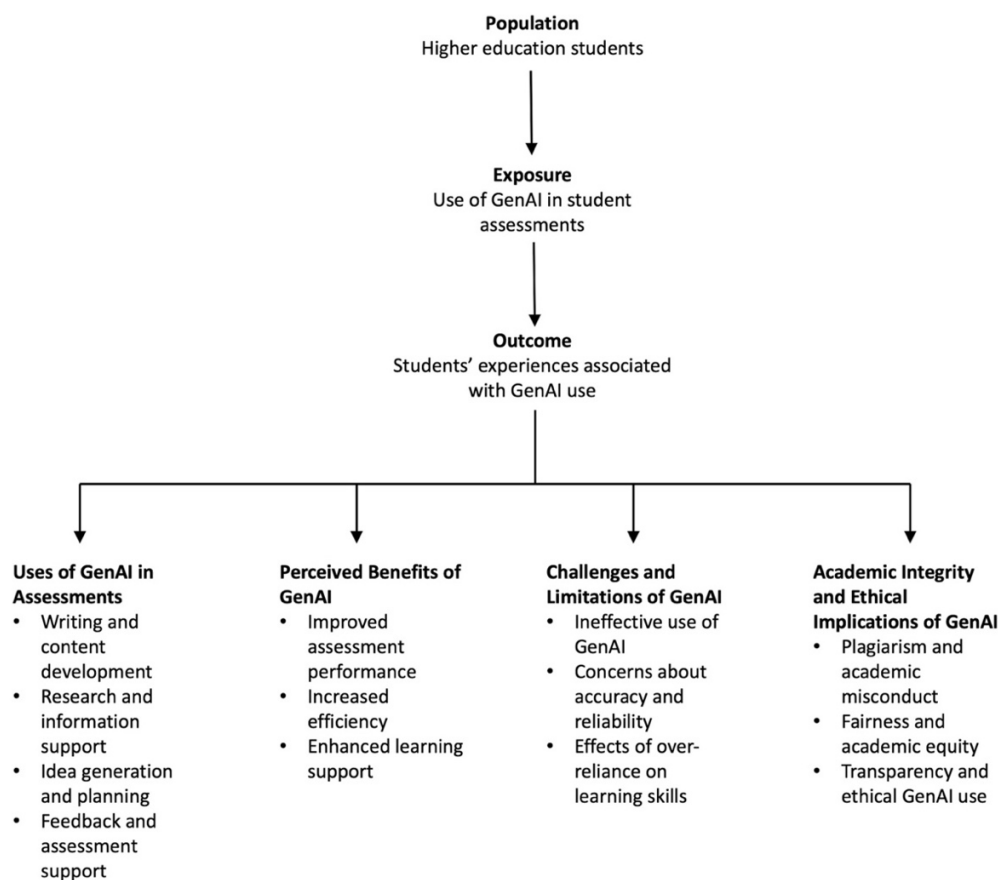


Figure 2: Thematic map

4.1 Uses of GenAI in Assessments

This main theme concerns how participants used GenAI tools to assist with assessment completion. The analysis identified four subthemes: (1) writing and content development, including content generation and drafting (e.g., drafting written work) and writing improvement (e.g., grammar checking and paraphrasing) (Johnston et al., 2025; Reinke et al., 2025; Wang, 2025; Williams, 2025); (2) research and information support, including information search (e.g., gathering background information) and research support (e.g., summarising texts and verifying information) (Behrens et al., 2025; Huang et al., 2024; Johnston et al., 2025; Vinyard and Roosa, 2025); (3) idea generation and planning, including brainstorming and idea development (e.g., generating ideas) and assignment planning and structuring (e.g., creating outlines and assignment structures) (Cotelli Kureth et al., 2025; Johnston et al., 2025; Wang, 2025; Williams, 2025); and (4) feedback and assessment support, including receiving feedback (e.g., obtaining timely responses and suggestions) and revising work (e.g., using feedback to refine work) (Behrens et al., 2025; Johnston et al., 2025; Song and Tang, 2025; Tossell et al., 2024).

4.2 Perceived Benefits of GenAI

This main theme concerns the perceived benefits of GenAI tools from the participants' perspective. The analysis identified three subthemes: (1) improved assessment performance, including higher-quality written work (e.g., improved essay quality and structure) and better assessment outcomes (e.g., higher grades and writing scores) (Baines et al., 2026; Cotelli Kureth et al., 2025; Song and Tang, 2025; Vincent and Lear, 2025); (2) increased efficiency, including time savings (e.g., completing tasks more quickly and receiving quick responses) and reduced cognitive effort (e.g., reducing cognitive load) (Baines et al., 2026; Huang et al., 2024; Wang, 2025; Williams, 2025); and (3) enhanced learning support, including improved conceptual understanding (e.g., obtaining definitions and explanations), increased confidence (e.g., greater confidence in completing assessments), and self-directed learning (e.g., reduced dependence on instructional staff) (Cotelli Kureth et al., 2025; Johnston et al., 2025; Reinke et al., 2025; Vincent and Lear, 2025).

