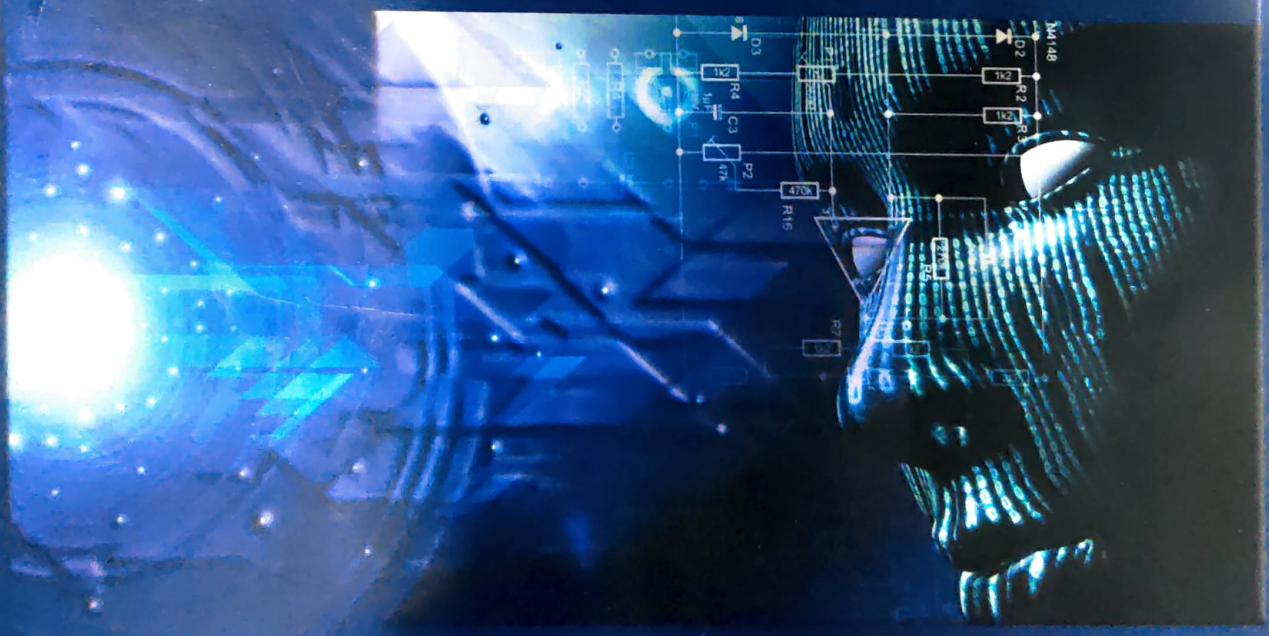
Artificial Intelligence and Digitisation in Education



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Introduction

AI can be seen as an innovation of technology that enables computers and other devices to operate intelligently. Defined as a computer system's capacity to accurately comprehend external input, acquire information from such data, and utilize those leanings to fulfil specified objectives and tasks through flexible adaptation ((Kaplan & Haenlein, 2019). AI has infiltrated all parts of existence (Chen et al., 2022). It is also referred to as human intelligence, which may be seen as the "biopsychological potential to process information to solve problems or create products that are of value in a culture" (Gardner, 1999). Multiple research and publications have extensively examined the possible advantages of using AI in the academic domain (Zhang, K. 2021; Aslan, Dignum V.2018). AI systems may identify students' learning styles and skills and give personalized suggestions and assistance to help them reach their objectives. Furthermore, AI systems may enhance online learning and make education available to students in rural locations, resulting in more equal and inclusive education (Pelletier, K. et al. 2022; Murtaza, M. 2022). Currently, Education Technology (Ed Tech) enterprises are utilizing emotional AI to measure and assess social and emotional development (McStay, 2020). The impact of AI on our future surpasses that of any previous invention in history. Individuals lacking comprehension will swiftly experience a sense of being excluded; awakening in a realm abundant with technology that increasingly resembles sorcery (Maini and Sabri, 2017). Undoubtedly, AI technology holds great significance, and its impact has been observed during the recent pandemic.

Embedding AI in Education for Improved Learning Outcomes

The inclusion of artificial intelligence (AI) and chatbots in education and research has become increasingly common in recent years, particularly by the end of 2022 (Kooli, 2023). The introduction, progress, and widespread use of technology, specifically artificial intelligence, have facilitated instructors in

carrying out their responsibilities with greater effectiveness and efficiency. These technological advancements have also extended to other areas of academia, promoting effectiveness and efficiency (Chen et al., 2020). AI has been used in education to automate administrative activities, curriculum, content production, instruction, and student learning. AI-powered web platforms and computer tools have made tasks like assessing student work, grading, and giving feedback, more efficient. Virtual reality, web-based platforms, robotics, video conferencing, audiovisual files, and 3-D technology have been used in curriculum, content development and instruction to help students learn.

