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Generative AI in higher education: Perspectives of students, educators and administrators

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Keywords

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stakeholders.

Abstract

With Generative AI's (GenAI) rapid development and the ability to generate sophisticated human-like text, it has evolved as a powerful technology in various domains. However, its application in the education domain was initially met with resistance due to concerns about disrupting traditional learning and assessment methods, raising questions about academic integrity, and provoking ethical dilemmas related to data privacy and bias. Many schools, higher educational institutions, and governments initially chose to ban the use of GenAI tools due to the disruptions they caused to learning and teaching practices, only to rescind their bans later. This study conducts a literature review to investigate GenAI tools from the perspectives of key stakeholders in the educational domain—students, educators, and administrators—highlighting their benefits while identifying challenges and limitations. The review found several benefits of using GenAI, such as personalised learning, immediate support, language support, and reduced administrative workload. This paper also provides usage guidelines for stakeholders and outlines future research areas to support GenAI adoption in higher education. Our findings indicate that most studies involving students had a positive view of using GenAI. There is a noticeable gap in research focusing on administrators, highlighting the need for further investigation.

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Introduction

Generative Artificial Intelligence (GenAI) has pervaded various aspects of daily life, seamlessly integrating into commonplace applications like search engines, word processors, and spreadsheets. It is accessible across many platforms, from mobile phones to computers. The capabilities of GenAI extend beyond the traditional outputs like text, images, audio, and video to include 3D models (Chiu, 2023) and computer code, showcasing its versatility in content generation. Due to its ability to produce realistic output in real-time, GenAI has become a powerful tool in diverse industries, including education, marketing, tourism, publishing, hospitality, and computer science (Dwivedi et al., 2023). The rise of GenAI tools marks a transformative phase in education. However, the discussion about using these tools in education is still in its preliminary stages and ongoing.

Perera and Lankathilaka (2023) outline the benefits of integrating ChatGPT into higher education. Research has illustrated that GenAI tools can enhance assessment feedback and streamline administrative tasks (Kelly et al., 2023). Although discourse surrounding the adoption of GenAI has been predominantly positive, several significant concerns have been raised within the education sector. These concerns pertain to academic integrity and the occasional factual inaccuracy of GenAI-generated output, rendering it unreliable (Sullivan et al., 2023). The shift from traditional in-person teaching and assessments to online learning and teaching accelerated during and following the pandemic, could be influenced by the emergence of GenAI (Sánchez-Ruiz et al., 2023). As highlighted by Perkins (2023), this impact is pronounced in the shift from supervised exams to online testing environments, where many courses conduct most assessments and tests online. The introduction of GenAI, capable of providing real-time responses to questions, even for shorter queries, poses challenges for educators in accurately distinguishing between student-generated content and GenAI-generated output. This complexity exacerbates the already challenging task of maintaining academic integrity in online assessments and testing.

While some argue against using GenAI for learning and teaching practices in educational institutions due to concerns about its adverse effects, historical trends in integrating emerging technologies in higher education suggest that banning a technology might negatively impact students and raise ethical dilemmas. Therefore, people must consider the benefits and threats of such new technologies. Furthermore, UNESCO acknowledges that GenAI can be a powerful tool if used judiciously and provides guidance addressing the complexities surrounding GenAI in education (Miao & Holmes, 2023).

Moreover, GenAI in education presents a particularly intriguing dynamic compared to other fields due to the potential for stakeholders to hold conflicting opinions. In higher education, the principal stakeholders include students, educators, and administrators, who could bring their perspectives and requirements. Understanding the diverse needs and concerns of the stakeholders is essential to working well with them (Cadle et al., 2010). Ensuring

effective collaboration and communication among these stakeholders is pivotal for unlocking the benefits of GenAI in education (Rudolph et al., 2024; Ruiz-Rojas et al., 2023) while navigating ethical, privacy and societal concerns. Hence, this study focuses on the higher education setting, aiming to understand the perspectives of various stakeholders, including students, educators, and administrators. Furthermore, Bhullar et al. (2024) have advocated for research to establish guidelines for integrating GenAI tools in academic settings.

The research aims to investigate the role of GenAI in the transition from traditional to AI-powered education, exploring the specific ways GenAI technologies were adopted and how they influenced the educational landscape. It also seeks to identify and explore the benefits and challenges of utilising GenAI in higher educational settings, assessing both the potential for enhanced learning experiences and associated risks. Additionally, the study endeavours to contribute to the responsible implementation of GenAI in higher education by proposing usage guidelines. Hence, the focus of this research paper is to address two critical questions:

- 1) What are the benefits, opportunities, and challenges of adopting GenAI in higher education from the perspective of students, educators, and administrators?
- 2) What are the proposed guidelines for implementing GenAI in higher education?

As of writing, there exists a lack of holistic studies that involve understanding and analysing the individual perspectives of the most critical stakeholders in higher education, namely students, educators and administrators. These stakeholders may have differing perspectives, opinions, and attitudes, which can cause conflicts that might impact the creation and implementation of policies for GenAI adoption. Closing this gap is imperative; otherwise, crafting well-rounded and informed policies regarding GenAI will prove challenging. While Neupane et al. (2024) focus on stakeholder perspectives collectively, an individual analysis of the perspectives of students, educators and administrators is inconspicuous. Hence, this study extensively explores the application of GenAI in higher education to understand the perspectives of students, educators, and administrators regarding the integration of GenAI in higher education. Additionally, we examine the benefits and challenges of this technology and its potential misuse, offering guidelines for its incorporation into educational practices.

This study utilises a hybrid systematic-narrative approach, with the primary objectives of investigating the present state of research on utilising GenAI in higher education from the perspectives of its stakeholders and formulating comprehensive guidelines for its effective implementation. The examination begins with analysing 331 peer-reviewed publications sourced from six prominent databases. This hybrid approach integrates the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, systematically narrowing the relevant literature to 34 studies. Subsequently, the study employs a narrative

approach to interpret and succinctly synthesise the findings, providing a comprehensive overview of GenAI in higher education.

Research method

A literature review serves as a comprehensive exploration and synthesis of existing knowledge within a particular field, offering researchers a bird's eye view of the relevant studies (Snyder, 2019). Two standard types of reviews exist – systematic and non-systematic or narrative review, with distinct pros and cons (Ferrari, 2015). However, this study has adopted a hybrid systematic-narrative approach that offers the best of both techniques rather than choosing one over the other. The hybrid approach incorporates systematic review techniques to define a precise search strategy with specified inclusion and exclusion criteria for shortlisting literature and subsequently employs a narrative approach to interpret, analyse and summarise the selected literature (Turnbull et al., 2023).

