



Faculty Perspectives on the Opportunities, Challenges, and Ethical Implications of Generative AI in Higher Education: A Qualitative Case Study from Sindh, Pakistan

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Abstract

The rapid evolution of generative artificial intelligence has catalyzed significant innovations in both pedagogical and administrative functions within higher education, particularly regarding teaching, learning, and assessment. This study investigates university faculty perspectives on the opportunities, challenges, and ethical implications associated with the adoption of GenAI. Employing a qualitative case study design, semi-structured interviews were conducted with 12 educators from public and private universities in Sindh. Findings indicate that participants perceive GenAI as a valuable tool for facilitating personalized learning, enhancing automated feedback, streamlining lesson planning, supporting student research, and fostering student engagement. Conversely, significant concerns were identified, including risks to academic integrity, such as plagiarism; over-reliance on AI, diminished critical thinking, and challenges regarding the ethics and transparency of AI-generated content. Furthermore, participants highlighted a notable lack of institutional policy frameworks and professional training for AI integration. The study concludes that while GenAI presents substantial benefits for enhancing educational practices, there is a critical need for robust ethical guidelines, digital literacy programs, institutional support, and sustained human oversight to ensure its responsible and effective implementation in higher education.

Keywords: Generative artificial intelligence (GenAI), Higher education, Teachers' Perceptions, Ethical implications.



Introduction

Generative artificial intelligence (GenAI) has reshaped the future of higher education across the world in a short span of time. Recently, all universities have been incorporating AI-powered technologies, like ChatGPT, Gemini, Claude, and other big language models, into their learning, assessment, research and administrative processes. These tools have brought novel possibilities to increase the efficiency of education, engage students, and get personal education experiences (Kasneci et al., 2023; UNESCO, 2023). Generative AI models that give humans the power to create text, images, sound, as well as code and do more by learning from massive amounts of data with machine learning algorithms. In higher education, GenAI tools are being used in lesson planning, automated feedback, content generation, academic writing support, intelligent tutoring, and in automating administration (Chan & Hu, 2023). (UNESCO, 2023) has envisioned that the use of AI technologies can transform education by creating adaptive learning environments, personalized tutoring, and data-driven decision-making processes.

GenAI is rapidly gaining traction in the university environment because of the need for new learning strategies, flexible learning systems, and effective academic management. Another study regarding artificial intelligence in higher education indicates that GenAI can be helpful to educators in creating education resources, developing assessments, and offering personalized feedback to students (Chiu, 2024). Additionally, there are AI tools that can help students learn through intelligent tutoring systems, self-directed learning and learning resources, and curriculum adaptation that cater to their individual learning needs. The study also highlights the increased integration of AI technologies in university administration, including student support services, academic advising, scheduling, and university planning. More recent studies have found that GenAI technologies can have a positive impact on student engagement, academic achievement and research productivity. Kamalov et al., (2023) pointed out that customized learning systems based on technologies such as AI significantly raise students' motivation and learning efficiency by adjusting educational products to their learning styles and level of abilities. In a similar study, Beck et al., (2023) have the students at university stating that they find Chat GPT helpful in brainstorming ideas, organizing information, and refining their academic writing. AI can also ease the workload burden on teachers and improve their teaching efficiency (Dai et al., 2023). Though these opportunities offer a suite of new educational and ethical challenges, as the integration of generative AI in higher education continues. Plagiarism, academic dishonesty, limited critical thinking, reliance on AI tools; misinformation and bias in AI outputs have been identified as areas of challenges (Abbas et al., 2024; Memarian & Doleck, 2023). The study further notes that AI systems can provide false information or hallucinations which can impact a student's understanding and learning. Moreover, challenges surrounding explainability in AI systems, the reinforcement of social and cultural bias, and the lack of transparency and privacy in data processing have grown more and more significant challenges. One of the biggest fears has been about the effects of GenAI on human interaction and pedagogic relationship in learning environments. This over-dependence on AI technologies can also diminish the possibilities of collaborative learning and teacher-student communication (Felix, 2020). Furthermore, most higher education institutions still do not have a policy, ethical guidelines, or training programs focused on the responsible use of AI in education (Johnston et al, 2024).



