Redefining Learning: Evaluating the Uses of AI in Education Systems

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Abstract

The Humanities and Arts Requirement was completed with a sequence of courses in writing, rhetoric, and a breadth of music that culminated in a research paper in a seminar on AI and writing. The paper examines how AI has been integrated into education systems, and explores the potential benefits of AI in classrooms, such as personalized learning experiences and enhanced teaching practices. To ensure that AI is effectively integrated into classrooms, the challenges of ethical use and the role of human teachers must be addressed. This paper advocates for a balanced usage of AI while upholding the importance of human-centric skills in education.

Introduction

With the recent emergence of AI technology, it's difficult to say whether it will become a major benefit or detriment to humans. This leaves us questioning how society will function in the future with the existence of this technology. ChatGPT, being one of the most known AI technologies currently in the conversation, has an incredibly vast range of capabilities including sophisticated human-like writing, coding, and image generation. As this technology becomes more advanced day by day, more people are tapping into its limitless potential. However, alongside these prospects follow legitimate concerns with the widespread adoption of AI. As AI technology continues to evolve and integrate further into our daily lives, it creates challenges on an equal scale to its opportunities for society. For years, people have feared the existence of AI and its threat surrounding privacy, ethical uses, and displacement of jobs (Cardon et al., 2023). We live in a time where AI can complete your homework, write your emails, or even craft arguments from any sort of prompt. While these new developments can be exciting for some, there are others who would argue that it will cause people to lose sight of their personal creativity and critical thinking. One facet of this concern revolves around the growing dependence on AI, which risks transforming individuals into less capable thinkers. This shift could impede peoples' natural ability to generate ideas and solutions on their own. The same discussion has been made since the creation of the Internet (Yadav, 2024). People have long feared that children growing up with the Internet would suffer consequences in cognitive development. These worries arise from concerns that instant access to information would cause individuals' capacity to think critically, exercise creativity, and problem-solve independently to decline. To some extent, these concerns have been proven valid as access to the Internet has taken physical, mental, and emotional tolls on countless people over the years. Will AI, an innovative technology of similar magnitude, produce similar consequences?

On AI and Education

As this debate unfolds, one area of particular interest is the impact of AI on education. When it comes to this topic, most of us readily agree that AI has immense potential to improve teaching methods and learning experiences in classrooms (Alam, 2021). Where this agreement usually ends, however, is on the question of how the convenience and automation offered by AI could lead to a decrease in students' motivation to learn and engage with classroom material (Cardon et al., 2023). Whereas some teachers and professionals are convinced that AI is a headache to deal with, others maintain this to be an exciting opportunity to incorporate ground-breaking technology into their practice (Holmes, 2022). For teachers and administrators, it is their main responsibility to establish clear views of expected and ethical use of AI in classrooms. In May 2023, many large school districts including New York City Public Schools blocked access to ChatGPT from school Wi-Fi networks (Ta & West, 2023). This no-use policy reflects an initial negative sentiment towards AI use in education systems. My own view is that banning AI use in classrooms outright is an incredibly close-minded decision. Though I concede that AI has many risks to be considered, there are many benefits as well as opportunities that outweigh the negatives. For example, many English as a Foreign Language (EFL) learners often struggle with translating their ideas into English when attempting to complete a writing task (Gayed et al., 2022). Studies show that AI-based writing assistants such as AI KAKU help EFL students in their writing performance. Although some might object that AI writing assistants and usage of predictive text has a negative effect on learning outcomes, I would reply that it is simply an approach to collaborative learning. Students who engage with AI can more effectively communicate their ideas and organize their thoughts more clearly.

Ultimately, what is at stake here is the advancement of education systems as a whole. For far too long, students have expressed disinterest and contempt for schools. This stems from systemic

issues within the educational framework itself, as traditional teaching methods prioritize short-term memorization and standardized testing. As a result, students are taught that learning is a stressful and tedious endeavor which stifles motivation and intellectual growth. This cannot be the mindset future graduates should hold onto, as it does not effectively prepare them for when they enter the workforce and other institutions. AI provides an opportunity to completely revolutionize the way students can learn and shape our schools into an education system that nurtures lifelong learners. The U.S. Department of Education Office of Educational Technology supports the use of technology to improve teaching and learning, stating several key insights for using AI in schools:

(1) AI enables new forms of interaction,

(2) AI helps educators address variability in student learning,

(3) AI can enhance feedback loops, and

(4) AI supports powerful forms of adaptivity (Cardona et al., 2023).

The debate surrounding the integration of AI into education brings to attention both real concerns as well as extensive opportunities with this emerging technology. While there is widespread acknowledgement of AI's potential to enhance teaching practices and improve learning outcomes, more pessimistic views persist regarding its negative impact on student development and engagement. As we continue to navigate these uncharted territories, it's important for educators and administrators to approach AI integration with an open mind, weighing the risks and opportunities in a balanced manner. By leveraging AI to enhance teaching practices and individualized learning, we can pave a path towards a more effective education system that prepares students for success in this increasingly digital world.