Accordingly, for the systematic elements of this review, the PRISMA approach was adopted to ensure comprehensive and transparent reporting of the literature (Page et al., 2021a, 2021b). Our review protocol's systematic elements also adhere to the guidelines for systematic reviews in artificial intelligence and education, as recommended by Stracke et al. (2023). Prior to the search, the inclusion and exclusion criteria were devised. In literature reviews, inclusion and exclusion criteria are crucial for defining the scope of the study. It is essential to articulate these criteria clearly and comprehensively (Tlili et al., 2023a). Inclusion and exclusion criteria ensure that literature reviews are focused, relevant, and methodologically sound (Meline, 2006). Table 1 illustrates the inclusion and exclusion criteria guiding this study's literature selection. The criterion headings (topic, population, date, data collection source, language and publication type) were sourced from Chugh et al. (2023).

Table 1: Inclusion and exclusion criteria.

Criterion	Inclusion	Exclusion
Topic	Usage of GenAI tools in Higher Education in any discipline.	Other educational levels, such as Schools.
Population	Students, educators and administrators	Parents and other general public
Date	≥ 2018 to 2023	< 2018
Data collection source	Primary sources such as surveys, interviews and experiments	Secondary sources such as literature reviews
Language	English language	Other languages
Publication Type	Peer-reviewed journal articles, full text only	Book chapters, conference papers, preprints, dissertations, grey literature, and editorials

A comprehensive search of six databases (Directory of Open Access Journals, EBSCOhost, Gale, Ovid, ProQuest, and PubMed) was conducted to search for literature published between January 2018 and December 2023. The selection of the six databases ensured comprehensive coverage of high-quality, relevant research across higher education. While we searched for articles from 2018 to the end of 2023 to capture all relevant research, the shortlisted papers emerged exclusively from 2023, indicating that significant research

on GenAI gained momentum only in that year. A thorough search strategy also involves precisely matching search phrases (search terms, keywords, and Boolean operators) with the research objectives (Ismail et al., 2023). Hence, keywords used in the title and abstract fields included - 'ChatGPT', 'Generative AI', 'Generative Artificial Intelligence', 'Higher Education' and 'Tertiary Education'. The utilisation of Boolean operators, such as AND, OR, and NOT, enhanced the effectiveness of the database search by allowing the researchers to combine, exclude, or broaden search terms, thereby refining and optimising the retrieval of relevant literature. Two researchers collaborated in conducting the database search to select pertinent literature for the study, ensuring the validity of the search results and minimising potential biases in the literature selection process. Afterwards, a third researcher verified that the results met the established inclusion and exclusion criteria.

In the identification stage, the initial search yielded 331 records. Before the screening stage, duplicates, non-journal and non-English articles were identified and removed, resulting in 282 records. Next, the articles' titles, keywords, abstracts, and full text were screened for conformance to the data collection source, fitness to the topic and population, leaving us with a final shortlist of 34 articles. The PRISMA flow diagram in Figure 1 shows the results of the identification, screening and inclusion process.

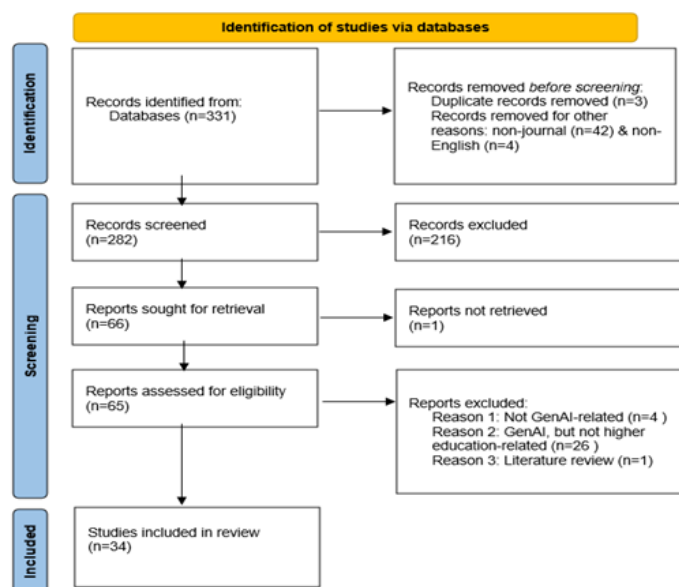


Figure 1: PRISMA flow diagram.

The data collection methods in the selected studies predominantly featured surveys, which were used in 15 instances. Nine studies conducted experiments utilising an AI tool and subsequently reported their outcomes. The emphasis on experiments not only signifies a methodological choice but also highlights the significance of hands-on exploration and self-study approaches in the research process (Hauge, 2021). Interviews were favoured by six studies as the primary data collection method, emphasising a qualitative aspect. A singular study adopted focus groups, reflecting a collaborative approach to data gathering. Additionally, three studies employed a blended strategy, combining experiments and surveys for a comprehensive understanding.

Aligned with the inclusion criteria, the selection of articles centred on the 'usage of GenAI tools in higher education in any discipline.' However, it was essential to discern the specific academic disciplines or domains from which the shortlisted studies originated to provide a more nuanced understanding and guide future research. Consequently, various disciplines were identified. Out of the 34 studies, a 'General' label was assigned to the majority (n=20), whose respondents hailed from various disciplines, suggesting GenAI tools as a pedagogical resource with broad relevance. The categorisation of studies into specific disciplines, such as 'Language Education' (n=3) and 'Programming' (n=2), hints at the specialised roles that GenAI tools play within distinct academic domains. The emphasis on these areas suggests tailored applications of AI in addressing discipline-specific challenges and enhancing educational practices. The remaining nine studies span distinct disciplines, each representing Chemistry, Computer Science, Early Childhood, Engineering, Medical, Physiology, Safety Management, Science, and Sports Management. This diversity indicates a growing trend toward discipline-specific investigations, acknowledging each domain's unique educational needs and challenges. Respondents were assumed to belong to different disciplines when the discipline was unspecified. Importantly, it is deemed unlikely that this assumption will significantly impact our findings, as the overarching focus on using GenAI tools in higher education remains consistent across diverse disciplinary contexts.