University teachers play a central role in determining the successful integration of GenAI into higher education because the perceptions, experiences and attitudes held by their students will significantly impact classroom practice, assessment methods, institutional procedures, and students' use of AI technology. Despite the increasing worldwide debate on the role of AI in education, there is a lack of qualitative studies that focus on university teachers' views on the opportunities, challenges, and ethical considerations for the use of generative AI, specifically in the context of developing educational contexts.

So, with this in mind, the purpose of this study is to examine the potential and problems with using Generative AI in Higher Education from the Teachers' perspective, as well as the ethical issues arising from their use. This study aims to contribute to the body of knowledge by providing practical insights into educator's perspective on usage of AI technologies and the role of universities in introducing GenAI in the education system in a responsible and effective way.

Research Questions

1. How do university teachers perceive the opportunities with the use of generative AI in higher education?
2. What are the challenges faced by university teachers using Generative AI in Education?
3. What ethical issues do university teachers think are linked to Generative AI?

Research Objectives

1. To investigate higher education faculty's perceptions regarding generative AI's opportunities in higher education.
2. To understand challenges faced by Teachers using Generative AI in Education.
3. To discuss the ethical issues that university teachers think are linked to Generative AI.

Literature Review

Technology Acceptance of Generative AI in Higher Education

The growing use of Generative Artificial Intelligence (GenAI) in Higher Education can be traced back to (Davis, 1989) Technology Acceptance Model (TAM). TAM has two critical constructs, perceived usefulness and perceived ease of use that explain technology adoption. In the educational context, educators will be more likely to integrate AI tools into their classrooms if they believe they help boosting the efficiency of instruction, enhance assessment accuracy and quality, and improve student learning.

University teachers have shown mixed levels of satisfaction with GenAI tools like ChatGPT in relation to their lesson planning, grading, writing and personalized instruction (Kasneci et al., 2023). Teachers and students are generally positive toward the use of AI technologies due to their impact on learning efficiency and reduction of teacher workload, as indicated by (Chan & Hu, 2023). Yet the uptake of AI technologies also relies on the teachers' perceived ease of use of these systems in their teaching practices.

Unified Theory of Acceptance and Use of Technology (UTAUT) and Teachers' Adoption of Generative AI

Building on that work, (Venkatesh et al., 2003) hypothesized the Unified Theory of Acceptance and use of Technology (UTAUT), which explores the factors of performance expectancy, effort expectancy, social influence and facilitating conditions. Within higher education, these factors have a significant impact on the intentions of teachers to use and implement Artificial Intelligence technologies.

Performance Expectancy means teachers' expectations that GenAI will be a valuable tool for increasing the effectiveness and productivity of teaching. Research indicates that AI tools



help educators automate repetitive tasks, sequence their lessons, and aid in assessment practices (Dai et al., 2023). Social influence covers cultural norms and community support for AI adoption, whereas effort expectancy is defined as the expected ease of use of the AI system.

Support, including technological infrastructure, training, institutional policies are also a critical prerequisite for transforming the use of AI for positive outcomes. According to Johnston et al. (2024), the lack of institutional support and AI literacy continue to be great challenges to the effective implementation of AI technologies in universities.

Integration of AI in teaching and TPACK Framework

Technological Pedagogical Content Knowledge (TPACK) by Fui-Hoon et al., (2023) is a framework that gives an explanation to how teachers effectively integrate technology into teaching and learning processes. The framework highlights the linkage among technological, pedagogical and content knowledge.

TPACK is particularly noticeable in the context of a generative AI, as teachers should recognize the role of the tools of the new era and ensure that their pedagogical approach to their field is preserved along with the learning goals. It appears that AI tools can assist differentiated instruction, adaptive learning and student-centered approach (Yu, 2023). Those who are more technologically and pedagogically competent in handling technology are more inclined to use AI effectively in classroom use.

Moreover, GenAI can support teachers in designing teaching materials, designing tests and assessments, and in providing tailored feedback to students. Within the university, a successful integration will rely on the digital tools including competence and appropriate training for university teachers, but this fact is not always observed.

Ethical issues related to generative AI

While opportunities abound with GenAI, certain research has flagged several moral issues within Higher Education. (UNESCO, 2023) also highlighted a lack of transparency in AI systems and the potential for biasness in algorithms due to social, cultural, and gender stereotypes in training data. Likewise, the submitted report on adapted use of AI in higher education expressed various concerns over the misuse of AI-generated information (hallucinations, misinformation, bias, etc).

