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The Artificial Intelligence in Education: New Possibilities and Challenges

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Abstract: It can be reasonably argued that the integration of artificial intelligence into the educational process has the potential to confer several advantages upon learners. The results of the literature review indicated that artificial intelligence can be effectively utilized to develop personalized learning programs, reduce the workload of teachers, and provide immediate and effective feedback and evaluation. Concurrently, ethical concerns about data privacy, prejudice, and the teacher-student dynamic emerge. Consequently, the integration of AI in education necessitates a comprehensive approach on the part of those responsible for formulating educational policy.

Keywords: artificial intelligence, ethic

Introduction

The rapid advancement of technology and the increasing digitization of our daily lives present novel challenges for educational systems. The efficacy of traditional teaching models is increasingly called into question, particularly considering the demands and needs of modern students. It is incumbent upon educators to adopt and implement contemporary pedagogical strategies that motivate

students while simultaneously equipping them with the requisite skills for their social and economic well-being. The considerable advancements in the domain of artificial intelligence over the past two years have furnished educators with an array of tools to facilitate the delivery of quality education in alignment with the sustainable development goals (SDGs) adopted by the United Nations (UN) in 2015. The integration of artificial intelligence into the field of education has the potential to enhance the efficacy of pedagogical practices. By enabling students to learn at their own pace and identify their weaknesses, AI can facilitate more personalized learning pathways. This, in turn, can reduce the overall workload of teachers, allowing them to devote more time to more creative and essential aspects of their teaching, as well as to more objective evaluation (Rizvi et al., 2023). In this context, there is a clear need for training teachers in artificial intelligence issues. This will enable them to utilize the technology as a tool to enhance their work, while also addressing any potential ethical concerns that may arise.

It appears that artificial intelligence is now inextricably linked to the field of education, offering the potential for a quality education that will enhance people's lives and facilitate sustainable development. This raises the question of what possibilities artificial intelligence offers teachers in terms of integrating techniques and practices in the educational process, and what ethical concerns are raised in this context.

Results

The results demonstrate that artificial intelligence has permeated the field of education, offering a multitude of tools and novel pedagogical avenues for teaching and learning. These developments have shaped the practices of both teachers and students. The analysis of the survey data was conducted by Hwang et al. (2020), and four key roles of artificial intelligence in the field of education were identified. These are: a) intelligent tutor through the intelligent tutoring systems developed by creating personalized teaching programs, assessment or real-time feedback; b) intelligent tutee through the development of artificial intelligence models and techniques that are capable of learning knowledge and experience from interaction with humans, c) intelligent learning tools or partners that assist students in developing higher-order thinking skills (inference and prediction), and d) policy-making advisors for the comprehension and more efficacious resolution of educational policy issues at the macro and micro levels. One of the most significant advantages of artificial intelligence in the field of education is the ability to personalize instruction. In this context, the teacher becomes more "effective", even in classes with many students, as they can understand the psychological and learning needs of each student individually, and thus be able to shape the corresponding programs (Seldon & Abidoye, 2018, as cited in Reiss, 2021). However, Reiss (2021) proposes that attention be directed towards this "effective" computer educator, as the interaction and communication between all parties involved in the process is what ultimately fosters critical thinking and the generation of novel ideas. In their study, Rizvi et al. (2023) suggest that artificial intelligence-based learning interventions can assume a variety of forms, including games and interactive programming, and can be adapted to meet the specific educational requirements of students. The results of the literature review indicated an improvement in cognitive and

affective learning outcomes. The substantial benefits of artificial intelligence in education were similarly identified by Kamalov et al. (2023). In conducting their research, the authors employed the scoping review methodology. The implementation of personalized learning and intelligent teaching systems has been demonstrated to enhance learning outcomes. Automated grading allows educators to devote more time to their students while fostering more qualitative and supportive teacher-student collaboration. In recognition of the efficacy of feedback as a strategy for improving learning outcomes, Dai et al. (2023) explored the potential of pre-trained language models (e.g., ChatGP) in enhancing feedback processes in higher education. Their findings indicated that ChatGP enables educators to offer detailed, individualized feedback to a greater number of students in a shorter timeframe, while ensuring the reliability of assessment. Moreover, the focus on the process-oriented feedback fosters the growth and advancement of learning competencies. In a survey conducted by Liu et al. (2023) on 450 students through questionnaires and focus groups of 13 students, it was found that language models (e.g., ChatGP) are considered to be of great importance by students, as they facilitate the summarizing, explaining, suggesting and conversing with others on difficult topics. The students surveyed regarded artificial intelligence (AI) as a significant challenge for their future, intending to learn to utilize it effectively in their daily lives.

In a qualitative instrumental case study, Tili et al. (2023) examine the impact of ChatGP in an educational context. The findings illustrate the integration of artificial intelligence into the educational process, whereby it offers a constructive elucidation of complex subjects in a readily comprehensible language, prompt feedback, and a reduction in the workload of educators.

The literature review and research data analysis conducted by Chan and Tsi (2023) corroborate the existence of a complementary relationship between artificial intelligence and teachers. Technologies have the potential to shape interactive and personalized learning environments that facilitate enhanced learning outcomes and reduce the administrative burden on teachers, while also providing objective assessment. The researchers highlight that artificial intelligence has facilitated a learner-centered approach by enabling the creation of personalized programs that allow students to progress at their own pace.

In addition to the advantages of artificial intelligence in the learning process, the research identifies challenges and ethical issues that must be addressed so that the use of the tools is reliable and effective. In a study published in 2022, Nguyen and colleagues conducted a thematic analysis of the guidelines set forth by international organizations to define the ethical principles that should be upheld in the context of artificial intelligence in education. The study identified seven fundamental principles that should be upheld to ensure the moral use of artificial intelligence in education. These are: the principle of governance and stewardship; the principle of transparency and accountability; the principle of sustainability and proportionality; the principle of privacy; the principle of security and safety; the principle of inclusiveness; and the principle of a human-centered approach to AI. In a recent study, Kamalov et al. (2023) emphasize the importance for educational policymakers to consider several

ethical issues, including data privacy and security, bias and discrimination, plagiarism, and the teacher-student relationship, to ensure the ethical implementation of artificial intelligence in education. In their study, Rane et al. (2024) employed a combination of literature review, bibliometric analysis, and keyword analysis to investigate the integration of artificial intelligence (AI) in the contexts of "Education 4.0" and "5.0". The findings revealed concerns regarding data privacy, the potential for bias in AI algorithms, and their possible impact on teacher-student relationships. Furthermore, a balanced approach between technology and ethics was emphasized, ensuring a responsible and effective integration of AI into personalized and adaptive learning environments.

Conclusions

Notwithstanding the robust reservations that have been expressed, it is indubitable that artificial intelligence has the potential to augment student learning and the work of teachers, thereby establishing the foundations for quality education and sustainable development. In this context, issues concerning data privacy and security, prejudice, discrimination, and the teacher-student relationship emerge, underscoring the necessity to adopt ethical principles that ensure the successful integration of artificial intelligence in education. Cooperation and concerted efforts are required from all those involved in the educational process to create an educational system that is efficient, fair, and adapted to the needs of modern society.

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