The distribution of target populations across different stakeholders in the selected studies provides further valuable insights. The emphasis on 'students' in 16 studies, as shown in Figure 2, suggests a strong interest in understanding the impact on the learner's experience. This observation aligns with Ismail et al. (2024), who noted that the majority of the articles featured students as the primary participants. The focus on 'educators' in nine studies highlights the significance of exploring how GenAI tools can support teaching and learning practices. The inclusion of 3 studies, each targeting both 'students and educators' and 'students, educators, and administrators', underscores a holistic approach to data collection. The specific attention to 'educators and administrators' in two studies and 'administrators' in one study suggests a growing awareness of administrative considerations in implementing AI tools. Analysis of the shortlisted literature follows next.

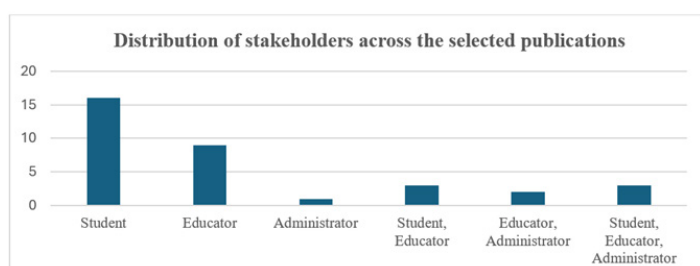


Figure 2: Distribution of stakeholders across the selected publications.

Benefits and opportunities of using GenAI

Several benefits and opportunities arise from using GenAI, and this section presents them from the perspective of its stakeholders, namely students, educators, and administrators (see Table 2). For studies that included more than one stakeholder, the information specific to the type of stakeholders has been identified and presented in the relevant subsections.

Student perspectives

GenAI tools can significantly impact personalised learning experiences for students (Chan & Hu, 2023). Whether refining grammar, structuring an essay or improving clarity, students can receive personalised guidance tailored to their needs (Xiao & Zhi, 2023). This personalised approach offers a deeper engagement with the subject matter. These versatile tools offer immediate assistance across various aspects and domains, enhancing the students' learning ability. Firstly, GenAI tools provide invaluable writing support by offering real-time feedback during the writing process (Tlili et al., 2023a). Also, these tools help students save time and effort (Bissessar, 2023). Secondly, during brainstorming sessions, GenAI tools can serve as valuable aids to generate ideas, help students explore different perspectives and refine thought processes (Chan & Hu, 2023), contributing to a more advanced and vast learning experience by supporting creativity. Thirdly, GenAI tools not only provide support for complex tasks but also improve the motivation of students to gain feedback on their work by keeping students' work and their errors secure (Bissessar, 2023) and also support computational thinking skills (Yilmaz & Yilmaz, 2023).

In the study conducted by Yilmaz and Yilmaz (2023) with 45 undergraduate students, the authors identified that students in the experimental group who had used GenAI had higher computational skills, more motivation for the lesson and programming self-efficacy than the students who did not use GenAI. This study indicates that through interactive learning experiences and feedback mechanisms, students gain confidence in their ability to navigate technological landscapes, which was also supported by Singh et al. (2023). Additionally, GenAI tools can support language enhancement and critical thinking. Providing feedback on language proficiency encourages students to critically evaluate their writing style (West et al., 2023), vocabulary usage, and coherence (Hosseini et al., 2023). Moreover, these tools enhance awareness of AI limitations, emphasising the boundary where automation ends and human judgment begins. This cultivates a culture of thoughtful communication and continuous improvement (Tlili et al., 2023a, 2023b).

Another critical aspect is that ChatGPT could be helpful as an efficient and engaging form of knowledge dissemination. In a United States study conducted with 42 students from the construction industry, ChatGPT, when used as an educational intervention, allowed students to clarify their queries about the subject matter and improved their ability to recognise hazards efficiently (Uddin et al., 2023). Moreover, through engaging educational experiences and practical simulations, students develop a deeper awareness of environmental risks,

safety protocols, and workplace challenges, contributing to their learning experiences and industry readiness.

Educator perspectives

Drawing insights from the shortlisted research papers, we explore several advantages of GenAI tools for educators. Firstly, educators benefit significantly from GenAI tools, utilising them for resource creation, lesson preparation and idea generation support (Cooper, 2023; Pinochet et al., 2023). By automating tedious tasks and offering innovative content creation ideas during brainstorming (Chan & Hu, 2023; Cooper, 2023; Keiper et al., 2023), these tools empower educators to focus on effective teaching strategies and student engagement (Ruiz-Rojas et al., 2023). However, overreliance on automation might limit teacher creativity and adaptability. Educators should view GenAI tools as aids rather than replacements for traditional resources. These tools offer supportive features that could reduce dependency on teachers and language centres, while educators ensure lessons remain tailored to student needs. In a UK survey of 284 academics by Watermeyer et al. (2023), over 83% anticipated increased use of GenAI tools, citing benefits in research writing and grant applications; one participant reported a significant increase in research productivity. GenAI tools, as highlighted by Walczak and Cellary (2023), drive innovation in teaching methods, promoting student engagement and learning efficacy. However, educators must critically evaluate these tools' effectiveness and ethical implications, aligning them with educational objectives and fostering inclusive learning environments.

Research has indicated that GenAI tools can reduce labour-intensive tasks such as proofreading, word limit reduction, and summarising reports, which could support improvements in research activity (Watermeyer et al., 2023). These tools empower educators to reclaim valuable time by providing personalised learning experiences that cater to individual student needs (Bissessar, 2023; Chaudhry et al., 2023; Pinochet et al., 2023). This dynamic approach creates an engaging learning environment. However, maintaining balance is crucial: while GenAI tools enhance interactivity, they should not diminish essential human interaction in the classroom. Meaningful discussions and activities beyond digital interfaces remain vital. GenAI tools also play a key role in providing comprehensive instructor support. They assist with grading, enhance teacher skill sets, and encourage educators to reassess assessment approaches (Chaudhry et al., 2023; Pinochet et al., 2023). Educators also opine that these tools improve creativity and critical thinking among students (Chaudhry et al., 2023). However, a potential pitfall exists, such as over-reliance on standardised testing formats generated by these tools, which may inadvertently limit the scope of creative assessment methods.