Another key ethical concern with the application of GenAI technologies is academic honesty is students encounter such risks like plagiarism and academic dishonesty in the context of assignments done using AI and tools for writing (Ibrahim et al., 2023). Moreover, teachers are concerned about the potential impact of over-dependence on AI technologies on students' problem-solving, creativity and independent learning abilities (Memoran & Doleck, 2023).

Privacy and data security issues are growing in importance as AI systems frequently roam through student information and generate data. This is why ethical AI integration demands accountability, transparency, fairness and institutional guidelines to ensure that it is used properly in the context of higher education institutions.

Opportunities and Challenges of Generative AI in Higher Education

For higher education, there are multiple opportunities for the use of generative AI to enhance practices. AI technologies can help deliver personalized learning, automatic feedback, research, and administrative efficiencies (OECD, 2023). AI has found its way into various support service, academic advising, and adaptive learning applications in universities.



However, there are still issues of inequitable technology adoption, inadequate AI knowledge, inadequate policies, and too much reliance on content generated by AI. Excessive use of AI could have detrimental impacts on students' analytical abilities and intellectual development (Kenthapadi 2023). Thus, universities need to strike a balance between technological innovation, educational and ethical implications when implementing AI in learning.

Theoretical Framework

The Study's Sources and Methodology provide a foundational grounding in the theoretical frameworks that underpin the application of technology, pedagogical knowledge, content knowledge, and elements of artificial intelligence (AI) ethics. These frameworks offer a holistic view through which to examine University teachers' perspectives on Generative AI in Higher Education, including its implications for ethics, challenges, and opportunities.

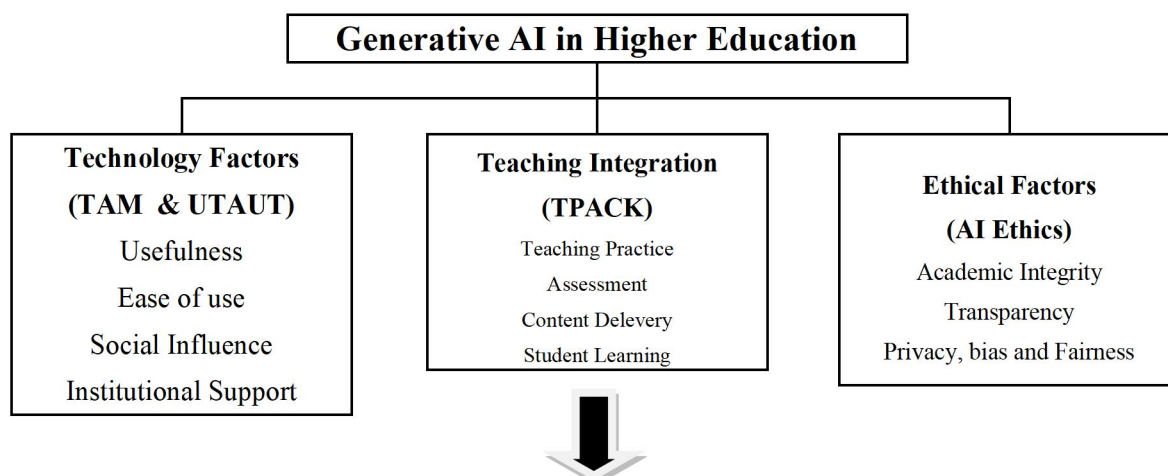
The Technology Acceptance Model (TAM) describes why people accept new technology depending upon their perceptions of usefulness and ease of use (Manduchi 2024). In the context of Generative AI, TAM offers insights into the utility of the tools for helping universities to overcome challenges in enhancing teaching effectiveness and assessment quality, boosting productivity, and integrating AI into the university environment.