Potential for AI to be used in classrooms

The integration of artificial intelligence in classrooms holds significant potential to benefit both students and teachers. Learning can be revolutionized by AI to positively change how students learn and engage in classrooms. In discussions of today's education system, one controversial issue has been whether school is a waste of time, and how necessary formal schooling is for so many years of our lives. Whereas some are convinced that school is a vital part in becoming successful in the future, others contend that school is, for the most part, filled with uninteresting classes that yield little to no benefit in the long run. In Wolk's view (2011), standardization and uniformity are the main issues with the American education system design. He argues, "today's students are the most diverse in history… they learn at different rates and in different ways, have different problems, talents, and aspirations. Imposing more standardization and uniformity on them is counterproductive" (p. 25). According to this view, the current strategy when it comes to conventional schooling is ineffective and flawed. Insisting that all students be treated the same way, teaching them the same subjects at the same time, is impractical. My own experience with the current education system yields a point that is similar. Conventional public schools have often given me the impression that if you're not able to learn in a specific way, then you're going to be left behind. To measure student success with such structured and rigid methods does more harm than good as it ignores individual talents that aren't given the opportunity to be explored in a traditional classroom setting. As a result, I conclude that there must be significant alterations to the current education system to accommodate the variability in student learning.

Through AI, educators can predict and cater to the extensive array of learning methods that lead to success among students. This stands in contrast to the conventional method in education of tailoring for the average or predominant learning styles. For instance, AI-driven educational tools could be utilized to customize learning experiences based on individual students' proficiency

levels in English, offering enhanced assistance that caters to the diverse skills and requirements of English language learners (Cardona et al., 2023).

However, despite the growing availability of AI-assisted tools in the commercial market, there has yet to be one that is specifically student-focused and concretely proven to be effective for learning. Some of the current most promising technologies include: intelligent tutoring systems, chatbots, and automatic formative assessment applications (Holmes and Tuomi, 2022). Intelligent tutoring systems (ITS) are the most well-funded and common applications of AI in education. These systems typically offer computer-based tutorials capable of guiding students through various subjects in a step-by-step manner. An ITS allows each individual student to receive a tailored sequence of activities, quizzes, and lessons adapted to their specific needs. Additionally, as students interact with the system, vast amounts of data are collected including typed responses, answer patterns, and items clicked. This data is then analyzed by the ITS to determine next steps and create a personalized learning pathway (Steenbergen-Hu and Cooper, 2014).

Plagiarism

A discussion of AI in classrooms would not be complete without a mention of plagiarism, specifically relating to ChatGPT. The emergence of this new AI chatbot has garnered significant attention within education systems, with the bulk of scholarly research focusing on its implications for academic integrity (Cardon et al., 2023). A number of these studies suggest significant challenges in distinguishing between content produced by students and that generated by AI (Swiecki et al., 2022). In an exploration of generative AI's potential in educational applications, Qadir (2022) poses many prompts to ChatGPT in both technical and creative writing-oriented contexts. He found that ChatGPT has the ability of effectively producing university-level work for tasks such as code generation, answering conceptual questions, persuasive writing, and more. These impressive capabilities, however, also raises ethical concerns with the potential for unethical and dishonest use by students. To gauge the sentiments of experts on this issue, a survey was conducted with a sample of 343 business communication instructors on AI-assisted writing (Cardon et al., 2023). The participants were asked to answer:

I am concerned that AI-assisted tools (like ChatGPT) will…

- Make it more difficult to assess student learning.
- Lead to more plagiarism.
- Lead to less critical thinking among those who use it.
- Lead to less creativity among those who use it.
- Lead to lower perceived authenticity of the writer.
- Lower writing skills among those who use it.
- Lead to lower perceived credibility of the writer.

on a Likert scale from 1=strongly disagree to 7=strongly agree. Though the majority of instructors agreed among all categories, the category with the highest consensus was “Lead to more plagiarism” with 81.7% in agreement. These results signify that the greatest challenge when it comes to ChatGPT-like AI tools is ensuring academic honesty and integrity. Despite these concerns, roughly 80-85% of the instructors also believe that AI-assisted writing will be useful in the workplace and enable professionals to complete tasks more quickly. If these instructors are right that AI has useful applications in the workplace, as I think they are, then we need to reassess the popular opinion that ChatGPT should be banned from classrooms. The value of AI in advancing individualized learning is clear. However, much like any other technology, it has the potential to be misused. Drawing a parallel, since the invention of cars, hundreds of millions of people have benefited greatly in terms of comfort, efficiency, and opportunity. Despite these advantages, it is tragically noted that car accidents stand as the leading cause of death in the United States among ages 1-54 (Centers for Disease Control and Prevention, 2023). Banning cars from being used is out of the question, but we can’t have cars without car accidents; much like we can’t have ChatGPT without the inherent risk of academic dishonesty. The discussion should then be focused on how we can minimize these risks without dismissing the benefits of this new technology.