Administrator perspective

Despite challenges such as response limitations and plagiarism (Hosseini et al., 2023), GenAI tools show promise in upholding academic standards and preventing contract cheating, aligning with the objectives of effective learning

support. Administrators also benefit directly and indirectly. However, they express significant concerns regarding the challenges and ethical implications of these tools (Bissessar, 2023), highlighting the need for clear regulations and guidance to ensure their appropriate usage and mitigate potential risks (Chaudhry et al., 2023). Despite these concerns, administrators and policymakers acknowledge the value of integrating GenAI tools into educational environments to bolster learning support and have the potential to improve the inclusion of students with communication challenges (Chaudhry et al., 2023).

Table 2: Benefits of using GenAI in the education domain from the perspectives of students, educators and administrators.

Stakeholders	Benefits of GenAI in education	Authors
Students	Personalised learning support	(Chan & Hu, 2023; Uddin et al., 2023; West et al., 2023; Xiao & Zhi, 2023; Zou & Huang, 2023)
	Immediate learning support	(Chan & Hu, 2023; Chan & Lee, 2023; Xiao & Zhi, 2023; Zou & Huang, 2023)
	Brainstorming support	(Chan & Hu, 2023)
	Present concise summaries	(Totlis et al., 2023)
	Support with exam preparation and can create multiple choice quizzes	(Totlis et al., 2023)
	Cost-effective	(Chan & Hu, 2023; Romero-Rodriguez et al., 2023; Uddin et al., 2023; von Garrel & Mayer, 2023; Zou & Huang, 2023)
	Writing support for second language users	(Totlis et al., 2023; Zou & Huang, 2023)
	Assistance in code generation	(Kelly et al., 2023; Singh et al., 2023)
	Increase motivation in learning	(Singh et al., 2023; Yilmaz & Yilmaz, 2023)
	Support in designing scientific experiments	(Kelly et al., 2023)
	Access information from various types of sources	(Xiao & Zhi, 2023)
	Assess and provide feedback on students' work	(West et al., 2023)
	Increase computational thinking skills	(Yilmaz & Yilmaz, 2023)
	Mostly accurate response	(Totlis et al., 2023; Yilmaz & Yilmaz, 2023)
	Ease of use	(Foroughi et al., 2023; Zou & Huang, 2023)
	Administrative support	(Chan & Hu, 2023)
	Clarifying questions	(von Garrel & Mayer, 2023)
	Visual and audio multi-media support	(Chan & Hu, 2023)
Educators	Resource and learning material creation support, such as quizzes, presentations and worksheets	(Cooper, 2023; van den Berg & du Plessis, 2023)
	Brainstorming for designing module units	(Cooper, 2023; Keiper et al., 2023)
	Reviewing complex concepts to enhance understanding	(Dhanvijay et al., 2023)
	Provide personalised and flexible learning for students and educators	(Kiryakova & Angelova, 2023; Kohnke et al., 2023; Pinochet et al., 2023)
	Reduce time-consuming teaching activities	(Kiryakova & Angelova, 2023)
	Educators can use this to improve student engagement by creating tailor-made content for diverse students	(Ruiz-Rojas et al., 2023)
	Flexibility in material selection, providing feedback and improvement suggestions	(van den Berg & du Plessis, 2023)
Administrators	Improve research productivity	(Watermeyer et al., 2023)
	Ability to process multiple languages due to its multi-lingual model and can detect AI plagiarism. Effective learning support and enhanced learning experience, versatility in handling assignments, facilitation of real-time feedback. Aiding students with learning disabilities	(Chaudhry et al., 2023)
Students and Educators	Valuable tool for idea generation and organisation in the initial phase of writing, enhanced efficiency	(Barrett & Pack, 2023)
	Ability to serve as a search engine, can be useful in academic content creation and syllabus design, and support daily educational activities.	(Hasanein & Sobaih, 2023)

	Support in content creation, research assistance, coding support, fact-checking and information retrieval, idea generation for course topics, test preparation for interactive and engaging study process	(Keiper et al., 2023)
	Assistance in problem-solving, interactive learning experience, adaptability and accessibility, skill development, language learning support, rapid assessment evaluation support, usefulness for learners with disabilities	(Rahman & Watanobe, 2023)
	Interaction and learning assistance, providing useful learning content and immediate feedback, positive impact on writing and communication skills,	(Tlili et al., 2023)
Educators and Administrators	Integrate innovation in teaching, assistance in research, enhanced conversation and exploration, speed and efficiency, assistance in professional development	(van Wyk et al., 2023)
Students, Educators and Administrators	Saves time, supports both learning and teaching activities, efficient in accessing information, and improves learner engagement	(Bissessar, 2023)
	Helping to overcome language barriers, enhancing writing proficiency, improving efficiency, brainstorming, serving as a studying tool, assistance in structuring and summarising texts	(Hosseini et al., 2023)

Challenges of using Generative AI

Despite its increasing popularity, GenAI is not devoid of challenges. This section explores the various challenges of GenAI highlighted in the selected literature from the perspectives of students, educators, and administrators. Table 3 provides a summary of the challenges of using GenAI.

Student perspectives

The research by Chan and Hu (2023), based on a survey of 399 undergraduate students, identified eight challenges in the use of GenAI tools for students: accuracy, transparency, privacy, ethical issues, holistic competencies, career prospects, human values, and uncertain policies. Similarly, the qualitative approach to academic perception using Chatbots like ChatGPT conducted by van Wyk et al. (2023) comprehensively discussed the challenges, including bias, user privacy, the uses of user data and the cost of a subscription. Privacy and security of student data raises concerns about data protection, unauthorised access, and potential misuse of personal information (Chan & Hu, 2023; Chan & Lee, 2023).

In a medical education study, research students found that ChatGPT's responses on anatomical variants and clinical significance were inadequate without systematic classification. However, ChatGPT provided accurate descriptions of anatomy, concise chapter summaries, and useful advice on anatomical terminology (Totlis et al., 2023). A cross-curriculum study by West et al. (2023) identified that ChatGPT could not generate high-quality reports as it contained incorrect experimental details, inconsistent information between sections and fabricated references. ChatGPT's numerical mathematical solutions were evaluated by Sánchez-Ruiz et al. (2023), who highlighted its low accuracy in calculating numerical questions. Moreover, students are concerned about over-relying on ChatGPT for problem-solving and knowledge acquisition, hindering their ability to develop critical thinking skills and independence (Sánchez-Ruiz et al., 2023). A lack of proper use can adversely impact critical thinking and the ability to investigate and draw conclusions on assignments or future work (Singh et al., 2023).