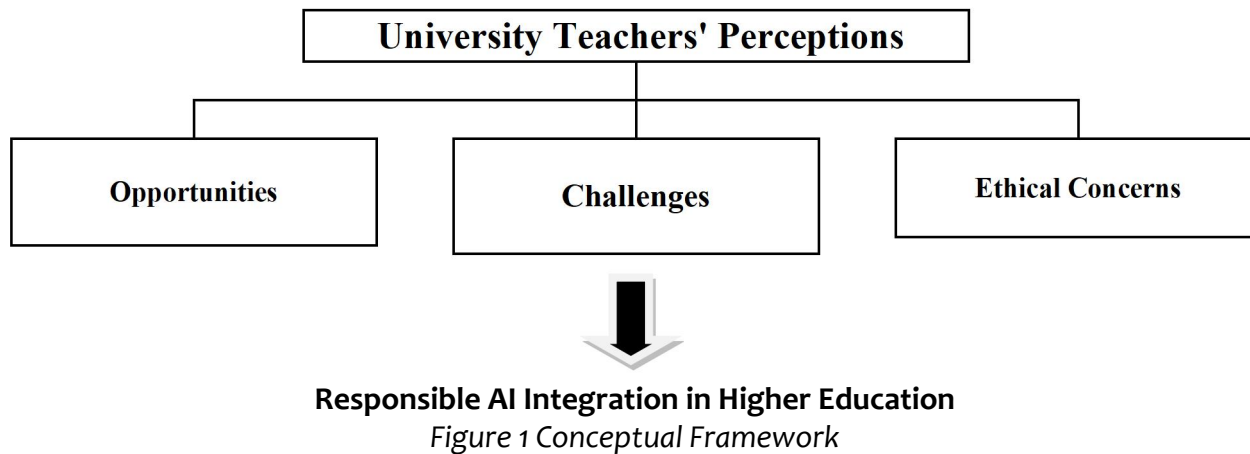
Additional factors, including performance expectancy, effort expectancy, social influence, and facilitating conditions, were also added to TAM for the Unified Theory of Acceptance and use of Technology (UTAUT), according to Ramdurai and Adhithya (2023), to explore institutional and social factors affecting the use of Generative AI, such as policies and regulations implemented in universities, peer influence, training and technical support.

The other point of view, pedagogical, comes from the Technological Pedagogical Content Knowledge (TPACK) framework that examines how teachers use technology in their teaching. It is especially pertinent to examine University teachers' integration of the GATs into their teaching strategy and content to show their demonstrated pedagogy and pedagogical appropriation of the technology to improve learning and assessment design for students (Kaswan et al., 2023).

The study concludes by incorporating necessary ethical guidelines of artificial intelligence like transparency, accountability, fairness, academic integrity, and data privacy. The principles underpin the ethical implications of using Generative AI in higher education, such as mitigating the risk of plagiarism, avoiding excessive reliance on AI-generated content, addressing biases in outputs, and ensuring data security.

The study's findings contribute to understanding the perceived, adopted, integrated, and ethical use of Generative AI in university settings by higher education teachers.





Methodology

This study employed a qualitative case study design to explore university teachers' perceptions of Generative Artificial Intelligence (GenAI) in higher education. A qualitative approach was considered the most appropriate because the study sought to gain an in-depth understanding of participants' experiences, opinions, expectations, and concerns regarding the integration of GenAI into teaching, learning, and assessment practices. Unlike quantitative methods that focus on measuring variables, qualitative research facilitates the exploration of complex social phenomena through participants' lived experiences and contextual interpretations. The case study design further enabled the researchers to investigate the phenomenon within its real-world educational context, providing rich and detailed insights into how university teachers perceive the opportunities, challenges, and ethical implications associated with the use of GenAI.

The study was conducted in universities across Sindh, Pakistan, involving faculty members from both public and private higher education institutions. A total of twelve university teachers participated in the study, comprising an equal representation of male ($n = 6$) and female ($n = 6$) faculty members. The participants ranged in age from 29 to 52 years and represented diverse academic disciplines and levels of teaching experience. This balanced representation ensured that multiple perspectives were captured, contributing to a comprehensive understanding of faculty perceptions across different institutional settings. Participants were selected using purposive sampling, a widely accepted technique in qualitative research that involves intentionally selecting individuals who possess relevant knowledge and experience related to the phenomenon under investigation. In this study, the inclusion criteria required participants to have prior experience in university teaching and familiarity with digital technologies, particularly emerging Artificial Intelligence applications such as ChatGPT, Gemini, Microsoft Copilot, or other GenAI tools. This sampling strategy ensured that participants were capable of providing informed and meaningful insights into the educational applications and implications of Generative AI.

Data were collected through semi-structured interviews conducted in both face-to-face and online formats to accommodate participants' preferences and availability. Each interview lasted approximately 30 to 45 minutes and followed a flexible interview guide that



encouraged participants to discuss their experiences openly while allowing the interviewer to explore emerging issues in greater depth. The interview questions focused on several key areas, including participants' experiences with GenAI, perceived opportunities for enhancing teaching and learning, challenges encountered during its use, concerns related to academic integrity and student learning, ethical implications, institutional readiness, and recommendations for the responsible integration of GenAI in higher education. With participants' consent, all interviews were audio-recorded and later transcribed verbatim to ensure accuracy and completeness of the data.

