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Role of artificial intelligence in education: An overview

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Abstract
This paper explains the potential applications of artificial intelligence in the field of education. The 21st International Conference on Artificial Intelligence in Education (AIED), which took place in 2020, stated that one of the newest areas of educational technology is AIED. It is still unclear to educators how to employ AI more broadly for pedagogical purposes and how it can affect teaching and learning in higher education. Here are the effects of AI on education along with some of its drawbacks. Additionally, it outlines a particular approach to creating an AI-enabled educational platform, and lastly, it discusses the consequences of AI in education. Artificial intelligence (AI) is becoming more and more important in all spheres of the business, including higher education. The idea of "Artificial Intelligence in Education (AIED)" has advanced significantly in the previous several years. This study looked at the effects of employing artificial intelligence (AI) in higher education as well as how the idea can be used to teaching and learning in this setting. It looks at how often changing technologies affect teaching and learning, including how much and how how they are used. AI makes it possible for services related to higher education to become incredibly accessible very quickly, both within and outside of the classroom.

Keywords: Artificial intelligence, higher education, AI in education, emerging technology, NEP 2020

Introduction

Artificial intelligence (AI) refers to the attempts made to create computerised systems that can mimic human thought and behaviour. The general public defines AI as the capacity of robots or computers to think and behave like humans (Wartman & Combs, 2018). Accordingly, the fundamental concept of artificial intelligence is the ability of tools or programmes to accurately mimic the thought processes and behaviours of humans (Mohammed & Watson, 2019). Timms (2016) suggests that the idea that artificial intelligence will be incorporated into the home computer format may be a product of the current system. It may enter our life in a variety of ways and forms.

Artificial intelligence (AI) is pervasive in today's world and is developing quickly. AI's origins are frequently traced back to the 1956 computer science summer research at Dartmouth College. AI is being used in police cancer investigations, lowering the risk of aviation crashes, creating driverless cars, and other areas. AI-enabled robots have proven to be more effective than human surgeons at suturing wounds; conducting rescue and search operations, caring for children, the elderly, and hospital patients, and helping credit card companies identify fraudulent activity. In the last 20 years, AI technology has been used in education. All of the main AI areas are covered by the Intelligent Tutoring Systems (ITS), including data illustration, machine learning, language, planning, reasoning, and explanation.

New technologies are increasingly being used in classrooms as the environment of education changes constantly. Artificial Intelligence is one such technology (AI). The whole educational system is made more convenient and individualised by the use of AI in education. The way we teach and learn is evolving as a result of the pervasive use of technology in education. Artificial Intelligence is a very inventive approach to tailoring the experiences of diverse learning groups, educators, and mentors.

National Education Policy 2020 states that artificial intelligence ought to be incorporated and taught in classes. Artificial Intelligence is being integrated into curricula to increase productivity, customise instruction, and simplify administrative procedures, giving teachers more time and flexibility to impart knowledge. According to NEP2020, technology— including AI—will radically change how kids learn in classrooms. But a lot of scholarly and technological research is needed for this.

Objectives of the study

The objectives of this paper are as follows:

1. Investigate the Use of AI in Education.
2. To investigate AI from the standpoint of NEP 2020.
3. To learn about the various difficulties posed by AI in education

Review of literature

In any type of research, a review of related literature is crucial. The researchers have also reviewed some literature in our current study. These are listed in the following order:

An empirical investigation on the use of artificial intelligence in higher education was conducted in 2019 [12] by Jain, S. and Jain, R. The study's findings show that incorporating AI into higher education institutions greatly improves students' ability to learn and that the field of higher education would likely see great success with AI.

In 2020, Chen, L. *et al*. conducted research on artificial intelligence in education. The purpose of this study is to analyse the nature and technological aspects of artificial intelligence in education. The impact of AI on education and its function in it were also covered in the study.

In a research titled "Artificial Intelligence in Education," J. Kengam (2020) [13] examined the advantages and disadvantages of AI as well as its effects on education. The study has covered the implications of AI in education in addition to outlining a particular process for developing AI-enabled learning platforms.