Educator perspectives

A survey conducted with Bulgarian university professors indicates that when students do not verify the content generated by ChatGPT, they can learn false, malicious, or biased information (Kiryakova & Angelova, 2023). According to Cooper (2023), exploring ChatGPT's responses to science education questions reveals impressive capabilities and significant concerns. STEM (Science, Technology, Engineering and Maths) has very different integrity challenges from heavily text-based disciplines. This is not a one-size-fits-all issue. While ChatGPT demonstrates remarkable human-like responses, its output lacks evidence and sufficient qualifications, potentially positioning itself as an epistemic authority. This criticism is particularly concerning for science educators prioritising evidence-based teaching explanations. Also, the study by Watermeyer et al. (2023) highlighted three important concerns of educators. Firstly, educators are concerned that less proficient writers may use these tools to expedite writing, potentially leading to a flood of research articles and undermining research credibility. Secondly, using AI-generated text with added references raises ethical concerns and questions about academic integrity. Finally, it prompts a discussion on whether academics feel pressured to produce more outputs in less time due to GenAI tool use.

Educators at an African distance e-learning university expressed concerns about students potentially cheating on assessments with ChatGPT, noting that existing technological tools are insufficient in detecting this ethical issue as academic dishonesty or plagiarism (van Wyk et al., 2023). Through investigation of user experiences, privacy concerns were also posed. Contrary to the ChatGPT FAQ on the official OpenAI website, ChatGPT has explicitly denied storing or using user conversation data or personal information. This misinformation could be concerning for learners and educators, particularly those less familiar with technology and privacy issues (Tlili et al., 2023a, 2023b).

Administrator perspectives

Bissessar (2023) researched all the stakeholder perspectives on GenAI tools and concluded that ethical issues regarding the use of AI tools are the main challenges. Similarly, Hasanein and Sobaih's (2023) investigation suggests a need to examine the long-term impact of GenAI on higher education to develop proper guidelines and policies that apply to the responsible use of GenAI in higher education. Furthermore, research pointed out that appropriate training is required for students and faculty members to avoid ethical concerns about the responsible use of GenAI.

Generative AI usage guidelines

Based on the identified benefits and challenges of GenAI, it is evident that stakeholders hold mixed opinions, with both enthusiasm and concern surrounding its use. Without clear guidelines, this could lead to inconsistent implementation, potential misuse, and a lack of trust in the technology. Establishing comprehensive policies and standards is crucial to harness the benefits while mitigating the risks

Table 3: Challenges of GenAI use in education from various stakeholder perspectives.

Stakeholders	Challenges of GenAI	Authors
Students	Academic misconduct	(Hargreaves, 2023; West et al., 2023; Xiao & Zhi, 2023)
	Inaccuracy	(Chan & Hu, 2023; Xiao & Zhi, 2023)
	Equity	(Chan & Hu, 2023)
	Lack of engagement in certain disciplines, such as healthcare settings and among older students	(Kelly et al., 2023)
	Hallucination	(Walczak & Cellary, 2023)
	Academic integrity, ethical debates	(Xiao & Zhi, 2023)
	Over-reliance on these tools	(Singh et al., 2023; West et al., 2023)
	Privacy	(Chan & Hu, 2023)
	Decrease in critical thinking	(Chan & Hu, 2023)
	Lack of authorship	(Walczak & Cellary, 2023)
Educators	Inappropriate use by Students – generating content and then inserting references	(Cooper, 2023)
	Ethical concerns such as content moderation issues, risk of copyright infringement	(Cooper, 2023)
	Ethical dilemmas, academic integrity	(Keiper et al., 2023)
	Inability to provide contextual or diverse range of cultural perspectives	(van den Berg & du Plessis, 2023)
	Mass produce and high churn research	(Watermeyer et al., 2023)
	Impact students' emotions when other students score higher marks while using GenAI tools	(Kiryakova et al., 2023)
	Students' trust without verifying the validity of the content	(Kiryakova et al., 2023)
	Challenges to the effectiveness of assessment practices	(Kiryakova et al., 2023)
Administrators	Equity, Unfair advantage to GenAI users, Ethical use of GenAI tools	(Chaudhry et al., 2023)
Students and Educators	Ethical issues in using GenAI	(Barrett & Pack, 2023; Chan & Lee, 2023)
Educators and Administrators	Cost implications, ethical consideration, academic dishonesty	(Van Wyk et al., 2023)
	Lack of creativity and inability to think critically, loss of human interaction, hallucination, inability to access, cost implications and overreliance	(Bissessar, 2023)
Students, Educators and Administrators	Overreliance, academic integrity, lack of quality and accuracy, learning outcomes, student skill set, ethical concerns	(Hasanein & Sobaih, 2023)
	Lack of transparency, misinformation, plagiarism, privacy, hidden biases, overrepresentation of a few languages and unavailability in some countries.	(Hosseini et al., 2023)

associated with GenAI. As GenAI tools become more common, guidelines can help to uphold ethical standards. These guidelines should address the concerns of educators, students, and administrators, encompassing policies, procedures, ethics, and best practices. As such, this requires an in-depth examination to understand the role of AI in educational settings, and there needs to be a call for the development of guidelines at a national level (Cooper, 2023) to ensure the ethical and credible use of GenAI detailing what is acceptable and what is not (Barrett & Pack, 2023).

For students

Most of the selected studies with students (Bissessar, 2023; Hosseini et al., 2023) indicated that they are the most interested in the stakeholder group to adopt GenAI. Also, with the rapid advancement and convenience of GenAI, it may soon become an essential professional skill, and there is a need to provide training to students. Some suggested ways are conducting peer evaluation of GenAI writing, allowing students to compare their work to AI-generated work, utilising GenAI to review their work, and providing feedback on how to improve it (West et al., 2023).