The collected data were analyzed using thematic analysis, following a systematic process of familiarization, coding, theme development, and interpretation. Initially, the interview transcripts were read repeatedly to gain an overall understanding of the data. Meaningful segments of text were then assigned initial codes representing significant ideas and recurring concepts. Similar codes were subsequently grouped into broader categories, from which overarching themes emerged. The themes were continuously reviewed and refined to ensure they accurately reflected participants' perspectives and addressed the research objectives. This analytical approach enabled the identification of common patterns as well as diverse viewpoints concerning the opportunities, challenges, and ethical considerations surrounding the adoption of Generative AI in higher education. To enhance the trustworthiness of the findings, the researchers maintained detailed records of the coding process and ensured that interpretations were grounded in the participants' narratives.

Findings

The themes from the interviews with 12 university teachers were summarized as three main themes. Quotes from representative participants are featured for each theme.

1. Opportunities of Generative AI in Higher Education
2. Challenges of Generative AI Integration
3. Ethical Concerns Associated with Generative AI

Opportunities of Generative AI in Higher Education

The majority believed that Generative AI is genuinely useful in learning and improving the way teachers teach, but also understood that AI can enable personalized learning and aid in research and academic endeavors as AI was mentioned by teachers for lesson planning, creating content, providing feedback, and researching.

Participant T4 explained:

- "Using the Generative AI to write my lectures makes it much quicker to create content for classes: quick outlines of examples, quizzes, and discussion topics put them into the classroom, and you have more engaging and interactive courses."

Similarly, Participant T8 said:

- "Students don't like taking part in class if they don't come to understand when they are going wrong, but with AI they are able to learn at their own speed and get tailored feedback when they need it." (Ayeni et al., 2024)

The participants showed a positive and overall favorable understanding of GenAI, considering it as a valuable tool for enhancing the efficiency of instruction and facilitating student-centered learning. AI technologies that create educational content and enable personalized learning were most well-received by teachers.

Challenges of Generative AI Integration

While acknowledging the potential of Generative AI, participants raised a number of concerns about obstacles to the adoption of generative AI in higher education. The most



prominent challenges mentioned were students' reliance on AI, a decrease in critical thinking, an inadequate amount of training on the use of AI in education, and the inability to identify AI-produced assignments.

Participant T7 Stated:

- "Many students are relying on ChatGPT to regurgitate ideas, rather than critically analyzing them, impacting critical thinking." (Zhai et al., 2024)

Similarly Participant T3 added:

- "Genuism is one of the biggest problems which are arising in plagiarism detection tools which are not reliable." (Elkhatat et al., 2023)

The findings indicate that while GenAI is beneficial for the educational aspect, teachers have some questions and concerns regarding its effects on students' autonomous learning skills and academic honesty.

Ethical Concerns Associated with Generative AI

A significant topic raised in the interviews was ethical concerns. Some participants talked about academic integrity, misinformation, and bias in the output of Artificial Intelligence, privacy, and transparency in AI systems.

Participant T2 stated:

- "AI sometimes supplies incorrect, confident information and students may treat these outputs as truth without checking the sources of information." (Dempere et al., 2023)

Similarly Participant T10 explained:

- "Students are sharing personal or academic information without knowing how it is used, which raises privacy and data security concerns. This sharing occurs without awareness of how that information is being utilized." (Herawati et al., 2024)

The teachers highlighted that there is a need for ethical instructions and institutional regulations to ensure responsible use of generative AI. They knew that AI technologies in teaching and learning still need a human route to realize the benefits.

