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EXPLORING THE POTENTIAL AND CONSEQUENCES OF AI AND CHATGPT IN EDUCATIONAL SETTINGS

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Abstract
The central question of this article is formulated as follows: "What opportunities and challenges are emerging from the development and implementation of artificial intelligence systems within the educational environment?"
To explore this question, the present thesis employs a narrative review method, analyzing current research, perspectives, and scholarly literature on AI and ChatGPT (and, in a broader context, on AI and large language models — LLMs).

Keywords: Artificial intelligence, ChatGPT, educational setting, machine learning.

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Introduction

Over the last decade, the world has experienced a rapidly changing landscape in educational practices, primarily due to technological advancements. Among these technologies, arguably the most impactful has been artificial intelligence (AI). Recent progress and expansion in machine learning have led to the generation of sophisticated digital content, like generative artificial intelligence (GAI), capable of assisting education. GAI is an unsupervised or partially supervised machine learning framework that generates outputs using statistics and probabilities. Through advances in deep learning (DL), the generative AI creates artificial relics using existing digital content, such as, but not limited to, video, images/graphics, text, and audio, by examining training examples and learning their patterns and distribution [1]. The extant literature has identified two major types of generative AI-Generative Adversarial Networks (GAN) and Generative Pre-trained Transformer (GPT). Generative Pre-trained Transformer (GPT) models have mainly been discussed during the past six months due to the advent of OpenAI ChatGPT, a technology often defined as a world changer. GPT technology uses a large amount of publicly available digital content data (natural language processing) to process and produce humanlike text and can exhibit creativity in writing texts convincingly on most topics. GPT models can even engage customers in humanlike conversation and have been successfully implemented to perform several work tasks as customer service chatbots. The latest technology development, Chat GPT, developed by OpenAI, is a versatile tool designed to streamline automated conversations and potentially make human operators redundant. The

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ChatGPT technology has been through several iterations [2]. GPT-3 has 175 billion parameters, which is 10 times more than any previously developed language model. GPT-3 has become the basic NLP engine that runs the recently developed language model Chat-GPT, which has attracted the attention of various fields, including, but not limited to, education and health. Following its launch on 30 November 2022, ChatGPT amassed over one million subscribers in just a week. More recently, an even newer and more powerful model, GPT-4, was released on 14 March, featuring a staggering 170 trillion parameters, representing a staggering increase in computational processing capacity compared to the earlier model. Moreover, as a demonstration of its language prowess, OpenAI declared that its LLM can pass the US bar exam in the legal profession with results in the ninetieth centile, compared with the 10th centile for the previous version of ChatGPT [3]. However, the technology remains limited in its accessibility, requiring users to pay a subscription fee and adhere to quantitative usage restrictions. While the achievements of this technology have been remarkable, the scientific community has expressed frustration due to OpenAI's lack of transparency regarding the training methods and data sources employed for the model, as well as the inner workings of GPT-4 beyond its user interface [4]. This new era of AI-driven revolutions has been defined by some authors as "the new AI gold rush", emphasizing how all the most prominent players in IT are currently rushing to develop better and better models to beat the competition, in a freshly created fast-phased market. These AI models' impact, especially ChatGPT's remarkable possibilities of use in the education sector, has led to a mix of emotions among educators [5]. This breakthrough in AI technology seems to be overhauling current educational norms, leading to debates. Some educators see ChatGPT and similar AI as a progressive step toward the future of education and research. In contrast, others are doubtful and view it as a potential danger, with a risk of leading to a decrease in educational activities and fostering laziness among teachers and students due to reduced analytical skills. Recently, as the topic has gained attention in the media, several scientific authors have attempted to evaluate possible possibilities and problems related to the advent of AI technologies in the sphere of education,and the UNESCO has also published a report attempting to discuss the main challenges and the emerging ethical implications of AI in higher education [6].

Possible actions and mitigation strategies in response to the impact of ChatGPT

The urgent need to address the impact of ChatGPT on the educational sector cannot be overstated, and the need for immediate action has been proposed. There is a pressing demand to adapt assessment practices and institutional protocols to manage the issues brought to the fore by the proliferation of AI-generated content in academic work [7]. Before the rollout of GPT-4 in March 2023, educators could carefully alter their exam designs by introducing multimedia resources (e.g., images and charts) to mitigate the possibility of the assignments being performed entirely by AI, as ChatGPT 3.5 was not able to process visual or video content, thereby forming a challenge to students who attempted to utilize it to cheat. However, this has changed with the latest iteration of the technology (GPT-4), as the AI system is now designed to process visual inputs as well (the developers have announced such a feature, but it was still

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not implemented for regular users as of 28 May 2023; https://openai.com/product/gpt-4, accessed on 28 May 2023).

