

BENEFITS AND CHALLENGES IN USING AI-POWERED EDUCATIONAL TOOLS

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Abstract

The introduction of large language model tools, such as Open AI's ChatGPT in November 2022, has sparked considerable discussion on the impact of artificial intelligence (AI) in education. Educators in both K-12 and post-secondary settings began to integrate AI in their classrooms during ongoing discussions about ethical technology use, maintaining academic integrity, safeguarding personal information, and other potential concerns. This poster discusses the current state of AI in education, exploring the various applications of AI in the classroom, the benefits and challenges that come with it, and the potential impact on students and educators. It highlights the role of AI in supporting personalized learning experiences, providing adaptive assessments, automating administrative tasks, and enhancing teaching and learning outcomes. Additionally, this poster examines the need to create effective university policies for AI to promote the ethical and responsible use of AI, reduce legal risks, and ensure a safe and inclusive learning environment for all students.

Keywords: *Large language model tools, post-secondary education, artificial intelligence policies.*

1. AI use in education

As technology continues to evolve, AI is increasingly being incorporated into various tools and applications. Some of the existing technologies that integrate elements of generative AI are captioning, transcription, proofreading, and word prediction tools, while emerging generative AI tools have the ability to grade, provide feedback, produce natural language, create images and art based on natural language descriptions, and real-time sign language translation.

Since ChatGPT was officially launched on November 30, 2023, it is unrealistic to expect to find any published peer-reviewed research that presents a comprehensive review on the use of generative AI in education. According to a rapid review by Lo (2023) of 50 academic articles published between January 2022 to February 2023 and discussing ChatGPT in the field of education, ChatGPT's performance varies across subject domains. The findings of the review also suggest that ChatGPT could assist instructors with teaching preparation (i.e., generating course materials, providing suggestions, and translation) and assessment (i.e., generating assessment materials and evaluating student performance). ChatGPT has also the potential to assist students with learning (i.e., answering questions, summarising information) and assessment (i.e., providing feedback, exam preparation).

Wu & Yu (2023) conducted a meta-analysis of 24 studies examining the effects of AI chatbots on students' learning outcomes and the moderating effects of educational levels and intervention duration. Study results revealed a statistically significant large effect of AI chatbots on overall learning outcomes, e.g., learning motivation, learning self-efficacy, and learning interest. In addition, higher education students experienced a statistically significant large effect of AI chatbots when compared to K-12 students. Further, short interventions with a duration of less than ten weeks employing AI chatbots tended to have a large and statistically significant effect on students' learning outcomes than long interventions with a duration of ten weeks or longer.

Tlili and colleagues (2023) investigated concerns about the use of chatbots for educational purposes. The researchers employed social network analysis of tweets, content analysis of interviews, and investigation of user experiences. While the study findings show that there is a general openness and enthusiasm regarding the use of ChatGPT among early adopters, educators need more guidelines on how to cautiously and safely incorporate chatbots. Given the increasing popularity of chatbots in education, it is essential to consider new pedagogical approaches that can effectively accommodate this modern educational tool. Additionally, upskilling competencies have emerged as a crucial aspect of this shift,

highlighting the need to develop curricula that can enhance both teachers' and students' competencies in dealing with the current and future advancements of chatbots.

Educators are utilizing repositories such as Social Science Research Network (SSRN) and arXiv to disseminate information on how instructors could use the capabilities of AI to improve students' learning, e.g. writing of prompts and assignments (Mollick & Mollick, 2022). Social media, such as LinkedIn, Twitter, and personal blogs offer many practical guides on using chatbots in education.

The integration of generative AI in education is an exciting area of research that has the potential to revolutionize the way we teach and learn. While studies have shown the positive effects of AI chatbots on students' learning outcomes, it is important to consider the concerns and challenges associated with their use. Educators must develop pedagogical approaches and upskill competencies to maximize the benefits of chatbots in education while ensuring their safe and ethical use. With continued research and innovation, generative AI tools, such as ChatGPT, have the potential to transform the future of education.

2. Ethical and responsible use of AI in education

The use of ChatGPT and other AI technologies in education has brought about concerns regarding accuracy, reliability, and plagiarism prevention (Cotton, Cotton, & Shipway, 2023; Lo, 2023). These issues may be exacerbated by the potential biases that can be present in AI systems. Bias is a subjective and often unconscious preference or prejudice that is reflected in the way information is processed and presented. There are different interpretations of what constitutes bias, how it is created, and how it can be removed from AI systems, making it an important topic of discussion in the science community.

The algorithms and data used to create AI can modify the way we represent and interact with ideas, which is important for learning. If we don't ensure the technology is fair and unbiased, it can continue perpetuating existing problems and inequalities (Johri, 2022). In response, post-secondary educational institutions must go beyond simply providing AI access and strive for a solution that works equally well for everyone. In McDermott's presentation during the Artificial Intelligence Webinar Week in March 2023, organized by Quality and Qualifications Ireland in association with the National Academic Integrity Network (NAIN), McDermott discussed the ethical use of AI through a social justice lens. Creating fair generative AI, including minority experiences, and challenging "standard" English are seen as some of the major social justice concerns with the current state of generative AI.

There is a significant need to involve people with disabilities in the development phase of AI software and technology that is intended to serve people with disabilities. According to the Alan Turing Institute (2019) a roadmap that considers ethical issues around AI and studies the gaps in digital accessibility is yet to be developed.

The European Network for Academic Integrity (ENAI) Recommendations on the Ethical Use of Artificial Intelligence were recently published in the International Journal for Educational Integrity (Foltynek et al., 2023). These recommendations aim to assist the academic community in shaping educational policies, pedagogy and practice regarding the skills and knowledge needed for the ethical use of AI tools. Addressing the ethical issues surrounding the use of AI in education is essential to ensure that it is used in a fair and equitable manner.

3. Academic integrity and AI

AI has the potential to transform academic practices, however it is also seen as a threat to academic integrity. Students could use AI-powered tools to write academic papers and assignments that appear to be genuine but in fact, are generated by AI. Students could also employ AI-powered tools that automate parts of the research process, i.e., locating peer-review sources and summarizing their key findings. AI-powered tools are seen as having the capability to pose a risk to the authenticity of online exams. Susnjak (2022) investigated the capability of ChatGPT to generate text and perform higher-order thinking tasks. ChatGPT was tasked with (1) generating critical thinking questions, based on a scenario, that is suitable for undergraduate students across different academic fields; (2) asking to answer the generated questions; and (3) asking to critically evaluate the answer. The following assessment criteria were applied to the responses provided by ChatGPT: relevance, clarity, accuracy, precision, breadth, depth, logic, persuasiveness, and originality. Response analysis showed that ChatGPT can demonstrate critical thinking abilities and produce remarkably realistic text with minimal guidance, posing a possible risk to the authenticity of online exams. In recent months Turnitin and Cadmus, Internet-based plagiarism detection services, added AI writing indicators to detect text that has a high likelihood to be AI-generated to safeguard academic integrity.

Considering that AI is here to stay the question becomes how we can best teach our students. The successful use of AI is dependent on the post-secondary institutions developing policies and procedures, training, and support around the humane and responsible use of AI.

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