Artificial Intelligence in Education: A Hindrance or an Enabler?

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Abstract

Outside of typical educational settings, Artificial Intelligence (AI) may provide real-time feedback, adjust course content dynamically, and evaluate student involvement through interactive learning strategies. By providing learners with a unique educational experience, artificial intelligence improves instructional techniques. Instructors who employ AI in the classroom, on the other hand, are most afraid of losing their jobs in large numbers. Workers in a variety of industries, education not being spared in this regard, will eventually be replaced by robots and algorithms as machines grow more adept at handling complicated tasks due to the massive levels of automation brought about by the rapidly advancing field of artificial intelligence. A person’s ability to support themselves and maintain the social cohesiveness and a sense of community that come from meaningful work is negatively impacted by losing their job. Therefore, it’s important to strike a balance between the benefits AI can provide and any potential ethical or other problems.

Keywords: Artificial intelligence, computers, education, technology.


Introduction

The simulation of human intelligence into a computer system to enable it to think and behave like a person is known as artificial intelligence (Aleven, et al., 2022). This means that the fundamental notion of artificial intelligence is the ability of devices or programs to accurately mimic the thought processes or behaviours of humans (Roll & Wylie, 2016). In addition to fundamental automated tasks, the primary goal of artificial intelligence in education is to provide learners with flexible, personalized, and engaging learning experiences. The pedagogical applications listed below leverage artificial intelligence to enhance learning for students across the lifespan:

Thinkster Math

Thinkster Math is an app for tutoring that combines individualized instruction with the arithmetic curriculum. The software visualizes students’ thought processes as they solve arithmetic problems using artificial intelligence (AI) and machine learning (ML).
This makes it possible for the teacher to identify the child’s weak areas in reasoning and thinking. After that it helps them by providing them with tailored feedback.

**Brainly**

On this educational portal, students can post homework questions and get automatically validated responses from other students. Brainly employs machine learning (ML) techniques to filter out spam, which eventually speeds up student learning.

**Gradescope**

This platform offers student data that can show where students need extra help and cuts down on grading time (teachers’ grading time is decreased by at least 70 per cent).

**Duolingo**

Duolingo is an American educational technology company that produces learning apps. It offers courses on Music, Math and over 40 languages, ranging from English, French, and Spanish to less commonly studied languages such as Welsh, Irish and Swahili. Other services include the Duolingo English Test, an online certification program, and Duolingo ABC, a literacy app for children. As of February 2023, Duolingo was the world’s most popular language learning app based on monthly downloads, which stood at almost 13.4 million in that month only.

According to Russel and Norvig’s (2010) research, artificial intelligence could assist educators in providing more individualized instruction for their students. Adaptive learning, smart classroom technologies, pedagogical agents, and intelligent tutoring systems, are a few popular applications of artificial intelligence in education. The link between these trends is depicted in the diagram below.

Figure 1. Interrelationship of Modern Trends Related to AI in Education
AI in education has given a completely new perspective of looking at education to teachers, students, parents, and of course, the educational institutions as well. Teachers, students, and of course educational institutions themselves now have a whole new way of viewing education thanks to artificial intelligence in education. Using artificial intelligence (AI) in education means assisting instructors and students and improving the efficiency and quality of the educational system rather than replacing human teachers with humanoid robots. Indeed, debates have already begun regarding whether AI can actually take the role of teachers (Bayne, 2015). According to research on artificial intelligence, it could be dangerous to assign teaching duties to machines (Humble & Mozelius, 2019).

Anybody’s life is enriched by education, and having a successful life is largely dependent on having a decent education. Numerous improvements, ranging from curriculum design to teaching methodology, are always taking place globally to enhance the educational system for students. The world is rapidly changing due to artificial intelligence, a burgeoning technology that is employed in practically every industry. The field of education is one where AI has the potential to significantly alter things and in some cases has already done so. Artificial intelligence (AI) holds the promise of addressing some of the most pressing issues facing education today, innovating in methods of instruction and learning, and accelerating the achievement of Sustainable Development Goal (SDG) No.4. Rapid technological advancements do, however, necessarily carry with them a number of risks and difficulties that have thus far surpassed regulatory structures and policy discussions. In order to achieve the Education 2030 Agenda, UNESCO is dedicated to helping Member States fully utilize AI technology, while making sure that the fundamental values of fairness and inclusivity inform its implementation in educational settings (Floria & Radu, 2019).

AI must by definition take a human-centred approach, according to UNESCO’s mandate. In order to prevent AI from deepening the technological gaps that already exist between and within nations, it seeks to change the conversation to focus on AI’s role in addressing present disparities surrounding access to knowledge, research, and diversity of cultural expressions. “AI for All” must provide universal access to the benefits of the ongoing technological revolution, particularly in terms of innovation and knowledge, and the ability for everyone to benefit from it. Additionally, UNESCO has published a book for education policy-makers that aims to increase their preparedness for artificial intelligence within the context of the Beijing Consensus (Tapalova et al., 2022). Professionals and practitioners in the policy-making and education worlds will find value in this publication “Artificial Intelligence and Education: Guidance for Policy-makers”. The objective is to foster a collective comprehension of the advantages and difficulties that artificial intelligence presents for the field of education, together with its consequences for the fundamental skills required in this new age of AI.

