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Research Article

Artificial Intelligence in Higher Education: Impact and Future

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Abstract

The digital computer as Artificial Intelligence (AI) began to seem a plausible prospect in the years before the Second World War. Used in science fiction, the term Artificial Intelligence (AI) has become somewhat popular as it penetrates ever more spheres of our daily existence. The debate of artificial intelligence in the broad sense of intelligence evolved through computers, had also acquired confidence by the early 1950s. It starts as a notion in 1956 and takes several hints before it at last materializes. During the Dartmouth workshop in 1956, American computer scientist John McCarthy employed artificial intelligence for the first time. Thanks to 21st-century artificial intelligence technology, the delivery of top-notch education at all levels has evolved. Teachers have lately applied several innovative technologies to improve their instruction of different students. This paper investigates the past, present, and future of artificial intelligence in the context of the teaching and learning process, thereby offering efficient access to education for all. The purpose of this study is to predict how AI will affect education and how people will learn in the future. It examines how AI may have an educational impact on how students learn and how institutions instruct all diverse learners. To improve the learning environment in recent years, higher education has progressively been implementing modern technology and approaches. Although technology has advanced many aspects of education, there are questions over how it can influence higher education. In the context of higher education, AI offers numerous possibilities and new chances in the realm of varied learning methodologies. AI has been used and applied in many areas, including language translation, speech recognition, game simulation, etc. AI has a substantial impact on teaching, learning, and education. Humanoid robots cannot replace human teachers in our educational system, and AI never discusses them as potential teachers. We can assist educators and students in improving the effectiveness and efficiency of the teaching and learning process with the help of AI. In the upcoming years, it will be crucial to make sure that AI is employed in a way that enhances rather than replaces human instructors. As this kind of technology develops and is included in the present educational system, researchers and developers should aim to solve any concerns and challenges that may arise. Potentials of artificial intelligence in education need more investigation.

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1. INTRODUCTION

Education is an important sector in every country and has an impact on every sector, like business, economy, society, etc. In India, teachers teach all the students face-to-face mode. But after COVID-19, the education system has been disrupted. Due to COVID-19, there have been various changes in every sector, including education. Face-to-face learning becomes online learning. Online learning was new to teachers, and they deliberately started to become familiar with both teachers and learners. But students find difficulty following these online platforms. So artificial intelligence played an important role during this time. Artificial intelligence plays an important role in higher education. AI was mentioned in 1943 by Walter Pitts and Warren McCulloch, who presented a model of artificial intelligence neurons. First of all, the beginning of artificial intelligence for companies and entertainment, Alan Turing released Computing Machinery and Intelligence. Alan Turing: Computer machines might either think like humans or not, based on tests. This was the first significant artificial intelligence philosophical proposition. In 1950, Alan Turing penned "I propose to consider the question, 'Can machines think?" Russell and Norvig concur with Turing that artificial intelligence has to be described as "acting" rather than "thinking." Developed to enable tutoring in mathematics and sciences, and AutoTutor (Graesser *et al.,* 2004), cognitive tutors (Anderson, Corbett, Koedinger, & Pelletier, 1995) support learning of physics, computer literacy, and critical thinking in a dialogue-based manner. Along with assessing the created idea maps during the process of concept mapping, an intelligent concept mapping tool could guide or offer tips to the students (Hwang, Wu, & Ke, 2011). Designed during the years preceding and including the Second World War, the digital computer became a real prospect for artificial intelligence. In the broad sense of intelligence developed via computers, artificial intelligence (AI) has also been under discussion with growing confidence early in the early 1950s.

Background of the study

Artificial intelligence (AI) is reinventing higher education using changes in teaching, learning, research, and administrative processes. Its integration has allowed customized learning experiences and automated evaluations as well as more data-driven decision-making. Institutions are more and more embracing artificial intelligence solutions to boost student involvement, improve academic performance, and streamline operations. As artificial intelligence technologies advance, they provide both new possibilities and challenges for teachers as well as for students. Preparation of institutions to be accountable depends on an awareness of the present effect and future tendencies. The paper looks at how artificial intelligence is transforming higher education as well as its opportunities to rethink academic environments moving forward.

2. OBJECTIVES

To analyze the impact of artificial intelligence on teaching and learning in higher education institutions. To explore future trends and potential applications of artificial intelligence to enhance the quality and accessibility of higher education.

3. METHODOLOGY

This study adopts a theoretical research methodology, based on an extensive review of existing literature, critical analysis of scholarly articles, and synthesis of current research findings related to the impact and future of artificial intelligence in higher education.

