Role of Artificial Intelligence in Education: A study

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Abstract

In the rapidly evolving landscape of education, technological advancements have played a vital role in transforming traditional learning methods. One such innovation that has gained significant attention and adoption is the use of artificial intelligence in eLearning. AI is one of the most important technologies in the world today that is already at work in our everyday lives, influencing everything from online dating to our shopping habits. AI has the potential to revolutionize education by making learning more personalized, adaptive, and accessible to learners of all backgrounds and abilities. This study aims to present a study on artificial intelligence and its role in the education sector along with a discussion of Chatbot. Chatbots, essentially software applications that can engage in human-like conversation, can transform the way educators and students interact, with far-reaching implications for teaching and learning processes. Unlike traditional classrooms, which relied primarily on static content, chatbots are emerging as the technology capable of introducing dynamic, interactive and personalized learning experiences. The onset of the COVID-19 pandemic has served as a catalyst for the further integration of technology into education, necessitating a pivot to remote learning and thereby giving impetus to the application of AI chatbots in educational contexts. AI chatbots can offer several advantages, such as enhanced efficiency and accessibility, potentially improving the quality of teacher-student interactions. This article also addresses various challenges being based during incorporation of artificial intelligence techniques in education field.The rise of AI in education serves to enhance, not diminish, the human element of learning.

Keywords: Artificial Intelligence, Chatbot, Education, eLearning, Teacher-learning process

Introduction

One of the new and emerging technologies Artificial Intelligence (AI) that is capable ofaltering the whole scenario of social interaction. AI now has been an integral part of humanlife and the most importantly has taken its place in all aspects of today's life. The twenty-firstcentury has made Artificial Intelligence (AI) a reality and convinced people of its need. AIhas been developed to the extent that it can be used in all spheres and sectors includingeducation such as defence technical services, business and mass media etc. The integrationand application of AI in the classrooms will make teaching and learning effective by supporting teachers and learners in the process through the

usage of robotic technology and sensors. AI is accessed and delivered mainly through computers, laptops, tablets, iPads, multimedia mobiles and other technological instruments.

Artificial Intelligence (AI) is currently high on the political and research agendas around the world. With the emergence of every new technology, there is always both a lot of hype and scepticism around its implications for society and the economy. Although acknowledging that the foundations for AI have been already around for several decades, recent technological breakthroughs are accelerating what AI could do. This study looks at what this could mean for learning, teaching, and education.

Chatbots are artificial intelligence (AI) based programs that can interact with humans. These intelligent systems can process incoming messages, interpret users' intentions and generate relevant responses. Chatbots are used across a wide range of platforms and applications, such as websites, mobile apps and social media platforms. These systems typically use native language processing algorithms and machine learning techniques to understand incoming text communication and generate meaningful and relevant responses.

Chatbots have many uses, such as customer service, virtual assistants and, last but not least, education. The launch of ChatGPT at the end of 2022 almost turned the world upside down and by now everyone has heard of this AI.

Artificial Intelligence

The term Artificial Intelligence (AI) was first coined by John McCarthy in 1956, two years after the death of Alan Turing, known as the father of AI. He was thinking about how a machine can think and developed a machine, called the Turing machine that demonstrates intelligence like human beings such as learning, logical reasoning and problem-solving etc.

Artificial Intelligence has many different definitions. In the headlines of newspaperarticles, AI is a machine that thinks, understands languages, solves problems, diagnosesmedical conditions, keeps cars on the highways, plays chess, and paints impressionisticimitations of van Gogh paintings. AI is often defined as a computer system with theability to perform tasks commonly associated with intelligent beings.

Need and Significance of AI

AI predicts new scenarios based on a large number of historical dataand this is a sector of unutilized potential. The advancement of fastercomputer processes, the availability of large amounts of big data and progress incomputational approaches established the base for the renaissance of AI that now has been anintegral and inseparable part of human life. Anomalously the more it gets integrated into life,the fewer people think of it as Artificial Intelligence.Artificial Intelligence (AI) is often known as advanced computer programmes such as Autoblocking cellular numbers email spam filtering and voice-activated smart speakers asAmazon Eco, Google Assistant and AirPlay etc. Another area of AI development isautonomous vehicles without human intervention with the usage of neural networks.