This necessitates the exploration of alternate strategies by educators involving the integration of digital-free components into their evaluation tasks, for instance, oral presentations, interviews, and written exams performed without the use of digital aids. Such nondigital components of an evaluation will require students to demonstrate their competencies live and directly without external tools. At the broader institutional level, there is a call for AI-based plagiarism detection tools to be provided to educators, and definitive guidelines need to be put forth on the acceptable use of ChatGPT in the academic setting. Investing in training educators and informing students may be a strategy, given the actual state of things, for managing the implications of ChatGPT [8]. A critical area of focus is equipping instructors with the ability to discern the use of ChatGPT in student work, a skill that can be developed with the help of AI detection tools. However, even training educators to recognize AI-generated content may be impossible. AI tools are improving at imitating human writing styles, and they will probably soon generate text that is totally indistinguishable from human writing. Therefore, such mitigation strategies may become quickly obsolete. Addressing this complex issue may require a multifaceted approach, incorporating improved plagiarism detection tools, enhanced education around academic integrity, and perhaps reconsidering assessment methods to ensure fairness and accuracy in evaluating student learning. On the other hand, educators should be educated in how to maximize the potential of ChatGPT in lesson preparation and evaluation, and students should be enlightened about the inherent limitations of ChatGPT, including its dependency on partial data, its circumscribed access to current knowledge, and its propensity to generate misleading or false information. Consequently, educators should guide students to confirm the reliability of the information sourced from ChatGPT with reliable, authoritative references like textbooks and scientific articles. More emphasis should also be placed on informing students about the university's academic integrity policies and the repercussions of academic malpractice. To achieve this, educators should proactively engage students in discussions about ChatGPT and underscore the significance of academic honesty in their courses. Despite its limitations, AI tutoring systems can still be valuable educational tools. For instance, it has been suggested that these systems could assist educators by identifying areas where students struggle, thereby helping educators to target their instruction better [9]. Despite their current shortcomings, the potential of AI systems to enhance education is significant, provided they are used in a manner that complements, rather than replaces, human educators.

Pioneering the ai evolution in education: adapting, advancing, and innovating

Artificial intelligence, with its transformative potential, will substantially influence modern education. This is especially evident in the case of generative models like ChatGPT, which could quickly become widespread among the general population. Even though there exist various debates surrounding its application and certain technological limitations, the foothold of AI in the educational sphere is here to stay, and it could quickly push extensive transformations of our teaching and learning methodologies. At the heart of the ongoing

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discourse around AI in education is the concern for its potential misuse, particularly in academic assignments. Many have proposed severe measures, such as a complete ban on AI tools like ChatGPT in school and university environments. This approach has been criticized as it may disadvantage students in schools where these tools are forbidden compared to students attending schools where they are allowed [10]. Concurrently, there is a push for developing and utilizing technologies capable of discerning AI-produced content. However, an arms race between ChatGPT and detector software could be expensive and ineffective, and these preventive measures might offer a temporary respite at best. The relentless advancement in AI technology, as evidenced by the evolution of the Open AI ChatGPT model, presents a challenge to the effectiveness of these safeguards. To further address the issue, guidelines have been proposed to help educators mitigate the risk of student dependency on AI for academic work. Taking a drastic step in this direction, the New York City Education Department (NYC) has imposed a ban on access to ChatGPT across all school-owned devices and networks, and other schools and colleges have also issued bans against ChatGPT and other AI tools. At the moment, it seems more practical to accept and integrate these technological tools into our educational structures instead of trying to hopelessly suppress their growth, which could do more harm than good to the students, according to several journalist reports. It has also been noted that banning ChatGPT use for students should be considered equal to banning calculators in math class or banning Google [11]. With giants like Microsoft planning to incorporate ChatGPT across their product range, it is only a matter of time before AI tools become a commonplace fixture in our lives. When this transformation comes to fruition, educational institutions might face considerable challenges in retrospectively implementing policies that foster the safe and effective use of AI tools like ChatGPT.

The development of AI also brings forth the question of rethinking assessment strategies in education. While it is premature to draw concrete conclusions, it is clear that the current assessment methods might need an overhaul to keep pace with AI's influence. Existing research illustrates that many educators struggle to design effective assessment practices that promote learning [12]. Therefore, there is a critical need for professional development in this area, enabling teachers to harness the capabilities of AI tools like ChatGPT to enhance learning outcomes. As artificial intelligence becomes increasingly embedded in the professional realm following a university education, preparing students with the requisite skills to thrive in an AI-dominated future is essential. To this end, integrating AI applications, such as ChatGPT, in educational settings can be a significant step. By offering students a hands-on experience with these tools, we can foster their understanding and application meaningfully while outlining their limitations and keeping pace with technological advances. Negotiating the swift transformations prompted by AI involves navigating several intricate dimensions. Foremost among these is ascertaining effective strategies to employ ChatGPT and analogous AI tools to enrich educational experiences and designing customized training modules that accommodate both teachers and students, aiming to maximize the benefits of AI tools in amplifying teaching and learning. Furthermore, incorporating these AI tools within teacher training programs can equip the next generation of educators with the knowledge and skills to utilize these

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technologies optimally in their classrooms. It is plausible that in the future, students without training in AI tools could find themselves at a competitive disadvantage in the job market compared to their peers with extensive exposure and practical experience with these tools. Therefore, it becomes paramount to promptly establish an educational framework that both employs and scrutinizes these tools for the benefit of students. Beyond the confines of the classroom, it is crucial to confront and address the potential impact of AI on the digital divide. AI tools could either narrow this chasm by facilitating universal access to learning resources or intensify the divide by disproportionately benefiting those with superior access to technology. We need a cooperative, cross-disciplinary approach to navigate these potential challenges and capitalize on AI's opportunities.

Forming a mutually beneficial alliance between policymakers, researchers, educators, and technology experts-including private companies developing AI tools—can be pivotal in steering the future of education. The collective endeavor of these groups is crucial in guaranteeing the secure and productive deployment of continually evolving AI tools. This collaboration can foster innovative pedagogical strategies, improve students' learning outcomes, and create a well-prepared educational system to meet future demands in the job market.

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