In the paper "Artificial Intelligence (AI) & Education Developing Adaptable Learning Opportunities among

Teachers & Learners," written by Khan, M.A. (2021), the researcher covered the definition of AI, its application in education, its problems, and its role. The study also demonstrated how AI is affecting Indian education.
The study "Artificial Intelligence (AI) in Education: Need of the Hour" was conducted by Khan, M.A. in 2023. The researcher has covered teaching AI and the many goals of AIintegrated learning in this work.

Research Methodology
This research is qualitative. In order to create this study work, the researchers read a number of literatures on artificial intelligence (AI). We have acquired this data from secondary sources. References to research papers, websites, articles, and published materials about artificial intelligence in education are made throughout the investigation. In addition, information obtained from journals and print media is considered.

Roles of Artificial Intelligence in Education
"What makes us human is our intelligence, and artificial intelligence is just an extension of that."— Yann LeCun, New York University professor. One branch of computer science called artificial intelligence is concerned with building intelligent machines that behave and think like people. Examples of such robots include those that can identify speech, use judgement to solve issues, and pick up new abilities. The "father of artificial intelligence" is John McCarthy (2006), a computer scientist at the California Institute of Technology. The idea of creating sentient machines initially surfaced in ancient Greece, which is also where the history of artificial intelligence can be discovered. Nonetheless, research on modern AI began in 1950. AI was established as a field of study in 1955. However, the addition of deep learning and machine learning has resulted in considerable advancements in this discipline as of late. Applications of AI in education can be made better in a variety of ways. The National Education Policy of 2020 (NEP 2020) promoted the integration of AI into the educational system because of its great potential.

Artificial Intelligence: Artificial intelligence (AI) is the ability of a machine to perform cognitive functions like perception, learning, reasoning, and problem-solving that are performed by humans. Artificial intelligence (AI) is primarily concerned with mimicking human decision-making processes and doing intellectual tasks in a way that is similar to that of humans, such as learning, problem-solving, speech and picture recognition, and language comprehension. "The ability of a machine to imitate intelligent human behaviour" is the definition of artificial intelligence. Learning, reasoning, execution, and perception are among the goals of AI. Artificial Intelligence (AI) makes digital and automated systems smarter. It also raises the level of technology's dependability.

Different Types of AI: There are different types of AI which are discussed below:

- **Reactive machines:** Reactive machines carry out fundamental tasks. This is the basic level of AI. These AI systems can only respond to their surroundings; they cannot recall past events.
- **Limited memory:** The term "limited memory types" describes an A.I.'s capacity to retain earlier information and/or predictions to use it to update its forecasts. Although it can create memories, these are only utilized for directing decisions at the time.
- **Theory of mind:** In this sort of AI, artificial intelligence starts to communicate with human thoughts and feelings. These systems can comprehend other entities' mental states and react accordingly.
- **Self-aware:** This type of artificial intelligence only exists in stories, and like many stories, they inspire audiences with both great hope and terrifying fear. Self-awareness and consciousness are present in these systems.

Applications of AI
There are several uses for artificial intelligence in modern culture. Because it can effectively handle complicated problems in a variety of areas, including healthcare, entertainment, banking, education, etc., it is becoming increasingly important in the modern world. AI is speeding up and improving the comfort of our daily lives.
Some industries that use artificial intelligence are listed below:

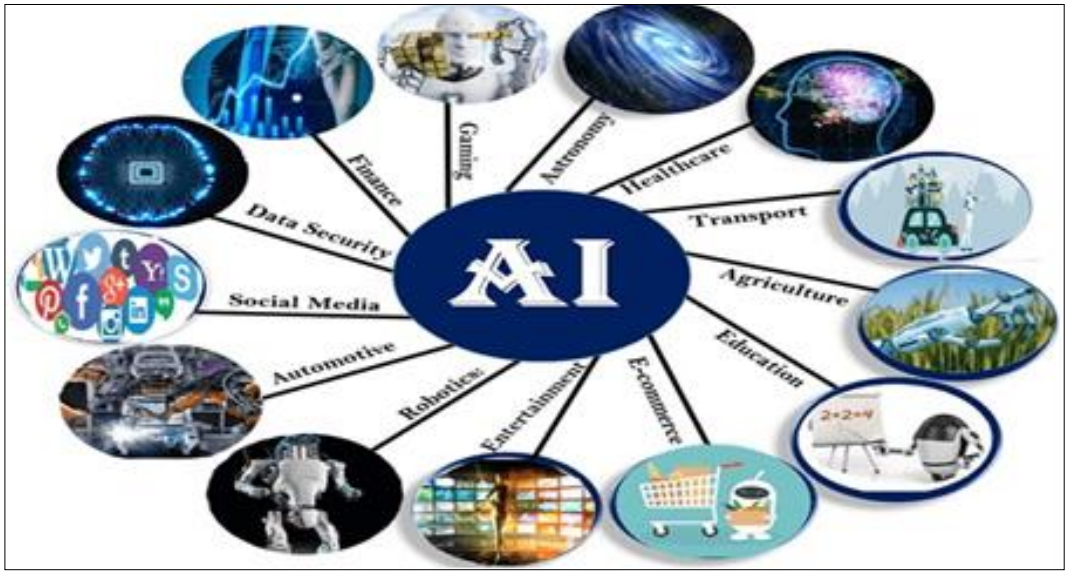

Fig 1

AI Effects on Higher Education

AI's Impact on Higher education will cause employment relocations and substitutions, which means that the skill sets and job markets of the future will differ significantly from those of the present (Siau, 2017, 2018; Rainie and Anderson). Numerous analyses showed that organised, routine jobs are easier to computerise and will soon be replaced by artificial intelligence. As could be assumed, AI will have a harder time replacing work tasks that involve supervising people and are increasingly unstructured. Higher education need to be adaptable and always evolving.

AI will have an impact on higher education from many angles, but two areas of particular concern are admissions and programmes. First and foremost, AI will have a profound impact on advanced education curricula. AI is characterised by its consistency, speed, and accuracy. Trying to compete with AI on these metrics is pointless. However, AI is still weak in areas of sensitive expertise, like as "creativity, innovation, collaboration, empathy, leadership, problem-solving, socialising, and communication." It's not always the case that we should disregard hard talents like "science, math, and engineering." Even today, advanced education should teach pupils the fundamentals of science and maths while providing opportunities and skills in the interim.

Need of artificial intelligence in education

1. Artificial intelligence can be utilized to produce a customized study timetable for every learner, accounting for any gaps in knowledge. Determining what a learner comprehends and does not comprehend is made simpler by AI.
2. AI has the ability to modify the curriculum and content, enhancing its relevance and interest for pupils. By examining vast volumes of data about student preferences, interests, and learning objectives, artificial intelligence (AI) is able to suggest and provide material that engages learners.
3. AI possesses the capability to enhance and broaden students' educational experiences by providing customized learning tailored to individual needs and distinctive accessible techniques.
4. AI refers to the integration of intelligence, calculations, and data analysis techniques with systems to offer students customized and adaptable learning experiences. The goal of AI in education is to improve learning outcomes, promote student engagement, and provide students with the assistance they require.
5. Through the use of multimedia resources, it can enhance instruction and learning by making abstract concepts tangible. It is capable of handling traditional duties, freeing up teachers to focus more on instruction and the unique needs of each student.
6. AI can help teachers create customized lesson plans and assessment strategies that are based on each student's unique strengths and limitations. This helps motivate and inspire students more, which will ultimately lead to improved academic performance.
7. AI facilitates students' access to excellent learning resources, irrespective of their socioeconomic status or place of residence. By analyzing performance data, it can assist teachers in providing pupils with more detailed and precise feedback by pinpointing areas in which they need to improve.