Personalized Learning Experiences

AI-driven personalized learning is an educational technique that focuses on individual students and aims to tackle the problem of learner disengagement. AI provides personalized learning experiences by customizing information, interactions, and data analysis to enhance learning results. The utilization of AI and educational chatbots is increasing due to its capacity to offer a cost-efficient approach to include students and deliver a personalized learning encounter (Benotti et al., 2018). The deployment of chatbots is particularly vital in online classes with a large number of students, when providing individual help from educators to students is difficult (Winkler & Söllner, 2018). AI can enhance learning in educational settings by immediately offering students course materials (Cunningham-Nelson et al., 2019), assignments (Ismail & Ade-Ibijola, 2019), practice questions (Sinha et al., 2020), and study materials (Mabunda, 2020). Furthermore, AI has the ability to engage with students on an individual basis (Hobert & Meyer von Wolf, 2019) or assist in collaborative learning tasks (Chaudhuri et al., 2009; Tegos et al., 2014; Kumar & Rose, 2010; Stahl, 2006; Walker et al., 2011).

Ease of Educational Accessibility

The integration of AI in education offers the potential to overcome geographical limitations by making learning resources accessible online through the Internet and the World Wide Web. Online learning or the utilization of web-based learning platforms allows for the accessibility of materials from any location worldwide. Furthermore, artificial intelligence (AI) is clearly capable of enhancing accessibility to education in remote and neglected regions. Byju's, an Indian ed-tech startup, uses artificial intelligence (AI) to provide high-quality education in rural areas, hence reducing the educational disparity. Additionally, the incorporation of AI attributes, such as linguistic translation tools, enables students to optimize their learning experience depending on their particular capabilities.

Transformation of Pedagogical Practices

The impact of AI is evident in teaching approaches, creating educational settings that are both individualized, inclusive, and accessible. AI-driven solutions such as Intelligent Tutoring Systems facilitate personalized instruction and individual attention, addressing the persistent problem of the student-teacher ratio in classrooms. According to Pal (2023), "Artificial intelligence (AI) ensures that every student experiences a sense of recognition and validation." It is like having an individual mentor for each student. Intelligent Tutoring Systems (ITS) utilized by AI to provide interactive and adaptable learning experiences offer immediate feedback, detect areas of learning deficiency, and provide specific assistance, guaranteeing that students receive personalized coaching in real time (Singh, 2023).

According to Sayed et al. (2021), numerous scholars concur that it is crucial in education. However, it is important to note that this does not guarantee perpetual advantages and a complete absence of threats (Dastin, 2018). Elon Musk and Stephen Hawking expressed concerns that once AI reaches a highly developed state, there is a possibility that it could become uncontrollable by humans (Clark et al., 2018).

It has been observed that individuals who receive assistance from decision support systems powered by AI often exhibit excessive dependence on AI system. They tend to unquestioningly accept the suggestions provided by AI, even in cases where such suggestions are incorrect. (Buçinca et al., 2021). Overreliance typically occurs when consumers are unable to ascertain the extent to which they should place faith in AI. Users struggle to ascertain suitable degrees of confidence due to their limited understanding of the capabilities of AI (Passi, S., & Vorvoreanu, M. (2022). There is a concern among experts that the potential for human intellect is bound to get diminished with the growing use of AI and people become less intelligent and more like machines (Ahmad et al. 2023). As expressed by Professor Hawking there are potential repercussions of developing artificial intelligence that can equal or exceed human capabilities. He said, "Humans, who are limited by slow biological evolution, couldn't compete, and would be superseded" (Köbis and Mehner, 2021).

Issues of Concern in the Field of Education

The AI raises the following issues of concern in the field of education:

- *Over reliance:* Excessive dependence leads consumers to place trust in AI in situations when it is not warranted. Users often experience confusion when there is a significant disparity between their responses and the suggestions provided by AI systems (Kim et al., 2021). The significant

inaccuracies lead consumers to mistakenly believe that they are at fault, when in reality; it is AI's error. The situation gets worse when users handle novel data, such as out-of-distribution data, which refers to data that the AI model has not been exposed to during its training phase. Users anticipate that AI will sustain its performance when presented with novel material, while simultaneously acknowledging that their own performance may deteriorate when confronted with fresh data (Chaing & Yan, 2021). Consequently, users increasingly depend on artificial intelligence (AI) to handle data that falls outside the known distribution. This reliance on AI leads users to trust it more, even when its performance is dubious and unpredictable.