4.3 Challenges and limitations of GenAI

This main theme concerns the issues, concerns, and limitations participants encountered or perceived when using GenAI tools. The analysis identified three subthemes: (1) ineffective use of GenAI, including misuse of GenAI (e.g., using unverified GenAI-generated outputs) and variable GenAI literacy (e.g., ineffective prompt creation and varying levels of GenAI proficiency) (Finkel-Gates, 2025; Johnston et al., 2025; Tossell et al., 2024; Williams, 2025); (2) concerns about accuracy and reliability, including quality and credibility of GenAI-generated outputs (e.g., inaccurate and misleading information) and citation and source verification (e.g., fake citations and lack of citations) (Behrens et al., 2025; Johnston et al., 2025; Tossell et al., 2024; Vinyard and Roosa, 2025); and (3) effects of over-reliance on learning skills, including reduced critical thinking skills (e.g., taking shortcuts and undermining critical thinking), diminished creativity and originality (e.g., producing less creative and original work), and over-reliance on GenAI (e.g., excessive dependence on GenAI) (Reinke et al., 2025; Song and Tang, 2025; Wang, 2025; Williams, 2025).

4.4 Academic Integrity and Ethical Implications of GenAI

This main theme concerns academic integrity and ethical issues associated with the use of GenAI tools. The analysis identified three subthemes: (1) plagiarism and academic misconduct, including plagiarism (e.g., writing substantial portions of assignments) and academic dishonesty (e.g., cheating and unfair academic practices) (Cotelli Kureth et al., 2025; Finkel-Gates, 2025; Vincent and Lear, 2025; Vinyard and Roosa, 2025); (2) fairness and academic equity, including unfair academic advantages (e.g., providing some students with an advantage over others) and inequitable access and use (e.g., disparities in access to or effective use of GenAI) (Behrens et al., 2025; Finkel-Gates, 2025; Vinyard and Roosa, 2025; Williams, 2025); and (3) transparency and ethical GenAI use, including the need for clear guidelines (e.g., guidance on appropriate GenAI use), transparency in GenAI use (e.g., disclosure regarding GenAI use), and ethical GenAI engagement (e.g., using GenAI responsibly) (Cotelli Kureth et al., 2025; Song and Tang, 2025; Vinyard and Roosa, 2025; Wang, 2025).

5. Discussion and Conclusions

The study's findings suggest that participants used GenAI for various assessment-related purposes, including writing and content development, research and information support, idea generation and planning, and feedback and assessment support. Participants used GenAI for activities such as generating ideas, organising

content, obtaining explanations, and receiving feedback (Cotelli Kureth et al., 2025; Huang et al., 2024; Johnston et al., 2025). These findings support the notion that students primarily use GenAI as a learning support tool rather than as a substitute for their own academic work (Hao et al., 2025; Tseng and Lin, 2024). This underscores the role of GenAI in assisting students in completing assessments (Furze et al., 2024; Zitar, 2023).

The study's findings also identified several benefits that participants associated with their use of GenAI. Participants reported improved assessment performance, increased efficiency, and enhanced learning support. GenAI was perceived to benefit participants in areas such as improving the quality of written work, enhancing conceptual understanding, reducing cognitive effort, and increasing confidence (Baines et al., 2026; Vincent and Lear, 2025; Wang, 2025). These findings are consistent with the notion that GenAI can provide personalised academic support with immediate responses and guidance tailored to students' needs (Keyhan, 2025; Zheldibayeva, 2025). This suggests that GenAI has the potential to contribute positively to student learning, particularly when used to support conceptual understanding and independent learning (Slobodsky and Durcheva, 2025; Wang, 2026).

Despite these benefits, the study also revealed several challenges and limitations that concerned participants, including ineffective GenAI use, inaccurate and unreliable GenAI-generated outputs, and reduced learning skills due to over-reliance on GenAI. Participants highlighted issues such as inaccurate information, fake citations, difficulty verifying GenAI-generated content, and undermining critical thinking and creativity (Behrens et al., 2025; Cotelli Kureth et al., 2025; Reinke et al., 2025). These findings are consistent with the challenges and limitations of GenAI reported in previous studies (Alzubi et al., 2025; Sarwanti et al., 2024). This suggests that although GenAI can enhance learning, its effectiveness depends on students' adequate proficiency in GenAI competencies (Asio, 2024; Naamati-Schneider and Alt, 2024).

The study's findings revealed that participants were concerned about academic integrity and ethical issues related to plagiarism and academic misconduct, fairness and academic equity, and transparency and ethical GenAI use. Participants highlighted concerns such as plagiarism, unfair academic advantages, and the need for clear institutional guidelines (Behrens et al., 2025; Cotelli Kureth et al., 2025; Johnston et al., 2025). These findings are consistent with previous studies that suggest concerns about fairness, accountability, and academic conduct in relation to the use of GenAI (Alrayes et al., 2024; Tsai et al., 2024). This reinforces the importance of developing institutional guidelines and assessment policies that support responsible GenAI use (Gonsalves, 2025; Mpolomoka, 2025).

In conclusion, the study's findings demonstrate that GenAI presents both opportunities and challenges in assessment contexts. While students perceive GenAI as a valuable tool for supporting learning and assisting in assessments, they also express concerns about reliability, over-reliance, and academic integrity. Therefore, the successful integration of GenAI into higher education is likely to depend on balancing its educational benefits with appropriate institutional guidelines and supporting students in developing the GenAI competencies required to use it effectively and responsibly (Asio, 2024; Gonsalves, 2025).

5.1 Research Limitations

This study has two main limitations. First, the thematic analysis included only 14 studies, which may limit the breadth and generalisability of the findings. Second, these studies were primarily conducted at universities in the US, the UK, Switzerland, and Australia. Consequently, the findings may not fully reflect students' experiences with GenAI use in different educational, cultural, or institutional contexts.

Ethics and AI Declaration

This study did not require ethics approval as it involved only a review of published articles, and the use of AI was mainly for preliminary searches and grammatical checks.

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