Artificial intelligence holds great potential to revolutionize Africa. It may play a crucial role in helping Africa meet its Sustainable Development Goals (SDGs), one of which is raising educational standards. Sub-Saharan Africa, however, receives the lowest score globally according to the “AI Readiness Index 2020 (Berker, 2021). Just a handful African nations are among the top 100 countries in the world according to the index, which evaluates a government’s preparedness for artificial intelligence (AI) based on three major pillars: governance, data and infrastructure, and technology sector. Mauritius is placed 45th in the world, followed by South Africa at 59th, the Seychelles at
68th, Kenya at 71st, and Rwanda at 87th. The index mainly evaluates the actions governments have made to apply AI.

It is important to remember that, like most other nations, Kenya lacks a stand-alone AI policy or framework, despite the dangers being employment displacement, privacy infringement, and security threats (Mutisya, 2020). In order to address concerns about artificial intelligence and digital technology, it depends on the regulations that are now in place. The Data Protection Act of 2019, for example, establishes a framework for data protection in Kenya. Kenya’s Computer Misuse and Cybercrimes Act of 2018 is one regulation that has an impact on AI activities. It offers a framework for handling offences involving digital platforms. It makes it possible to prohibit, prevent, respond to, investigate, and prosecute computer and cybercrimes in a quick and efficient manner.

According to Kenya’s IT industry, a new measure intended to regulate artificial intelligence in the nation would discourage investment and hamper innovation. In addition to imposing license fees on people employed in the field, the law aims to establish a professional body to supervise the actions of AI practitioners. Guaranteeing government support for AI research and development is another goal. The bill’s detractors content that it would make it more difficult for AI to enter Kenya, which would hinder the industry’s potential to boost the country’s economy and innovation ecosystem. Policymakers in Kenya must support current legislation and carry out effect analyses of recently enacted instruments in order to advance AI policy.

The field of education in Kenya has numerous uses for artificial intelligence. A platform for online learning financed by UNICEF, Angaza Elimu, uses artificial intelligence (AI) to give students customized instruction according to their unique requirements. It allows them to track their progress and provides students with learning notes and assignments tailored to their individual learning experiences. It also makes it possible for instructors to evaluate their learners’ aptitudes and supply them with specialized learning materials. Another application in the education space is M-shule, a platform based on the Short Message Service (SMS) that allows institutions to provide data, learning, and assessment tools.

The pros and downsides of artificial intelligence (AI) in education are complex, offering both opportunities and difficulties. It takes careful preparation, thought, and continual assessment to strike a balance between artificial intelligence’s potential benefits and downsides in education. AI can swiftly and simply empower teachers, speed up learning, and customize educational experiences. However, the dangers of prejudice, false information, and student isolation necessitate further examination. To effectively advocate for their students and themselves, educators need to investigate the possibilities presented by artificial intelligence.

The pros of AI in Education

Customized Instruction

AI is capable of adjusting to each student’s unique learning style and speed. AI-powered learning platforms can change the content, propose resources, or raise or lower the difficulty level in response to student performance. This individualized method makes sure that students stay on track and successfully understand the material. To make it simpler for students who speak a different language to grasp assignments, ChatGPT can for example, translate content into another language.
quickly and efficiently. Furthermore, ChatGPT has the ability to modify content to fit different grade levels and customize assignments based on the interests and abilities of the learners.

**Enhancing Student Performance**

Artificial intelligence real-time input facilitates quick learning and correction. Students can receive immediate feedback on their comprehension of a subject matter rather than waiting for an instructor to mark their work. It enables them to quickly pinpoint and improve their weak areas. Platforms driven by artificial intelligence (AI) are able to assess pupils’ development, give them focused feedback, and pinpoint areas in which they still require work. AI is also able to track students’ behavior patterns, evaluate their attention spans, and identify areas in which students require extra support in terms of certain courses, specialized knowledge, or abilities. Students’ abilities should be elevated to new levels by instantaneous AI-powered feedback and improved learning opportunities.

**Creates a Dynamic and Participatory Learning Environment**

Artificial intelligence has the capability to generate engaging and dynamic learning environments that surpass traditional classroom settings. AI has the ability to generate authentic settings that students may engage with through the combination of Augmented Reality (AR) and Virtual Reality (VR). Students can visit historical locations, explore simulations, and conduct practical experiments thanks to AI-powered AR and VR technologies, which help to clarify and enhance abstract ideas. AI improves students’ comprehension while also making studying more enjoyable and interesting. Ed Tech products with artificial intelligence built in can help teachers by saving time without compromising the quality of work produced. ClassPoint is a fantastic example of a user-friendly AI-powered tool. Its primary objective is to reduce the strain of teachers who create quizzes by instantly and easily constructing compelling questions from any PowerPoint slide.