A large-scale study on student's views of GenAI found that 15% of students who had never used these tools still felt confident in using them (Kelly et al., 2023). It was suggested

that universities should clearly communicate the proper use of GenAI and outline the academic risks associated with improper referencing. Bissessar (2023) identifies concerns about academic integrity, creativity, and the cost of AI assistive tools that students are likely to use. This suggests the importance of students critically assessing the impact and implications of AI tools on their education. Given the increasing apprehensions surrounding the information, ethical, and educational challenges associated with ChatGPT, alongside the noticeable preference of doctoral students towards its utilisation in writing (Zou & Huang, 2023), proactive steps are essential to mitigate the adverse effects on students. Students can leverage GenAI to assist in research activities, writing tasks, drafting essays, and summarising complex concepts. However, while its use in certain contexts may be acceptable, substituting it for completing assessment tasks crucial to earning degrees poses significant risks and challenges. This not only affects the educational institution awarding the degree but also has broader implications for society, as students may graduate without genuinely understanding tasks critical for future employment. Addressing these concerns requires a reliable action plan to ensure institutions actively mitigate the impact of GenAI on the integrity of higher education awards.

Students should be educated about privacy risks and trained to avoid sharing sensitive information. They need to critically evaluate ChatGPT-generated information for accuracy, relevance, and credibility and cross-reference it with multiple sources (Kiryakova & Angelova, 2023). If a child who has not learned addition is given a calculator and asked to add numbers, they might trust the displayed result unquestioningly. In contrast, someone who has learned addition can verify and justify the calculator's answers. This outlines the importance of promoting critical thinking, particularly as certain GenAI tools can provide differing answers of varying quality despite the same prompt (Tili et al., 2023a, 2023b). Also, students should be supported with prompt writing skills to use these GenAI tools effectively and efficiently (Yilmaz & Yilmaz, 2023).

For educators

Studies by Kiryakova and Angelova (2023) and van Wyk et al.(2023) indicate that some educators have low levels of knowledge or do not use GenAI tools or use them infrequently. Some educators have shown greater resistance to utilising GenAI tools, perhaps due to a lack of recognition of their relevance in the learning process(Ruiz-Rojas et al., 2023). In addition, educators mention ChatGPT with words like "poison", "fraud", "laziness", "dope", "sly" and "pretentious" (Kiryakova & Angelova, 2023). The negative opinion could be because these technologies are in their early phase, and educators may need time to better understand and integrate them into their teaching and learning activities (Watermeyer et al., 2023). According to the techno-trends awareness theory, educators should adopt innovative classroom practices to foster a positive attitude towards technology. This necessitates training educators to use these technologies (van Wyk et al., 2023).

In Barrett & Pack's (2023) survey, educators stressed discussing the ethical considerations of using GenAI tools in writing. The study found that using GenAI for writing assignments, whether disclosed or not, was universally deemed unacceptable by both students and teachers, underscoring the need for transparency about these tools' limitations. Furthermore, as reported in the study by Luo et al. (2023), instead of panicking over students using ChatGPT for assignments, educators should view this as an opportunity to reflect on and improve assessment methods, thereby strengthening educational integrity. In line with this, educators should think of new assessment approaches, such as oral debates, as writing essays will no longer be difficult with the support of GenAI tools (Tlili et al., 2023a). Chaudhry et al. (2023) highlight that while ChatGPT has the potential to improve students' learning experiences, its integration into education systems demands thoughtful planning and consideration of its implications on academic integrity and assessment practices. Resonating with what Barrett & Pack (2023) have addressed for writing assignments, open discussions and effective guidelines are essential to ensure its responsible and beneficial use in educational settings. National-level guidelines are crucial to determine appropriate student usage of GenAI, provided it is supervised by educators, administrators and accompanied by effective ethical training on the use of GenAI.

GenAI guidelines should provide clear guidance to govern the use of Gen AI (Bissessar, 2023). The guidelines need to be based on educational practices and the importance of balancing the benefits and challenges associated with GenAI technology in academic settings. Higher education institutions are still looking for evidence-based cases and studies around the use of GenAI that could be used to help institutions reflect on the risks GenAI poses for the higher education sector.

Cooper's (2023) exploration of ChatGPT's potential in science education highlighted educators considering alternative approaches to assessment, integrating AI-assisted projects, and adopting a collaborative approach to assessment design. However, Zou and Huang (2023) do not discuss developing alternative assessment approaches but focus on mitigating the negative impacts of ChatGPT on writing. However, promoting critical thinking and originality and exploring non-traditional assessments could address concerns about ChatGPT's impact on students' writing abilities and academic integrity.

Educators are encouraged to integrate ChatGPT into the curriculum and adopt formative assessment practices (Foroughi et al., 2023). Factors such as performance expectancy, effort expectancy, hedonic motivation, learning value, personal innovativeness, and information accuracy concerning the intention to use ChatGPT need to be determined (Foroughi et al., 2023). These aspects may be important considerations in leveraging GenAI technologies effectively in educational settings. Higher education students and teachers use ChatGPT for academic purposes, and the consequences it brings to the academic environment can be detrimental (Hasanein & Sobaih, 2023), so there is a need to establish clear guidelines to provide training sessions for students and faculty.

Educators are concerned about plagiarism (Barrett & Pack, 2023; Chaudhry et al., 2023). There is a need to prevent plagiarism through AI tools and promote originality and creativity. Lesson planning can be enhanced using GenAI, empowering teachers (van den Berg and du Plessis, 2023) albeit, assessment tasks should undergo a redesign process to mitigate the risks related to academic integrity that arise from the utilisation of GenAI (Kelly et al., 2023). It is pertinent to combine AI with in-person assessments, and recognising the need for effective integration, educators are encouraged to raise awareness of GenAI's uses and limitations. (Chan & Hu, 2023). This approach becomes especially crucial as students often exhibit relatively low knowledge, experience, and confidence in utilising GenAI. Consequently, as emphasised by Kelly et al. (2023), there is a compelling need for explicit instruction on how to use GenAI tools appropriately in educational settings.

GenAI can enhance English language teaching by integrating AI chatbots with traditional methodologies for comprehensive learning (Kostka & Toncelli, 2023). It is recommended to responsibly use GenAI to explore the intricate dynamics between AI chatbots and traditional teaching methods. The potential challenges and ethical implications that may arise in the integration process are still in its infancy stage. Striving for a balanced approach, Hasanein and Sobaih (2023) recommend clear guidelines and training for responsible use, underlining the importance of educators being well-versed in ethical considerations and responsible use of AI tools. Recommendations include providing clear guidelines on the use of GenAI and training for responsible GenAI use, integrating AI chatbots for comprehensive learning, and ensuring educators understand ethical considerations associated with GenAI tools.

