



The Impact of Artificial Intelligence on Education and Societal Development

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Abstract

Artificial Intelligence has become one of the most transformative technologies of the 21st century, significantly influencing education systems and societal development. This article explores the current challenges associated with the integration of AI in education, including digital inequality, ethical concerns and the lack of teacher preparedness. Furthermore, it highlights practical solutions such as policy reforms, digital literacy enhancement and the development of inclusive AI based learning environments. The study emphasizes that effective implementation of AI can foster innovation, improve learning outcomes and building a more equitable and sustainable society.

Key words: artificial intelligence education, innovation, digital transformation, societal development, challenges, solutions.

Introduction

In recent years, Artificial Intelligence has rapidly entered various sectors, including education, healthcare and governance. In the context of education, AI offers innovative tools such as intelligent tutoring systems, automated assessment and personalized learning environments. These advancements have the potential to reshape traditional teaching methods and improve access to quality education. However, alongside these opportunities, several challenges must be addressed to ensure the sustainable development of society. One of the most pressing issue is the digital divide, where unequal access to technology creates disparities among students. Many developing regions still lack the infrastructure necessary to implement AI-based education systems effectively.

Another significant concern is ethical issues, including data privacy, algorithmic bias and the potential misuse of AI technologies. Without proper regulations, AI systems may reinforce existing inequalities rather than eliminate them. Additionally, there is a lack of teacher readiness. Many educators are not adequately trained to use AI tools, which limits their ability to integrate these technologies into the classroom effectively. Today the fast advancement of AI technology imposes a great challenge to educators and government. Below we list and discuss some challenges that educators are facing. 1. Will students become more intelligent or less intelligent if AI is used in education? Internet addiction has become a problem for students. Many students spend increasingly more time on social networks such as TikTok, YouTube, Facebook, IG, etc. Time is limited to 24 hours a day, so if a student spends much time socializing with peers, then they have less time for studying.

If students are using ChatGPT to generate assignment solutions due to lack of time, then the question is: would the use of AI to complete homework assignments make a person more intelligent or less intelligent? This is hard to determine, so the challenge for educators is: how can we ensure students learn and become more knowledgeable and more intelligent when AI is involved in education? 2. Can we end up with a better society if AI is used in education? People usually tend to follow the majority, but the majority is not necessarily always right. Internet does contain fake news, false knowledge, bad ideas, etc. Since AI uses Internet data to train its model, the model will exhibit bias if the data used has bias. Because AI just consists of algorithms that lack human nature and don't have human emotion or sensation, it is possible that bias, discrimination, injustice and inequalities may occur. So, the challenge for social and humanity educator is: how can one ensure the use of AI will direct our students to pursue a more righteous, just, and fair society, which will eventually point to a better society for all human race? 3. How can educators control AI and make sure it is just a tool and not the master?

From my experience as an educator, I have found that students have a tendency to find an easy way out. For example, given the choice between a difficult project or easy project, most students will prefer the easy project. Computers can help do things more quickly, even the things that we already know how to do. For example, finding details about a historical event, designing a vacation plan, helping to write a program code more quickly. Would the use of AI tool generate a mentality of dependency where individuals always ask AI to do things for them? As discussed earlier, the agents that companies and researchers are developing now are autonomous. Is it right to ask AI to come up with a better structure of human society, or to create a new law which governs our society? Is it acceptable to ask AI to come up with a way to redistribute resources among people? Is it safe to allow AI have its autonomous consciousness? The argument is, if AI can make decisions to take actions without human permission, then who is the one in charge and who is merely the tool? Who is the owner using the tool? If we allow AI to have its own 'personality', would AI want to become the leader and decision maker, rather than the tool that helps make decisions?

Instructors have established different pedagogical approaches to teaching our students. As AI subverts our ideas and affects our existing and established curriculum, how do we adapt a new approach and modify, if not totally redo, our existing pedagogical method to adjust to this new challenge? Based on the understanding of AI fine-tuning, we think the best way for an educator to equip themselves is to create their own AI tool in their teaching. For example, with RAG, an instructor can put all the 'best materials' that they know into the database so that student can use it to find useful information according to the instructor's philosophy and will. The byproduct of RAG is the instructor can embed the classroom rule, policies and regulations into the database so student can find requirements and information like exam dates, topics covered etc. As this information can be modified or updated dynamically and easily, it will save instructors time and allow them to concentrate more on pedagogic design of the curriculum. Instruction tuning can also be used to fine tune the system. We think the best format may be in the form of questions and answers. These QAs can be placed in a hub for all the instructors in that field to share. As for the STEM educators, AI agents should be created and shared so that the computation questions related to mathematics can be easily performed.