Artificial Intelligence (AI) in Education

Like other technological innovations, artificial intelligence also plays a key role in the field of education through improving teaching and learning and big data is working a fuel. Thegovernments and education institutions are thinking to prepare learners to thrive in anartificial intelligence saturated future and for the increasing presence of it in all aspects ofhuman activity. Researches in the field of artificial intelligence mainly focus on componentsof intelligence such as learning, problem-solving, reasoning, decision making and usinglanguage etc.*

- **Personalized Learning and Universal Access to Education**

Artificial intelligence (AI) technology facilitates inclusive and equitable quality educationalong with ensuring universal access to life-long learning for all across the world. It providesdisadvantaged society and communities and marginalized people such as people withdisabilities, refugees, out of schools, those who live in remote areas and migrant laborers etc.access to specific education according to their needs. Robotic technology enables one toattend classes from everywhere in the entire world and continue learning even in emergenciesand crises. AI provides step-by-step individualized tutorials for each student and provides anoptional pathway after analysis of learning materials and activities as well as strengths andweaknesses of students. AI traces the knowledge of learners, automatically adjusts the levelof difficulty and provides guidance to the learners according to their needs and requirements.

- **Teaching and Learning**

A study was conducted by research organization Tracxn and it was observed that about onetenth(11%) of Indians who use artificial intelligence (AI) based technology in theirorganizations belong to teaching and learning. There are several AI technology-basedapplications used for teaching and learning at present. Technology hasmade limitless knowledge and information easily accessible to each individual across theworld as unlimited information and contents, as well as learning materials, are available ondigital platforms. AI-based technology helps individuals to reach the destination, access therequired materials and gain the exact data. Digitally availability of such a large number ofdata and materials creates difficulty to reach the authentic data and materials, createsconfusion in the process of authentication but in this case AI-based technology guides andsupports individuals.

AI-based technology has reached into the classroom and greatly affected the teaching andlearning process. The personalized learning system is increasingly growing in learningcentres and educational institutions across the world and it has a far-reaching impact. Thetwenty-first century has already expected its possibility but COVID-19 has made it realityhappen of a sudden (Holmes Bialik&Fadel, 2019). The technology of artificial intelligencehas been advanced and sophisticated that can recognize the gesture of the students andunderstand their mood and ease during the lecture even it can read facial expressions andposture of the students to understand the difficulty and problems they are facing in the lectureand recommends altering the lesson (Kengam, 2020). AI helps teachers in teaching

byproviding appropriate teachings aids and digital platforms and reduces workloads throughautomatic assessment, plagiarism detection and feedback etc. (Holmes, Hui, Miao, &Ronghuai, 2021). AI never can replace human teachers but it helps teachers in effectiveclassroom teaching and assessment of assignments grading tests and providing twenty-fourhours of academic support to their students because teachers cannot be available all the time.

- **Assessment and Evaluation**

Lack of education and a poor education system is the root of many human problems acrossthe world. An assessment provides a base and defines education that people acquire (Holmes,Bialik, &Fadel, 2019). The process of assessment and evaluation rather than the wholesystem of examination has been a centre of discussion for continuation reform for a long.

Artificial intelligence (AI) technology-based assessment system can be used to assessstudents' knowledge, understanding, skills such as collaboration and persistence andcharacteristics such as confidence and motivation etc. AI assessment system collectsinformation and processes it to evaluate the progress of each student that takes place over aperiod of time. AI assessment system needs information about the curriculum, subject andlearning activities and the details of the steps taken by students (Luckin 2017).

AI-based assessment and examination require only a one-time investment in the beginningbut it significantly saves time, money, and energy as well as it is highly objective and awayfrom expected human errors. Quickly online examinations can be conducted and immediateresults also can be published in a single moment through this technology. AI technology-based cameras and other instruments are also used for remote invigilation purpose that hasbeen common in various countries and works accurately. Assessment is an important factorthat plays a significant role and provides a quality base to the education system and bringspositive changes in the education system (Cope, Kalantzis, &Searsmith, 2020). AItechnology-based assessment provides continuous feedback to stakeholders such as teachers,students, parents, administrators and policymakers as well community leaders about how thestudents learn and making progress towards learning and need support (Luckin, 2017).

Artificial intelligence technology is already grading tests based on objective questions such asmultiple-choice questions (MCQs) but working to successfully grade tests based onsubjective questions such as paragraphs, essays and statements.