For administrators

The need for comprehensive policies and updates to plagiarism policies has been emphasised (Romero-Rodríguez et al., 2023). To streamline the examination of potential academic misconduct, it is essential for governance offices to regularly revise and uphold policies and procedures. This involves keeping the definitions of various forms of academic misbehaviour current and reflective of contemporary misconduct trends. According to Hosseini et al. (2023), the discussion on incorporating ChatGPT in healthcare highlighted specific techno-ethical challenges that need careful consideration in creating context-specific policies. While there is enthusiasm about technological advancements, critical aspects such as defining access levels to clinical notes, regulating data reuse, ensuring patient privacy, holding user groups accountable, and attributing credit for data contributions require deliberate design and enforcement. Also, institutions must revisit their performance-based evaluation approach to better assess students' learning outcomes and teaching effectiveness and develop innovative assessment methods that enhance creative thinking, problem-solving, and communication skills (Chaudhry et al., 2023).

At the institutional level, there may be a lack of cohesive policies, guidelines, and frameworks governing the ethical and responsible use of GenAI across different departments, programs, and disciplines. Institutions may struggle to establish clear protocols for data management, intellectual property rights, and student privacy in the context of GenAI-enabled technologies. Furthermore, there may be limited resources and infrastructure to support faculty and staff in effectively integrating GenAI into curricular and co-curricular activities (Barrett & Pack, 2023). This warrants that institutions provide educational resources and workshops to help students (Chan & Hu, 2023) and educators with clear and consistent guidance on the permissible use of GenAI in different activities associated with teaching, learning, assessment and research.

Table 4: Usage guidelines of GenAI in the education domain.

Stakeholders	GenAI usage guidelines
Students	1. Use GenAI tools to get feedback on students' work (West et al., 2023). 2. Learn to use GenAI tools responsibly and ethically (Dhanvijay et al., 2023; Hasanein & Sobaih, 2023). 3. Increase transparency, accountability and data privacy awareness (Walczak & Cellary, 2023). 4. Encourage students to independently question, analyse, and synthesise information (Hasanein & Sobaih, 2023).
Educators	1. GenAI should be included in the curriculum for learning and teaching tasks to personalise learning to suit individual students' needs (Ruiz-Rojas et al., 2023). 2. Creating new teaching philosophies (Tlili et al., 2023). 3. Automate the assessment of tasks and provide faster feedback to students (Ruiz-Rojas et al., 2023). 4. Regularly monitor and verify the feedback provided by GenAI tools (Ruiz-Rojas et al., 2023). 5. Respect students' data's rights and privacy (Ruiz-Rojas et al., 2023). 6. Instruct students to explore and creatively use GenAI tools (Foroughi et al., 2023).
Administrators	1. Revise and refine the current performance-based evaluation systems used to monitor students' learning and development and revisit academic integrity policies (Chaudhry et al., 2023). 2. Provide appropriate training, resources and timeframe for educators (Kelly et al., 2023). 3. Create context-specific policies to avoid miscommunication and ambiguity (Hosseini et al., 2023). 4. Create policies and guidelines for appropriate use (Bissessar, 2023; Kiryakova & Angelova, 2023). 5. Recognise and minimise the risks of GenAI (Luo et al., 2023).

In Australia, the focus of the Tertiary Education Quality and Standards Agency has now shifted more distinctly toward the assurance of learning, specifically to assessment methods (TEQSA, 2023a, 2023b). Ruiz-Rojas et al.'s (2023) focus on the potential of GenAI tools in university education highlighted the importance of including GenAI in the curriculum and tailoring integration based on subjects. Their findings reveal that GenAI tools are crucial in developing massive online classrooms (MOOCs) when integrated with an instructional design matrix. Administrators need to ensure appropriate timeframes, resourcing, and training for educators (Kelly et al., 2023) to support students in engaging with GenAI tools appropriately. Kiryakova and Angelova (2023) posit that while ChatGPT shows promise in supporting teaching and learning by assisting educators in organising information and creating tailored materials, there are concerns regarding its potential misuse and impact on knowledge assimilation, assessment validity, and data security. Despite the benefits, challenges persist in effectively integrating AI tools into education.

University professors generally view ChatGPT positively, recognising its potential to enhance teaching by saving time and engaging students. However, many educators lack a comprehensive understanding of these tools and their

implications, highlighting the need for enhanced digital competencies. To address these challenges, educational institutions must prioritise developing strategies and training programs to enable students and educators to use AI applications in education responsibly and effectively. Administrators also need to assess if any elements of the institution's current approach to learning, teaching and assessment need to be altered in the light of GenAI.

Academics recognise the benefits and risks of using ChatGPT for teaching and learning (van Wyk et al., 2023) and also the need for thoughtful and measured adoption to minimise risks, indicating the importance of administrators critically evaluating the implementation of AI tools (Hosseini et al., 2023). Including AI literacy in higher education curricula is imperative, as it can support creating a culture of responsible AI use. Encouraging students to reflect on the ethical implications of using GenAI applications in their studies can enhance their understanding of the importance of transparency, accountability, and data privacy (Walczak & Cellary, 2023). Some usage guidelines for using GenAI in the education domain based on the selected papers are outlined in Table 4.

Discussion

GenAI is a double-edged sword (Hosseini et al., 2023;), requiring us to balance its benefits and drawbacks by leveraging its potential while mitigating risks (Ifelebuegu et al., 2023). On the one hand, it offers various advantages, such as automatically generating outlines and summaries, supporting personalised learning, and providing writing feedback. On the other hand, our overreliance on technology, coupled with GenAI's ability to generate entire assessment texts, is exposing flaws in our industrialised assessment system, which prioritises superficial compliance over quality and originality (Popenici et al., 2023), leading to several challenges. These challenges include the authentication of individual achievements for accreditation, potential threats to academic integrity principles, privacy and inaccuracy of the produced results. This calls for sustainable responses to integrate GenAI into learning and assessment policies, as well as the need for support in understanding and using the technology for both staff and students. Calls have been made to redesign assessment instruments to ensure they do not hinder student learning due to GenAI (Ogunleye et al., 2024). The Australian Academic Integrity Network (AAIN) has developed a document that suggests the appropriate use of GenAI in higher education, aligned with the Higher Education Standards Framework (Threshold Standards) 2021, emphasising the assurance of teaching, learning, research, and research training quality, while also addressing content, skills, assessment, learning outcomes, and maintaining academic and research (Munoz et al., 2023). However, to create pedagogically richer forms of online learning, it is essential to anticipate the needs of tech-savvy students (Chugh, 2010).

