

Application of ChatGPT in Higher Education: Opportunities and Challenges

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Abstract

This review article examines the opportunities and challenges associated with the use of ChatGPT in higher education. Drawing on existing theoretical and empirical literature, it explores how ChatGPT can support teaching and learning through applications such as assessment, feedback provision, personalised learning, and pedagogical innovation. At the same time, the review highlights significant concerns related to academic integrity, plagiarism, reliability, and the ethical use of AI-generated content. The article argues that while ChatGPT has the potential to enhance educational practices and reduce administrative workloads, its integration into higher education requires appropriate governance, ethical guidelines, and the development of AI literacy among educators and students. The review concludes that responsible and informed implementation is essential to maximise the benefits of ChatGPT while mitigating its risks.

Key words: ChatGPT; Artificial Intelligence; Higher Education; Academic Integrity; Educational Innovation

The latest advancements in deep machine learning have led to the proliferation of AI tools that are significantly transforming educational practices. Among these technologies, the development and adoption of Generative Pre-trained Transformer (GPT), particularly OpenAI's ChatGPT (OpenAI, 2024) introduced in November 2022, has garnered significant attention. The unprecedented capabilities of this large language model (LLM), including generating human-like texts, image processing and generation, and advanced data analysis, have substantial impacts across various sectors, including education and research (Grassini, 2023; Sabzalieva & Valentini, 2023). Despite its transformative potential, ChatGPT has raised ethical concerns regarding its reliability and accuracy (Sallam, 2023). Because ChatGPT is trained on a large corpus of unfiltered and raw data, the presence of biases within its training datasets could lead to unfair outcomes. These uncertainties have elicited mixed reactions in the realm of education, with some proponents perceiving it as an indispensable tool and opponents expressing apprehension about its potential to promote academic misconduct. The purpose of this review article is to synthesise existing theories and empirical findings concerning the integration of ChatGPT in education and research contexts, including its potential opportunities and challenges. By critically examining the use of emergent AI tools, this review article seeks to inform future directions and practical advancements in this field. The findings of the review article will contribute to the understanding of benefits and limitations of AI integration in

education, offering valuable insights for educators, course designers and policymakers in developing and implementing AI-based educational interventions.

Application of ChatGPT in education: Opportunities

Rapid assessment

Existing literature highlights the potential of ChatGPT to play various roles in teaching and learning processes (Elbanna & Armstrong, 2024; Sabzalieva & Valentini, 2023). One notable application is its capability to automatise and enhance grading systems. ChatGPT can assist in semi-automating the evaluation of student works by identifying potential strengths and weaknesses within a task in a broad spectrum of assignments, including research papers, essays and other academic tasks (Kasneci et al., 2023). In this sense, educators can adapt reports generated by LLM to deliver beneficial feedback to students in formative or summative assessment contexts. Furthermore, ChatGPT enables a more precise assessment of students' learning development and struggles, allowing educators to pinpoint areas where learners face difficulties, subsequently providing targeted interventions for further improvement (Grassini, 2023). By leveraging AI tools like ChatGPT, educators could potentially reduce their administrative workloads and shift their main attention to crafting innovative lesson plans, engaging in professional development, and delivering personalised mentoring to individual students. All of these instructional activities are essential for enhancing the student learning experience and performance for future skills.

It is important to note that ChatGPT, being primarily trained on extensive datasets derived from prior evaluations, is particularly well-suited for assessing standardised examinations, such as national professional education tests. These examinations typically have abundant and publicly available historical data, and their focus on standardised assessment aligns closely with the model's capabilities (Grassini, 2023). For instance, the latest version of ChatGPT has passed the US bar law examination, a standardised 200-item test that aspiring lawyers must pass to become licensed to practice law, showcasing its potential in interpreting and processing standardised information (Katz et al., 2024). However, while ChatGPT exhibits the potential to assess the national standardised tests, its application to evaluate individual university exams may be less competent. As they often undergo annual modifications and may lack sufficient historical evaluation data. Such cases necessitate a balanced evaluation approach that integrates a transparent AI system with human oversight to ensure high-quality outcomes when using AI to evaluate student work.