Emerging Technology

An rising technology called artificial intelligence has begun to change educational resources and establishments. The best educational practice in the sphere of education is having teachers present. The employment of teachers, who are vital to the educational system, is changing as a result of artificial intelligence. To track a specific person's pace among others, the AI primarily uses machine learning, deep learning, and sophisticated analytics. As artificial intelligence (AI) solutions advance, they aid in identifying gaps in instruction and learning and raise educational proficiency. AI can improve productivity, personalisation, and administrative work so that teachers have more time and freedom to impart knowledge and flexibility—qualities that are exclusive to humans and which computers would find difficult to replicate. Teachers working in tandem with robots can help pupils achieve their maximum potential.

Nep 2020 and artificial intelligence

All technical components are included in the National Education Policy 2020, with a focus on artificial intelligence (AI). The policy calls for the creation of artificial intelligence-based educational software that will be made accessible in all regional or local languages. All kids, including those with special needs or those who attend school in exceedingly remote places, will benefit from having widespread access to this software or programmes.

The NEP 2020 emphasises the need for individualised learning by acknowledging that children have a variety of learning styles, interests, and aptitudes. AI is enabling individualised learning by analysing data about individual students' learning styles, interests, and aptitudes.

According to the NEP 2020, artificial intelligence (AI) will also aid in the creation of smart classrooms, which will enable online interactions and collaborations with students from different schools throughout the world, as well as online tests, applications with quizzes, and knowledge that can help students grow.

The NEP 2020 recognises the importance of skill development and experiential learning in preparing students for jobs in the twenty-first century. Students can take advantage of AIpowered learning platforms and remote learning tools to access courses that prioritise skill development.

In addition to this, a digital platform called National Teachers' Portal serves as a repository for content produced by all state boards, including CBSE, NCERT, ICSE, ISC, and others. Teachers can use these materials to further their professional development.

Challenges of ai in education

Need for technical expertise: Teachers who are not familiar with AI may find it difficult to integrate this technology into their lessons, and they need help getting started.

Cost of AI tools and applications: The majority of educational establishments don't have the money to buy and keep up the tools needed to use AI in the classroom.

Ethical concerns associated with incorporating AI into the classroom: The increasing sophistication of AI has sparked concerns about its effects on security, privacy, and the labour market. Instructors need to be aware of these issues and take steps to safeguard their pupils while they explore with the quickly advancing technology.

Ensuring inclusion and equity for AI in education: The least developed countries face the possibility of facing new gaps in technology, economy, and society as artificial intelligence develops. Some significant obstacles, such as the basic technological infrastructure, must be addressed in order to establish the necessary conditions for implementing innovative strategies that leverage AI to improve learning.

Visions and inaccurate data: Given that AI is created through data, the underlying data may include unconscious or explicit prejudices that could give rise to discrimination against specific racial or genderbased groups. This could jeopardise the principles of equity and equality in education and exacerbate social divides that already exist.

Data protection: Concerns about privacy and data security are also getting more and more attention. It might be necessary to collect and analyse sensitive personal data, such academic standing and behavioural patterns, in order to apply AI in higher education. Institutions using AI must make sure that the data they acquire is used for that reason, is handled carefully, and isn't disclosed to unauthorised parties.

Conclusion

In conclusion, it may be claimed that artificial intelligence (AI) is revolutionising education systems across the globe. Higher education in India is being profoundly impacted by the way AI is changing how teachers teach and how students learn. As the Indian education system advances to guarantee that every student receives a top-notch education, artificial intelligence (AI) and other cutting-edge technologies will become more and more important. UNESCO is dedicated to upholding the core ideals of inclusion and equity while working with Member States to integrate AI technologies in educational settings. The Education 2030 Agenda may be accomplished by Member States with the aid of AI technologies. AI tools in educational settings that uphold the core principles of equity and inclusivity. The Education 2030 Agenda may be accomplished by Member States with the aid of AI technologies. AI is starting to change the way that educators and learners communicate with one another by optimising curricula and offering personalised learning experiences. The fact that adopting this technology will allow educational institutions to save money, time, and resources seems obvious. As a result, it should be warmly welcomed in order for educational establishments and the communities in which they are located to gain from these findings, since they surely contribute to the development of well-rounded individuals in the next generation.

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