Using GenAI requires proper understanding and training, similar to learning to drive a vehicle. In education, this involves teaching both students and staff to use GenAI ethically and responsibly, as well as developing methods to

evaluate its outputs. Similar to Van Wyk (2024), promoting interdisciplinary learning and critical digital literacy among students are emphasised for responsible AI use to address concerns such as plagiarism, factual errors, and protecting sensitive information when using GenAI tools. Educators should also get practical training on using it (Sevnarayan & Potter, 2024) and be able to learn at their own pace to get better at using GenAI in their teaching. They should then support students in becoming good at checking the work it creates. This way, students can develop their critical thinking skills and reduce their overreliance on these tools. Collaboration among educators and receiving personalised coaching can facilitate them to integrate GenAI into curriculum design and teaching practices effectively. By sharing their knowledge and experiences with peers using teaching and learning communities of practice, educators can support each other and develop best practices in using GenAI tools for education.

Administrators play a crucial role in developing comprehensive policies, creating resource materials to use GenAI for educators and students effectively, updating curriculum integration, and ensuring efficient implementation of AI tools. Policies addressing data privacy, algorithmic biases, and responsible AI use are essential for educational institutions. To enhance consistency and coherence in using GenAI across the institution, administrators should establish a university-wide GenAI task force. This body could serve as a platform for educators and administrators to exchange insights on the utilisation and impact of GenAI in educational settings that would support the development of policies and procedures. In addition, administrators can play a crucial role in creating easy-to-use resource materials by developing an online portal or resource hub for students and educators to access the best practices for using GenAI. They can also support organising face-to-face or virtual workshops and training sessions for all stakeholders. Furthermore, administrators need to conduct comprehensive reviews of select modules in each course. This will aid in assessing how learning objectives are adapted to using GenAI technologies in learning and assessment and determine necessary refinements in learning resources, instructional strategies, and assessment methods. Priority should be given to units with higher risk profiles due to the students' use of GenAI in this process. Considering in-class assessments could be beneficial for units with assessments mapped to lower-level cognitive processes. This approach allows students to engage with specific, rather than general, contexts, enhancing the relevance and application of their learning. Additionally, a clear and well-defined GenAI-focussed policy on academic integrity should be established, ensuring all stakeholders understand the standards and expectations. Sevnarayan and Potter (2024) highlight the importance of involving all stakeholders (students, educators, and administrators) to navigate the implementation of GenAI effectively.

Our review indicates that ChatGPT has been the most popular GenAI tool. Administrators should emphasise and recommend introducing a tailor-made GenAI tool for education to government bodies and GenAI tool makers such as OpenAI, Google Gemini, and Microsoft. With the release of ChatGPT-4o, which includes emotional intelligence

features, there is a clear opportunity for a specialised version or product tailored for educational purposes, possibly dubbed ChatGPT-4e. This concept parallels the success of Google Scholar by Google in supporting the search for scholarly articles. Education-specific GenAI tools can increase the accuracy of the outputs produced by these tools as the content is based on scholarly articles. Also, these tools could support alleviating hallucination issues, which was another major concern raised by all stakeholders. Considerations of timeframes, resourcing, and training for educators are crucial for successful GenAI integration in education. Ultimately, clear guidelines and collaborative efforts among stakeholders are essential to harness the potential of Generative AI while mitigating associated risks in educational settings.

Conclusion

This literature review has provided a comprehensive understanding of the current research on adopting GenAI in higher education as well as the benefits and challenges from students', educators', and administrators' perspectives. The guidelines for GenAI usage in the higher education domain have also been reviewed and discussed.

Through a hybrid systematic-narrative approach, the study synthesised findings from 34 diverse sources. GenAI can benefit the student learning experience, including the accessibility of up-to-date information and knowledge retrieval, enhanced confidence and motivation, writing support, creativity support, timely feedback, time efficiency, cost-effective learning assistance and applicability to various subjects and disciplines. Educators enjoy the benefits of GenAI in terms of improved teaching quality, teaching efficiency, continuous professional development, enhanced flexibility in materials preparation, and comprehensive instructor support. GenAI also benefits school administrators in information acquisition, improved administration processes, and educational paradigm innovation. In particular, GenAI can improve the accessibility and inclusivity of education.

Challenges to adopting GenAI in higher education were also identified. The biggest concern from all three stakeholders is academic integrity, including information privacy, copyright, ethical issues and plagiarism. Students and educators also face challenges in accurately evaluating the content produced by these tools. Due to a lack of transparency and authorship, the content generated by GenAI may lead to potential misinterpretation and misunderstanding. Reassessing assessment types that embrace the benefits of GenAI and achieve the expected learning outcomes is a challenge for educators. Furthermore, educators and administrators are concerned about overreliance on GenAI tools, as it is argued that overreliance on GenAI can reduce human skills such as critical thinking.

The guidelines for GenAI usage in higher education were explored. While educators may introduce GenAI in the curriculum for learning and teaching, it is critical to set clear learning objectives, enhance specificity in assessment tasks, and use diverse assessment methods (e.g., presentation and visual modelling). Students should be aware and responsible

for AI usage, critically validate AI-generated content, be aware of privacy and security and use GenAI to foster independent learning. Administrators should be responsible for policy and guidelines development, minimising risks of GenAI usage, ensuring equity in access and usage, regular monitoring and evaluation, and enhancing infrastructure and resources for GenAI integration.

As with any study, this study also has its limitations. We considered the perspectives of only three stakeholders in higher education and provided guidelines based on the shortlisted literature. However, other stakeholders, such as professional staff, also play a significant role in higher education. Their perspectives, although important, were not included in this study as our focus was specifically on teaching and learning. Moreover, in our study, the administrators we considered could also serve as educators, leading to potential overlap between stakeholders' perspectives.

Future research in the higher education domain encompasses various areas, including but not limited to the integration of GenAI in curriculum design, assessments in the GenAI era, the use of GenAI for learning enhancement and policies governing GenAI usage. GenAI has emerged as a transformative force across numerous fields, offering everyday enhancements and revolutionary advancements. As this powerful technology continues to evolve, higher education institutions must maintain an open attitude towards its potential while exercising caution. This balanced approach will help ensure we maximise its benefits and minimise the risks.

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