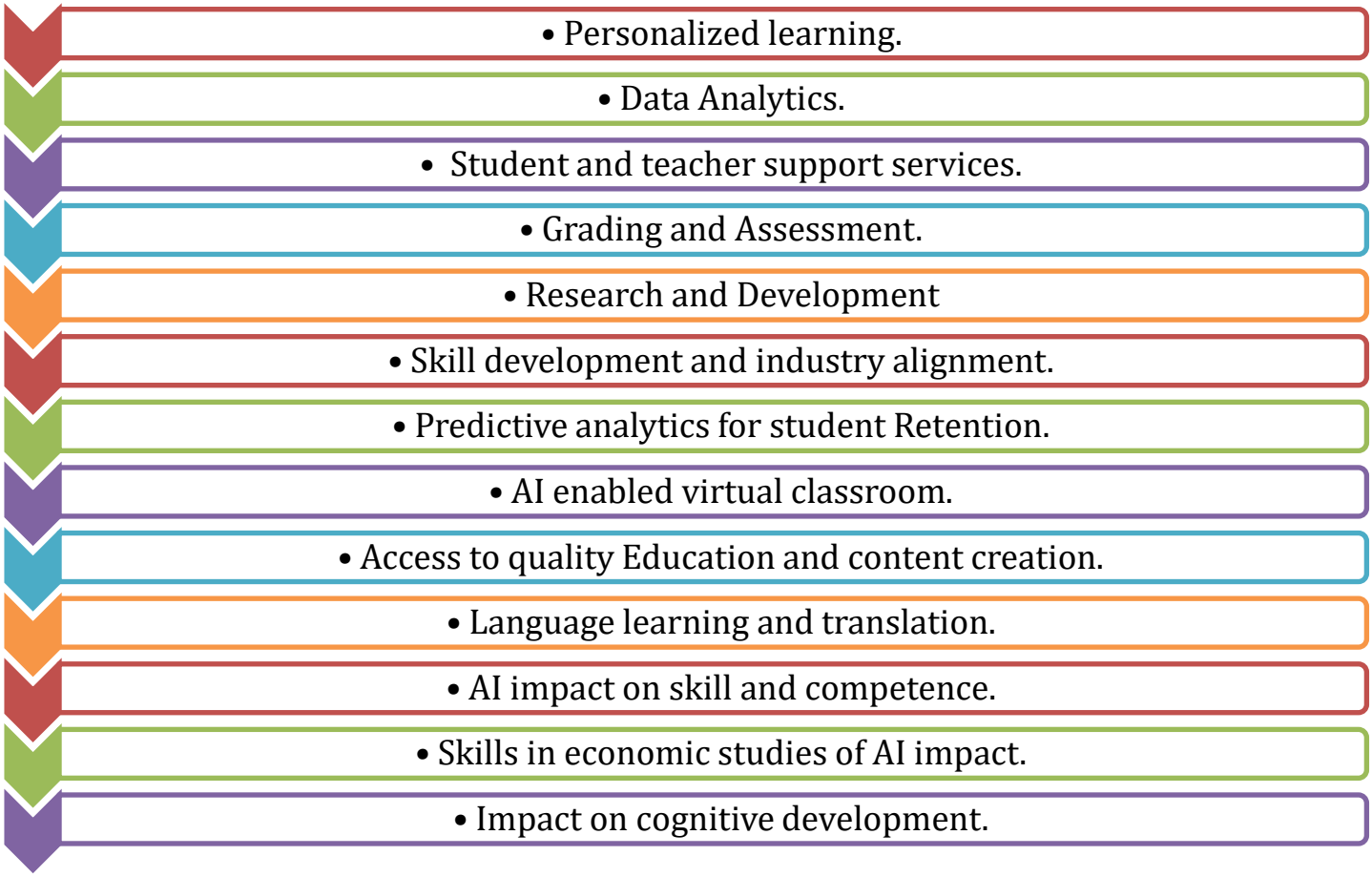
Origin of Artificial Intelligence

Logic theorists Allen Newell and Herbert A. Simon developed the first artificial intelligence program under the name Logic Analyst in 1955. As we will see, bringing it into reality as a notion took many hints, fits, and starts until it ultimately materialized as such in 1956. American computer scientist John McCarthy originally embraced artificial intelligence at the Dartmouth conference in 1956. John McCarthy, a creator of artificial intelligence, concurred, noting that "artificial intelligence is not, by definition, a simulation of human intelligence." For McCarthy, intelligence is "the computational part of the ability to achieve goals in the world." Teachers have embraced some creative tools lately to accommodate different students. This study is to look at the source and influence of artificial intelligence in several spheres of education to guarantee everyone has access to knowledge. The American Association of AI convened its first international conference in 1980. Among the technologies first meant to help persons with disabilities are assistive ones, including text-to-speech--speech, speech-to-text, zoom capability, predictive text, spell checkers, and search engines. Artificial Intelligence is improving things right now. In both my classroom and another area of institutional management, tools and equipment are used daily. Google unveiled the Android app "Google Now". This software could give the user a prediction with details. With artificial intelligence helping to create a learning environment, combining virtual and real-world AI has been used and applied in many fields, including speech recognition, language translation, game simulation, autonomous vehicle design, and medical diagnosis. Learners can conduct more customized, immersive, and engaging learning in a virtual fusion environment. Artificial intelligence affects education, learning, and instruction such that they become meaningful. Like society and the direction of education and learning, artificial intelligence affects all elements of life. People behave depending on their beliefs about what will happen next. Bloom, sometimes known as the Bloom 2-sigma problem, conducted educational psychological problem research. Two possibilities had this taken from them. The first is a personal tutor guiding the pupil; the second is a class teacher covering the whole class. The particular tutor student developed more following the comparison than the classroom student. Computer intelligence helps us to assist teachers and students, thereby improving the efficiency and quality of instruction and learning. Artificial intelligence seeks to be a link between teachers, students, computer scientists, and practitioners, thereby advancing the state-of-the-art in this developing field. In the present situation, especially supporting

the creation of creative new ideas and the inclusive and honest use of artificial intelligence in education, facilitation of the interaction and cooperation among academics from many fields is highly vital.

Impact of Artificial Intelligence on Higher Education