Discussion

The results from this study show that University teachers view GenAI as a reshaping technology with great potential of improving teaching, learning, assessment and higher education research. Which align with the findings of prior research on the educational implications of artificial intelligence (AI) technologies by (Kasneci et al., 2023; Yu, 2023) The participants recognized several opportunities emerging with the use of AI like personalized learning, automated feedback, instructional support, research assistance, and enhanced student engagement. The positive perceptions towards adoption are reflected in the Technology Acceptance Model (TAM) which indicates that the adoption of GenAI by teachers is higher when they see it as useful for their work-related tasks (Davis, 1989). Participants also pointed out key barriers such as students' reliance on AI-generated content, the impact of artificial intelligence on their critical thinking, plagiarism concerns, inadequate knowledge of AI in the classroom, and a lack of institutional support. The results of the study align with Memarian and Doleck (2023), Abbas et al. (2024), who claimed that over-reliance on AI technologies, could have detrimental effects on students' analytical and problem-solving skills. In addition, there were significant ethics related issues raised, such as concerns about plagiarism, misinformation, biased content in AI-generated writing, privacy issues, and transparency. These are important concerns as recommended by (UNESCO, 2023) for responsible use of AI and mirror the importance of ethical elements like accountability, fairness, transparency, academic integrity and data protection. The results indicate that



university teachers are aware of the significant potential of Generative AI tools, but at the same time, they stress the necessity for sensible policies, training, and ethical frameworks to guarantee that the technology is utilized suitably and successfully in the academic world.

Conclusion

Higher education institutions all over the world have faced new opportunities and challenges as the field of Generative Artificial Intelligence (GenAI) has rapidly emerged. This study examined the views of university teachers about the opportunities, challenges, and ethical issues related to the use of GenAI in higher education. The results showed that teachers' overall experience indicates that GenAI is a useful tool for learning and it can positively facilitate teaching, personalized learning, research and engagement with students. It was recognized that AI technologies can help educators improve their efficiency and productivity by supporting them with lesson planning, content creation, assessment design, and the provision of timely feedback. In spite of these benefits, the study also identified challenges arising from the integration of GenAI. The teachers voiced concerns such as dependency on AI-generated content, a decline in critical thinking skills, plagiarism issues, and lack of institutional support and professional training. The challenges showed that while GenAI has the potential to revolutionize educational practices, it also requires a careful plan and continuous monitoring that allows meaningful and student-centered learning. Additionally, the study showed ethical issues arose as an important problem among participants. Teachers pointed out risks of intellectual dishonesty, misinformation, bias in outputs of AI tools, lack of transparency and data privacy issues. These concerns emphasize the importance of establishing ethical guidelines and governance mechanisms to promote responsible AI use in educational settings. The results indicate that adopting GenAI requires more than just a technological acceptance, and educators must master the balance among technological, pedagogic and content knowledge and respect ethical guidelines. The study concludes that the university teachers understand the transformative power and constraints of generative AI drawing on the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Technological Pedagogical Content Knowledge (TPACK) framework and with reference to the ethical issues surrounding and lessons learnt from AI technologies. Therefore, it is crucial for higher education institutions to apply a proper approach and maximize the educational value of AI while dealing with its pedagogical, technological, and ethical issues. To ensure that universities are equipped to successfully implement generative AI and to educate educators and students in the new educational landscape seamlessly blending AI and human efforts, a combination of providing sufficient training, institutional support, and ethical guidelines is crucial.

Recommendations

1. Higher Education Institutions should create comprehensive policies and set guidelines for responsible use of generative AI in teaching, learning, assessment, and research.
2. All our teachers are required to take part in a training program on AI literacy and professional development at universities regularly to equip them in the use of AI in pedagogy.
3. Educators and institutions should highlight the importance of ethical conduct in academic work, such as plagiarism protection, data privacy, and responsible AI application.
4. It is important to encourage teachers to integrate generative AI into their instructional practices, but not to replace critical thinking and creativity, and the capacity for independent study.



5. Universities should continue to invest in technology infrastructure and provide support systems to ensure effective and equitable access to AI technologies which are being offered for students' learning.
6. The method of assessment needs to be restructured to focus on higher-order thinking skills, problem-solving, reflective processes and learning that reduce the reliance on AI-generated content.
7. Institutional arrangements need to be set up to keep track of the use of AI and mitigate the challenges arising from misinformation, bias, transparency and data security.
8. The collaboration among teachers, policymakers, technological implementers, and researchers should be promoted to build ethical and sustainable models for the application of Artificial Intelligence in higher education.
9. Future studies should be conducted for students' perceptions of generative AI and the potential long-term impacts of AI tools on teaching and learning outcomes, performance, and quality.
10. Additional qualitative and quantitative research is needed in various educational settings to provide a more comprehensive picture of the opportunities, challenges, and ethical considerations of generative AI in higher education.

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