- *Decline in human creativity:* The possible effect of AI on human creativity is a growing concern among academics, artists, and innovators. As the use and reliance on AI grow, it will inherently restrict the cognitive capabilities of the human brain. Consequently, this greatly diminishes people's cognitive abilities. This process eliminates cognitive abilities in humans and renders them more synthetic. Moreover, extensive engagement with technology has compelled humans to adopt algorithmic thinking without comprehending it fully (Sarwat, 2018). Creating new, valuable ideas, solutions, or expressions is a popular definition of creativity. It involves divergent thinking, uncommon opinions, and fusing seemingly unrelated ideas. Humans have always created creativity using their unique experiences, feelings, and mental processes. Increasing AI systems may change the creative process. It may lead to passive consumption of ideas rather than active participation. When individuals outsource creative tasks to AI, they may lose the emotional connection and personal involvement that leads to breakthroughs.
- *Loss of human decision-making:* AI restricts and eliminates the need for humans in decision-making. Decision-making is becoming less dependent on human mental faculties including critical thinking, creative problem-solving, and intuitive analysis (Ghosh et al., 2019). Every day, more and more educational institutions use AI to aid decision-making. Universities are using AI for both administrative and scholarly purposes. AI's key responsibilities in the education sector include personalisation, tutoring, quick responses, 24/7 access to learning, question answering, and task automation. Students can now receive assistance from AI for everything from programme admission requirements to degree issuance (Karandish, 2021). AI renders teachers and other administrative workers useless since it does so much of their work for them. They are losing the ability to perform standard activities in an educational setting, which leads to a loss of reasoning and decision-making skills.

- *Cognitive deterioration and the rise in human laziness:* AI has shown that it can increase productivity and improve results in various applications, from smart home appliances to sophisticated medical diagnostics. This contentious relationship has sparked discussions and brought up significant issues regarding the unforeseen effects of our growing reliance on intelligent technologies. The progressive loss of cognitive capacities, including memory, attention, problem-solving, and linguistic proficiency, is referred to as cognitive decline (Chandler et al., 2023). The ability of the human brain to reason will eventually become limited when AI is used more and more. As a result, humans' ability to reason is gradually diminished (Ahmad et al., 2023). Teachers and students will employ AI software while working on a task or assignment, or their work may be completed automatically. Addiction to AI use can eventually result in laziness and troublesome circumstances down the road.
- *Loss of human touch:* AI is becoming more and more integrated into our lives, and a profound worry the possible loss of the human touch emerges. People run the risk of replacing interactions with AI systems with interactions with other people. Cognitive decline has been connected to social isolation and loneliness. While AI is capable of simulating companionship and communication, it is devoid of the shared experiences and profound emotional comprehension that characterize true human connections. Artificial intelligence is limited in comprehending human emotions and forming meaningful connections. Even while AI has a lot of potential to improve productivity and solve challenging issues, its implementation must take into account the special characteristics that make humans human (Diem, 2023).
- *Gender bias:* Concerns of gender bias in AI systems have been highlighted by the integration of artificial intelligence (AI) across a number of disciplines, especially in the hiring and recruitment process. Favouring male candidates over equally or more competent female candidates is just one example of how gender bias in AI manifests. Another is perpetuating assumptions about gender roles and career choices (Manasi, 2023). There are two key phases where gender bias might arise: creating AI algorithms and training datasets. Both the people who created the algorithms and the data they utilize are frequently the source of biases in AI systems (Neithammer, 2020). AI can internalise gender prejudices in society because they are a reflection of human input. For example, AI systems may link a given gender to particular professions, reflecting antiquated ideas and perpetuating gender stereotypes. The development of gender equality may be hampered by the introduction of human biases into AI systems, which could increase the gender gap.

Conclusion

To summarize, AI plays a crucial role in education by offering individualized learning opportunities and enhancing efficiency. Nevertheless, there are drawbacks to consider, such as the potential for cognitive deterioration, since an overreliance on AI could weaken one's ability to engage in critical thinking. The emergence of human laziness is a potential consequence when pupils excessively rely on automatic solutions. Excessive dependence on AI may result in the absence of human interaction in education, impacting the essential interpersonal relationships necessary for comprehensive growth. It is crucial to achieve a balance where AI supports and enhances human involvement in education, while also retaining cognitive abilities, promoting self-sufficiency, and maintaining the fundamental human aspect.

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