Artificial Intelligence (AI) is already making significant impacts in various industries, including higher education. Its role in the future of higher education is expected to continue growing and evolving. Artificial Intelligence provides learning facilities to all diverse learners in higher education. There are many AI applications used in higher education, like intelligent tutor systems, smart learning, online learning environments, etc. AI provides many solutions in the area of education. Mainly, difficulties come in the academic and administrative systems. With the help of AI, we can resolve all issues related to content accessibility and teacher deficiencies in higher education. AI technology is essential to predicting judgment, computer personalisation guidance, and support (Ma, AAdesope, Nesbit, & Liu, 2014; Steenbergen-Hu & Cooper, 2014; VanLehn, 2011). It provides feedback to students, teachers, and policymakers, which helps with decision-making (Duan, Edwards, and Topal 2019). Now, universities and institutes design many apps, with the help of which they can assess the abilities of students and provide platforms according to their needs. Squirrel AI Learning Company designs apps, applications, and software for universities. It helps in education for getting a higher education. This company uses knowledge-based theory. According to this theory, assess the knowledge level and knowledge caps of students. (Based on the strengths and weaknesses of the student, prepare the study module.) The pertinent term "adaptive learning system" lately attracted a lot of interest since it underlined the goal of enabling individual students' learning using several possible aspects of learning systems, such user interfaces, learning materials, or learning paths, depending on each learner's situation (Essa, 2016; Xie *et al.,* 2017). More lately, knowledge graphs—a popular subject in current AI—can build associations among the several things from the vast volume of connected data based on AI models (Wang, Mao, Wang, &Guo, 2017). Here are some potential areas where AI could play a crucial role in the higher education sector: These are some key areas of impact:



However, it's essential to recognize that while AI holds immense potential in higher education, it also comes with challenges and ethical considerations. Institutions must address concerns about data privacy, algorithmic bias, and the impact of automation on the workforce. Striking a balance between human involvement and AI integration will be crucial to harnessing the full potential of artificial intelligence in higher education effectively.

Future Developments in Higher Education with the Help of Artificial Intelligence

Artificial intelligence (AI) was already showing its potential to transform education in India. Since then, there might have been further developments. It's essential to acknowledge that the integration of AI into the education system also raises concerns about data privacy, ethical use of AI, and potential job displacement for educators. These issues need to be addressed to ensure that AI's impact on education is positive and equitable for all students. AI chatbots, Eliza, Alexa, and Siri, can provide 24/7 support to students, answering their questions, providing guidance on academic matters, and directing them to appropriate resources. These are some Key points:

1. **Expanded AI Integration:** As AI technology evolves and becomes more accessible, its integration into various aspects of higher education is likely to expand further, leading to more sophisticated AI-driven applications.
2. **AI-Enhanced Learning Environments:** Virtual reality (VR) and augmented reality (AR) technologies, when combined with AI, could revolutionise learning experiences. Students might have access to immersive educational environments, making learning more engaging and interactive.
3. **AI-Powered Curriculum Design:** AI algorithms could contribute to designing and updating curriculum based on emerging trends, industry demands, and individual student learning needs.
4. **Ethical AI in Education:** There will be an increased focus on ensuring AI applications in education adhere to ethical guidelines, data privacy regulations, and fairness standards to prevent bias and discrimination.
5. **AI in Institutional Management:** AI could be used to streamline administrative tasks, optimise resource allocation, and enhance decision-making processes in educational
6. **Lifelong learning and development of skills:** AI-driven platforms may play a pivotal role in providing personalised learning pathways for professionals seeking continuous education and up skilling opportunities. Although artificial intelligence has immense power to revolutionize Indian higher education, infrastructure, teacher development, data security, and ethical issues must all be addressed. Institutions, legislators, and stakeholders will be especially important as the technology develops in working together to build an environment fit for the responsible integration of artificial intelligence into higher education. AI is learning using a fresh way. An intelligent tutoring system was the first uses of artificial intelligence in the classroom. That was included into the CAI system. Policies that merely let researchers create software emphasizing new approaches of instruction and new learning outcomes also carry great risk. Generally speaking, artificial intelligence (AI) forces the implementation challenge in the educational sector to create new curricula, assessment techniques, teaching methodologies, and interesting and dynamic learning environments. AI applications in education are distinguished by their aim to clearly express some of the reasoning abilities and knowledge of expert practitioners and use that expertise for teaching and learning. In business, data technologies are clearly helping to automate mundane tasks, hence increasing production (Zubatt, 1988).

How (Artificial Intelligence) systems will change the future of education?

- Artificial intelligence (AI) systems change people's information search and discovery process as well as their usage of it. This clever artificial intelligence (AI) system has drastically changed how we connect with knowledge over the past few years, so impacting both our personal and professional lives. Thanks to more recent, more integrated technology, future students could have rather different experiences looking for and discovering facts than present students.

  Artificial intelligence makes it possible to automate basic teaching activities, including grading and classification.
- AI systems can modify teaching materials to fit the demands of the pupils. Usually, that is generated with modern, very technologically advanced tools and systems. Artificial intelligence makes use of our instructional materials.
- Thanks to artificial intelligence, students can get further help. Artificial intelligence helps the guiding ideas of educational institutions to better serve their pupils. Programs based on artificial intelligence technologies enable teachers and students to share experiences with one another and offer helpful comments for others to benefit.
- Although artificial intelligence fills in gaps and helps to improve educational courses, AI systems highlight areas in study courses that demand. Since students get instantaneous feedback instead of having to wait for the teacher to listen, it guarantees that every student develops the same conceptual underpinnings and helps them grasp the idea and reminds them of how to use it in the future.
- By means of trial-and-error approaches, artificial intelligence systems help to lower the anxiety related to learning. Particularly when AI teachers can propose solutions for development, AI systems can give pupils a means to learn in a rather free environment especially in relation to rules.
- Since technology fast alter, future artificial intelligence systems can redefine the teachers' roles in the classroom. With the development of technology, especially with the introduction of smart gadgets and smart classroom in educational systems, that was somewhat expected.

- AI systems will affect the learning environment, the teacher, and the method of acquiring fundamental skills of the pupils. Whether at home, school, or another venue like Starbucks and the like, AI systems enable teachers and students to grasp the opportunity to choose suitable locations for studying and improve their educational abilities (McArthur, Lewis, & Bishary, 2005).

4. CONCLUSION

Although there are many ways in which technology has benefited education, there are concerns over the potential impact that it may have on higher education. In the context of higher education, artificial intelligence presents a plethora of opportunities and fresh possibilities in the field of a wide range of instructional approaches. Artificial intelligence has been utilized and implemented in a wide variety of domains, including language translation, speech recognition, game simulation, and many others. It has also had a significant impact on the domains of education, learning, and teaching. In our current educational system, humanoid robots are not capable of taking the position of human teachers, and artificial intelligence never considers them as possible teachers. With the assistance of artificial intelligence, we can provide teachers and students with assistance in enhancing the efficacy and efficiency of the process of teaching and learning. In the years to come, it will be of the utmost importance to ensure that artificial intelligence is utilized in a manner that complements rather than the replacement of human educators. The application of artificial intelligence (AI) in the field of education needs to be investigated further, and researchers and developers need to make every effort to solve any potential concerns and problems that may crop up as this kind of technology continues to evolve and become incorporated into the existing educational system.

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