Enhancing pedagogical practices

Moreover, Atlas (2023) contends that the capabilities of ChatGPT extend far beyond grading and assessment, its advanced features present compelling opportunities for educators to enhance pedagogical practices by integrating interactive classroom activities and creating engaging educational materials. Similarly, according to Rudolph et al. (2023), ChatGPT empowers educators to innovate their teaching strategies by adopting a flipped classroom approach, generating lesson plans and introducing new forms of assessments. While essays as the main form of assessment are regarded as threatened by ChatGPT, therein lies an opportunity for educators to devise multi-modal assessment strategies. By embracing these changes, educators can use assessment development not only for learning but also as learning, with the support of disruptive AI tools (Earl, 2013).

Application of ChatGPT in education: challenges

Academic dishonesty

Despite the enormous potential of ChatGPT, concerns about student plagiarism in higher education have become increasingly prominent. The rampant misuse of intellectual property without appropriate citations has long undermined academic integrity, and the emergence of ChatGPT even further amplifies the problem. It has been revealed that students who utilise ChatGPT for assignments are more likely to engage in plagiarism than their counterparts who do not use it (Bašić et al., 2023). The ease with which ChatGPT can generate high-quality text within seconds may incentivise students to employ it as a shortcut, thereby perpetuating and normalising a culture of academic dishonesty. This trend challenges the fundamental goal of assessment—to accurately and fairly evaluate and reflect student learning. Consequently, the most concerning aspect of this issue lies in its detrimental effect on educator's ability to accurately evaluate student performance. When students use AI tools, it becomes increasingly challenging to determine if they truly understand and master learning content (Grassini, 2023). As this can mask the learning deficiencies and make it difficult for educators to provide targeted feedback and develop necessary interventions. Consequently, the educational process can be less effective. To address these issues and create a fair academic playing field, several plagiarism detection tools utilising state-of-the-art algorithms to tackle the challenge of identifying AI-generated content have been made public. For instance, GPTkit claimed to have 93% accuracy, while Originality.ai claims to offer highly accurate detection across outputs generated by different LLMs (Pudasaini et al., 2024). These AI-generated

content detection tools, however, have not been widely used in universities to uncover the plagiarised content sourced from AI in students' submissions.

While precautionary measures have been implemented, recent studies demonstrate that advanced AI models like ChatGPT have significant potential to generate sophisticated text outputs that can successfully evade detection by traditional plagiarism check software, such as Turnitin which has been widely used in universities. It appears that ChatGPT can create original content that mimics human-written work with remarkable accuracy (Khalil & Er, 2023). Exacerbating the issue, findings indicate that even specialised plagiarism software designed to flag text generated by AI models is not entirely reliable, with instances of failure to flag such content (Katz et al., 2024; Wen & Wang, 2023). This contributes to the increasing challenge of plagiarism detection and highlights the risk of students employing AI chatbots as an easy shortcut to academic success with minimal effort. Nevertheless, it is worth noting that some students may use AI tools like ChatGPT not to cheat on assessments, but as a learning tool to enhance their writing skills and and acquire deeper insights into practical problems. For such cases, guidelines and regulations from national authorities of fair and responsible AI use in education remain unclear, and future efforts should be put into establishing strong ethical frameworks and enacting policies to govern the use of generative AI in assessment and educational practices.

Conclusion

The objective of this research attempted to investigate the opportunities and challenges of ChatGPT in education. Following a careful examination of the use of ChatGPT, opportunities and challenges, the integration of emerging AI tools in education has been recommended. However, ethical considerations and the development of competences among educators, students and other stakeholders are required to ensure responsible and ethical use of AI in education. This needs individuals to develop a basic understanding of AI systems, critically evaluate the reliability and accuracy of AI-generated content, adapt to changes arising from AI implementation, and engage thoughtfully with the ethical implications of AI use in educational settings.

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