**Reduced Human Error**

Technology has advanced to the point that numerous tasks that were previously handled by humans are now automated. For example, in the evaluation of tests and homework in the sphere of education, artificial intelligence (AI) has decreased human error. A predetermined set of algorithms and previously acquired data determine every choice made by AI. These mistakes can be minimized to zero when properly coded.

**Global Accessibility**

AI enables distance learning, removing geographical constraints and offering learning prospects to learners globally, promoting inclusion and easy access to high-quality education. Flexibility is one of the main benefits of distance education. Because they can access instructional materials and resources whenever it’s convenient for them, students can fit their study around other obligations. Students can enhance their technical proficiency and gain more proficiency in using digital tools and platforms by participating in remote learning. The logistical obstacles and practical difficulties that come with traditional classroom-based education, like scheduling issues and transportation, are removed with remote learning. Furthermore, by using adaptive algorithms and analytics, remote learning may offer customized learning experiences that are tailored to each student’s unique needs and learning preferences.
Empowering Learners with Special Needs

AI can make concepts easier for people with disabilities to learn and comprehend. With the advent of virtual reality headsets, e-readers, and the internet, children and people who would not be able to attend a regular school can now learn. Certain students may have mobility issues that make it challenging for them to move around the classroom; however, artificial intelligence (AI) has enabled special school teachers to integrate their curriculum into dynamic learning environments where students’ enthusiasm and energy levels suffice instead of physical movement. All children can receive more inclusive and accessible education with the use of AI, as teachers can now offer specialized instruction and support to pupils with specific needs. For students who struggle with writing or have restricted mobility, speech recognition software like Nuance can assist with word transcription.

Cost Reduction and Scalability

Educational establishments can reduce costs by employing AI technology to optimize workflows and boost productivity. Through the application of AI, administrative chores like scheduling, grading, and data analysis can be automated, saving time and money by eliminating the need for manual labour. This makes it possible for educators to concentrate on other crucial facets of education such as creating curricula and giving students individualized teaching. To reach more learners, AI can also assist in scaling educational offerings. E-learning resources can be readily modified and distributed to students across time zones and locales with the help of AI-powered applications. Otherwise, higher learning results and greater educational equity would result from denying some pupils access to high-quality education.

The Cons of AI in Education

Data Privacy Concerns

Data privacy is one of the main issues with AI’s application in education. For AI systems to function properly, enormous amounts of data are needed. If it ends up in the wrong hands, it might expose private student data. Strict laws must be implemented to guarantee the security of student data.

Dependence on Technology

Technology can improve education, but relying on it too much might have negative effects. The learning process could come to an end if there are technical issues or system failures. Furthermore, pupils who engage with AI constantly may not acquire the social skills that come from interacting with others in a typical classroom.

Dehumanizing Education Process

Although AI can imitate human reactions, it is unable to comprehend or respond to students’ emotional requirements. Teachers are essential in inspiring and motivating pupils because they provide a human element that artificial intelligence is unable to match. The nuanced approach that a human teacher may provide to kids may be lost on them when AI algorithms create content and determine how quickly courses should be taught. Furthermore, AI algorithms may fail to deliver a varied inclusive curriculum that is adapted to each student’s requirements since they can reinforce bias. In the context of a comprehensive education, emotional intelligence is just as significant as
academic intelligence. To effectively instruct, artificial intelligence must be used in harmony with the invaluable human touch of teachers.

Conclusion and Recommendations

Although AI in education is still in its infancy, it has already demonstrated a great deal of promise to revolutionize the education process. We should anticipate seeing even more creative applications of AI in education as technology and AI develop. AI can be used to create information that is specifically suited to each learner’s needs and preferences. Kenya’s ministry of education also ought to use AI in classrooms. AI is employed in industrialized nations for student testing and instruction. Teachers may provide pupils with the human touch that machines cannot by being relieved of administrative responsibilities.

Teachers’ workloads can be lightened by AI-driven devices that grade assignments and administer exams. In most of our learning institutions, instructors bring stacks of exam papers and workbooks home each day to be graded. Teachers ought to be having meaningful time with their families, not on such activities. The greatest outcomes for kids and teachers will come from the sharing nature of human and robots. Differentiated learning is a skill that AI excels at providing. With 45 learners in each class on average, teachers still find it difficult to individualize instruction, particularly for those with special needs. Machines can accomplish this with ease.

AI also offers some positive news for parents who find it difficult to help their kids with their homework. Although there are currently few such AI applications, numerous initiatives are being made to bring them to every Kenyan household. It won’t be necessary to send kids to tutoring facilities or make them skip school when they are sick. Very soon, learning will be accessed through a machine. Though there have been other game-changing innovations, AI is expected to be the next big breakthrough. Just as the internet changed things, we anticipate AI to do the same.

This paper proposes the following:

- A framework for AI regulations should be developed by the government that strikes a balance between advancing AI innovation and upholding human rights.
- Science, Technology and Mathematics (STEM) course enrollment should be promoted by the Ministry of Education in partnership with members of the public and private sectors.
- To make AI systems accessible to a large number of people, especially the disconnected, the Kenyan government should invest in broadband connectivity.
- The employment of AI by the government for surveillance and weaponry should be avoided.

References


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