- **Helping Physically Challenged Learners**

More than seven billion and around 15% of the world population is physically challenged inany form. Very few of them have access to assistive technologies and education (Tambekar,2019). Artificial intelligence (AI) supports all types of physically challenged learnersincluding the Hearing impaired, visually challenged, or persons with low vision andlocomotors disability. AI-based applications read

texts in multiple languages for visuallychallenged or persons with low vision and enlarge pictures and explain them for betterunderstanding. This technology helps hearing-impaired learners to read through signlanguage and converts texts into sign language to understand. Learners with locomotorsdisabilities get universal and remote access to the classroom all the time from anywhere toeverywhere in the world beyond their geographical conditions and disabilities through AIbasedtechnology. This technology and AI-based applications are more helpful to suchvulnerable learners having various types of disabilities and physical challenges to acquirequality education and progress with common individuals of the society without dependencyon other individuals for education and development (Kengam, 2020).

Chatbots

Chatbots are artificial intelligence-based systems that can communicate and respond to users questions or instructions. People can communicate with chatbots through websites, apps, social media platforms or even voice interfaces.

From an educational point of view, chatbots can answer students' questions, provide them with help and general information immediately following the condition of the question. This is very different from a Q&A forum, where it can take hours for the person asking the question to get an answer. Virtual assistants can be used as virtual teachers in the field of education. They can engage in conversation and interaction with the user, similar to a real teaching environment, with the advantage of being able to access content available on the network to generate answers and solve questions on various topics related to the subject.A survey of higher education in India showed that as early as 2020, nearly half of students use chatbots to communicate with their educational institution, and identified Chatbot as the fastest communication tool.

Many leading mobile phone manufacturers have their own voice-activated virtual assistants, which users prefer to configure to perform certain functions more conveniently. Here are some of the more relevant examples:

- **Siri:** a virtual assistant developed by Apple that runs on the iOS operating system. Siri helps users search for information, send messages, manage calendars, view weather reports and perform other tasks for users.
- **Alexa:** is a chatbot for Amazon Echo smart speakers that can interpret and respond to voice commands. Alexa helps with home automation, music playback, information search and more.
- **Google Assistant:** a virtual assistant developed by Google that can respond to users' questions and instructions. Google Assistant helps with search, calendar management, navigation, translation and other activities.

- **Xiaoice:** a popular Chinese chatbot developed by Microsoft. Xiaoice is an emotionally intelligent chatbot that can interpret and respond to human emotions and is able to engage in longer conversations with users

The release of ChatGPT has taken our understanding of chatbots and artificial intelligence to a whole new level. ChatGPT is an AI-based language model developed by OpenAI. GPT stands for Generative Pre-trained Transformer, which is a deep learning model. The chatbot ensures multilingual communication. Through data analysis and modelling, it can understand questions, generate instructions and answers, and learn from incorrect answers. It is clear that ChatGPT has huge potential for education. However, it is important to exploit it within a reasonable framework.

Legal Issues in AI

The entire world is concerned about human rights and legal issues of Artificial intelligence(AI) arising day by day. It includes paucity of algorithmic lucidity and transparency, cybersecurityamenabilities, shabbiness, biases and discriminations, legitimate personhood issues,lack of possibility for the challenge, intellectual property rights issues, inauspicious effect onworkers, issues of data protection and fundamental rights of privacy, the possibility of harmof person and vandalism of property, lack of accountability for caused destructions and so on.

With the advancement of AI technologies the legal issues, Vulnerabilities and their impact onhuman rights need further research and monitoring. With regard to these issues, variouspolicies were framed such as United Nations Activities on AI by UNO and Preliminary Studyon the Ethics of Artificial Intelligence by UNESCO etc. (Rodrigues 2020).

Conclusion

Artificial Intelligence (AI) is gradually changing the landscape of the education system across the world. It made universal access to the classroom possible all the time for all individualsall over the world. AI applications are widely being used today by learners and teachers. AIfacilitates personalized learning and provides universal access to all levels and types ofquality education beyond all limitations as well as it promotes distance, open, online anddigital education. In near future, through the help of AI, the education system will befacilitating a life-long education process in a true sense for all individuals across the world.

The future of education is therefore moving in a direction where technology and human interaction complement each other to enhance learning and student development. As AI and chatbots create new opportunities for personalized learning, interactive learning and improving the efficiency of the educational process, teachers should strive not to displace but to implement these technologies appropriately.

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