In my opinion, artificial intelligence (AI) technology has rapidly developed in recent years, transforming many aspects of modern life, from how businesses operate to how individuals interact with technology. AI encompasses a range of technologies designed to simulate human intelligence, including machine learning, natural language processing, and computer vision. As AI applications become prevalent in sectors such as healthcare, finance, and education, studying their social impacts is becoming increasingly important. AI is not just a technological innovation; it is a phenomenon that affects economic, social, and cultural dynamics.

Ethical Considerations

The societal effects of AI bring with them ethical problems and the necessity for appropriate regulations. As these systems become more integrated into daily life, the need for developing fair and responsible artificial intelligence becomes critical. Ethical guidelines need to be developed to guarantee accountability and transparency in AI algorithms and decision-making processes. Developers and organizations that employ AI technologies should consider their broader societal implications and collaborate with interdisciplinary teams comprising ethicists, technology experts, and community representatives. Implementing frameworks that encourage fairness and mitigate biases is crucial. Conducting regular audits of AI systems to identify potential biases and discriminatory effects should be a standard practice. Additionally, enhancing public awareness of AI technologies and their functioning can empower individuals to make informed choices regarding their use and help foster trust in AI systems.

Recently gaining importance, Agentic AI refers to artificial intelligence systems designed to operate autonomously and make decisions or take actions toward specific goals. Unlike traditional AI, which largely relies on human input or operates under fixed parameters, agentic AI can dynamically adjust its behavior according to its environment and experiences. Such AI systems can be applied in various fields, including robotics, autonomous vehicles, and complex gaming systems. However, the ethical and security issues related to agentic AI become even more significant, as the ability to make independent decisions can lead to misdirections or unintended consequences.

Rising Interest in AI in Education Today, many priorities for improvements to teaching and learning are unmet. Educators seek technology-enhanced approaches addressing these priorities that would be safe, effective, and

scalable. Naturally, educators wonder if the rapid advances in technology in everyday lives could help. Like all of us, educators use AI-powered services in their everyday lives, such as voice assistants in their homes; tools that can correct grammar, complete sentences, and write essays; and automated trip planning on their phones. Many educators are actively exploring AI tools as they are newly released to the public. Educators see opportunities to use AI-powered capabilities like speech recognition to increase the support available to students with disabilities, multilingual learners, and others who could benefit from greater adaptively and personalization in digital tools for learning. They are exploring how AI can enable writing or improving lessons, as well as their process for finding, choosing, and adapting material for use in their lessons. Educators are also aware of new risks. Useful, powerful functionality can also be accompanied with new data privacy and security risks. Educators recognize that AI can automatically produce output that is inappropriate or wrong. They are wary that the associations or automations created by AI may amplify unwanted biases.

To develop guidance for detach, the Department works closely with educational constituents. These constituents include educational leaders—teachers, faculty, support staff, and other educators—researchers; policymakers; advocates and funders; technology developers; community members and organizations; and, above all, learners and their families/caregivers. Recently, through its activities with constituents, the Department noticed a sharp rise in interest and concern about AI. For example, a 2021 field scan found that developers of all kinds of technology systems – for student information, classroom instruction, school logistics, parent teacher communication, and more – expect to add AI capabilities to their systems.

Through a series of four listening sessions conducted in June and August 2022 and attended by more than 700 attendees, it became clear that constituents believe that action is required now in order to get ahead of the expected increase of AI in education technology – and they want to roll up their sleeves and start working together. In late 2022 and early 2023, the public became aware of new generative AI chatbots and began to explore how AI could be used to write essays, create lesson plans, produce images, create personalized assignments for students, and more. From public expression in social media, at conferences, and in news media, the Department learned more about risks and benefits of AI-enabled chatbots. And yet this report will not focus on a specific AI tool, service, or announcement, because AI-enabled systems evolve rapidly. Finally, the Department engaged the educational policy expertise available internally and in its relationships with AI policy experts to shape the findings and recommendations in this report.

Artificial Intelligence (AI) has the ability to greatly improve education and make a positive impact on society. It supports personalized learning, provides easier access to educational materials, and increases teaching effectiveness through modern technologies and smart tools. Because of this, AI can help develop more adaptable and inclusive educational systems that satisfy the different needs of students. At the same time, introducing AI into education comes with several difficulties. Problems such as unequal access to technology, ethical issues, concerns about data security, and insufficient teacher training continue to be major barriers. If these challenges are ignored, the advantages of AI may only benefit certain groups of people and increase social inequality.

For this reason, effective measures should be taken to overcome these obstacles. Improving technological infrastructure, developing digital skills, and creating strong ethical policies are important steps. In addition, cooperation among governments, schools, universities, and technology companies is necessary to ensure the safe and responsible use of AI in education. By solving these issues and encouraging collaboration, AI can become an important tool in creating a more equal, creative, and sustainable future. In such a future, education will continue to play a central role in the development of society and the economy.

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