Teaching AI Literacy

According to Flathmann et al. (2021), without a proper model for ethical human-AI teamwork processes, “AI technology may not only underperform, but ultimately harm the society they were designed to help”. According to this view, humans may misuse AI if they are without a model to guide them. In sum, then, the issue is whether humans can learn a set of ethical practices to guide their thinking with AI, or the advancement of AI will negatively impact humans and society. Flathmann et al. goes on to suggest that ethical human-AI teamwork must begin when you are a student to establish an ethical foundation early on before entering the workplace. I agree that educational curricula must be changed to integrate AI ethics, as people need guidance on how to be responsible. Currently, a hot topic of discussion in regards to AI ethics is students using this technology to cheat.

With standardized tests and GPA being such an important metric in our society, cheating is an act that gets incentivized, a trend which ChatGPT facilitates by making it easier than ever to do so. As a result, students will graduate to find jobs only to continue cutting corners and avoiding extra work. I have always believed that the path with more successes than failures leaves less room for growth. What schools should strive to become is an institution that develops good habits of mind and behavior, equipping future generations with the tools necessary to become ethical-minded, productive individuals in the real world.

Given the prominence and widespread usage of AI in both education and workplaces, the cultivation of AI literacy becomes the forefront in preparing individuals for the challenges and opportunities of the new AI age. One of the definitions of AI literacy Ng et al. (2021) provides is: “[Knowing] the basic functions of AI and how to use AI applications in everyday life ethically” (p. 505). This places emphasis on the necessity for individuals to not only possess

technical proficiency, but also to develop ethical awareness in interactions with AI technologies. As AI continues to shape various aspects in our society, integrating AI literacy in education systems becomes necessary to ensure students engage with AI by responsible and ethical means, thus contributing to a more informed and ethical AI-driven future.

Limitations of AI in classrooms

While the integration of AI holds great promise for improving education systems, it's important to also acknowledge and address its limitations within classroom settings. Without careful consideration and oversight, AI technology may unintentionally cause harm or underperformance. The common way of thinking about AI has it that critical thinking and creative abilities will be replaced in the long run. To that end, the reliance on AI-driven educational tools raises concerns that surround the diminishing role of human teachers and interpersonal interactions in the learning process. Educational robots are even beginning to enter the conversation as they are able to be equipped with multi-disciplinary knowledge and a vast array of teaching applications (Louis and ElAzab, 2023). This begs the question of whether human teachers should be replaced in favor of robots that potentially are more capable. My feelings on the issue are mixed. Although I do see robot teachers having evident benefits in classroom settings and agree they should be used in the fullest capacity, I cannot deny the vital role that human teachers also play in student learning. While AI technology and robot teachers can remove barriers to access information for students, it cannot completely replace the nuanced understanding, empathy, and guidance that human teachers offer. As Qadir (2022) puts it, "Paradoxically, with advancing technology, classical human skills and liberal arts such as critical thinking, communication, and problem-solving become more rather than less important. These skills are essential for being able to effectively use and analyze information and technology, as well as for creating original and innovative solutions to complex problems" (p. 8). I agree that human skills become more valuable as technology advances, a point that needs emphasizing since so many people still believe their jobs will be replaced by AI in the near future. Rather than having robot teachers run classrooms, it would perhaps be more effective to strictly implement AI assistants. The issue with this, however, is that many teachers lack the necessary training to

effectively utilize AI. Toyama (2011) argues that historically, there has been a repetitive cycle of technology in education that results in poor integration and lack of educational outcomes; with his main points being that (1) technology has a huge opportunity cost in the form of more effective non-technology interventions, and (2) many good school systems excel without much technology. This view asserts that AI should not be used in education given the patterns of failure we've seen from computers, mobile devices, etc. Alam's (2021) view, however, contrary to what Toyama has argued, is that "academics have benefitted from technological advances that have improved the efficiency and efficacy of classroom instruction" (p. 1). While I wholeheartedly agree that technology has benefited the education system more than what Toyama gives credit for, I also agree with him that it cannot serve as a replacement for good teaching. In order for AI assistants to succeed in classrooms, teachers must be trained to use them professionally. Until then, we should await more substantial evidence of AI being a worthwhile investment to our education systems.

Conclusion

In conclusion, the integration of AI in education systems presents both exciting opportunities as well as significant challenges. While AI holds great promise for revolutionizing teaching practices and improving learning outcomes, the adoption of AI-driven educational tools raises concerns around effective implementation and the potential displacement of human teachers. With that being said, it is also crucial to recognize that AI technology cannot exist without humans' innate skills to think critically, problem solve, and communicate. By embracing AI technology while also maintaining the essential role of human teachers, we can create a more dynamic and effective learning environment that empowers students to thrive in the AI age.

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