ARTIFICIAL INTELLIGENCE IN EDUCATION: AN OVERVIEW

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ABSTRACT:

Artificial Intelligence (AI) is revolutionizing the educational landscape by enhancing learning experiences, personalizing instruction, and streamlining administrative tasks. This article provides a comprehensive overview of the applications, benefits, challenges, and future directions of AI in education. Artificial Intelligence (AI) refers to the ability of technology, particularly computer systems to simulate human intelligence processes. AI is a rapidly developing field of technology that has the potential to significantly transform all social relationships. To develop innovative teaching and learning strategies in the field of education, artificial intelligence is now being made an effort in a variety of educational settings. AI is being applied to examine enormous quantities of data to find trends and insights that might guide the creation of new educational policies and plans. The main aim of this paper is to study the need of AI in the field of education and find out the different challenges therein. An attempt has also been made to explore AI from the perspective of NEP 2020. The study is qualitatively done by reviewing various articles on Artificial Intelligence (AI).

1. INTRODUCTION

The integration of AI in education is transforming traditional pedagogical practices. This overview explores how AI tools are reshaping teaching and learning processes, highlighting key innovations and their implications for educators and students. The landscape of education is continually changing, and new technologies are becoming more and more prevalent in the classroom. One of the technologies is Artificial Intelligence (AI). The application of AI in education makes the entire educational system convenient and individualized. The widespread use of technology in education is changing how we learn and teach. AI is such an innovative method for adapting the experiences of various learning groups, teachers, and instructors.

According to National Education Policy 2020, AI should be introduced to and included in the regular education curriculum. AI is being incorporated into the curriculum to improve efficiency, personalize learning, and stream line administrative processes so that teachers have more time and freedom to impart knowledge and flexibility. NEP2020 asserts that technology, including AI, will fundamentally alter how children learn in schools. However, this requires a significant amount of technological and academic research.

2. REVIEW OF RELATED LITERATURE

A review of related literature is very important in every kind of research. In this present, the researchers have also reviewed some literature. These are as follows:

Jain, S. & Jain, R. (2019) made an empirical study on the role of artificial intelligence in higher education. The results of the study reveal that integrating AI into higher education institutions significantly enhances the capacity of learners for learning and that AI has a bright future in the sector of higher education. **Chen. L. et. al., (2020) made** a study on artificial intelligence in education. In his paper, the researchers have analyzed the nature and technical aspects of AI in education. The study also discussed the role of AI in education as well as its impact on education. **Kengam, J. (2020)** made a study on "Artificial Intelligence in Education" where the impact of AI on education as well as its

benefits and drawbacks are discussed. The study has also discussed the effects of AI in education after describing a specific method for creating platforms for learning that are AI-enabled. **Khan, M.A. (2021)** wrote an article entitled "Artificial Intelligence (AI) & Education Developing Adaptable Learning Opportunities among Teachers & Learners" where the researcher discussed on meaning of AI and its necessity and role in the field of Education, and also various challenges of AI. The study also revealed the impact of AI on Education in India. **Khan, M.A. (2023)** studied "Artificial Intelligence (AI) in Education: Need of the Hour". In this paper, the researcher has discussed teaching AI, and the different objectives of AI-integrated learning.

3. METHODOLOGY

This is a qualitative study. The researchers have prepared this research paper by reviewing various articles on Artificial Intelligence (AI).

DISCUSSION: *"Our intelligence is what makes us human, and AI is an extension of that quality."*– Yann LeCun Professor, New York University. Artificial intelligence is one of the areas of computer science which focuses on creating intelligent machines that act and think like humans—for instance, ones that can recognize speech and solve problems by using their judgment and learning new skills. John McCarthy (2006), a computer scientist at the California Institute of Technology is known as the 'father of Artificial Intelligence'. Ancient Greece is where the concept of building intelligent machines first appeared, and this is where the history of AI may be found. However modern AI research started in 1950. As an academic discipline, AI was founded in 1955. However, at present significant development has been seen in this field in the inclusion of machine learning and deep learning. Numerous strategies can be found to improve education through the application of AI. AI has enormous potential, and the National Education Policy of 2020 (NEP 2020) encouraged its incorporation into the educational system.

Artificial Intelligence: Artificial intelligence (AI) is the capacity of a machine to carry out cognitive tasks similar to those carried out by humans, such as perception, learning, reasoning, and problem-solving. AI is focused on emulating human decision-making processes and carrying out intellectual activities in a manner akin to that of human tasks comprising problem-solving, learning, understanding languages, recognizing voices, images etc. AI can be defined as "the capability of a machine to imitate intelligent human behavior". The objectives of AI include learning, reasoning, execution and perception. With the help of AI, digital and automated processes get smarter. Additionally, it improves technology's reliability level.

4. DIFFERENT TYPES OF AI

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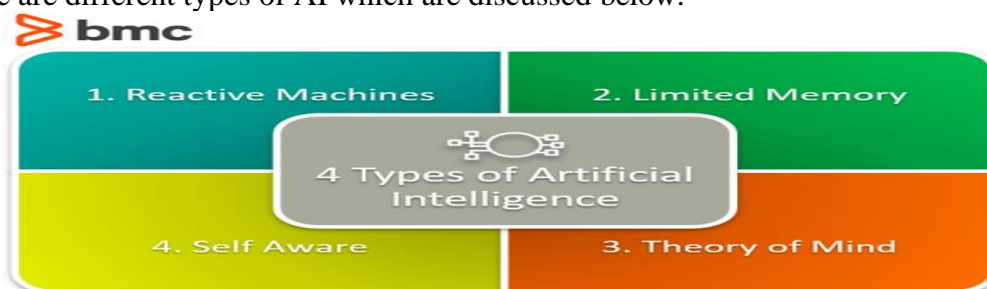
There are different types of AI which are discussed below:

➢ **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.

5. NEED OF ARTIFICIAL INTELLIGENCE IN EDUCATION

➢ Using artificial intelligence, a personalized study schedule can be generated for each learner that takes into account any knowledge gaps. AI makes it easier to determine what a learner understands and fails to comprehend.

➢ AI can change the curriculum and content, making it more interesting and relevant for students. AI is able to recommend and create content that interacts with learners by analyzing enormous amounts of data regarding student preferences, interests and learning outcomes.

➢ AI has the potential to expand and increase the educational experience for students by giving unique methods of accessibility as well as personalized learning catered to each student.

➢ To provide personalized and flexible learning experiences for students, AI involves combining systems with intelligence, computations and data analysis techniques. The purpose of AI in education is to enhance learning results, encourage student involvement and give students the support they need.

➢ It can improve teaching and learning by using multimedia tools to bring abstract concepts to reality. Conventional responsibilities can be undertaken by it, and allowing teachers to concentrate more on teaching and the specific requirements of each student.

➢ AI can assist educators in developing specific plans for instruction and evaluations that are aligned with each student's particular strengths and weaknesses, which can enhance their involvement and inspiration and ultimately result in better academic outcomes.

AI makes it easier for students to access top-notch learning materials, regardless of their location or financial situation. It can help teachers give students more thorough and accurate feedback by evaluating their performance data and identifying areas in which they require development.

6. APPLICATIONS OF AI IN EDUCATION

Application of AI in Education Sector :
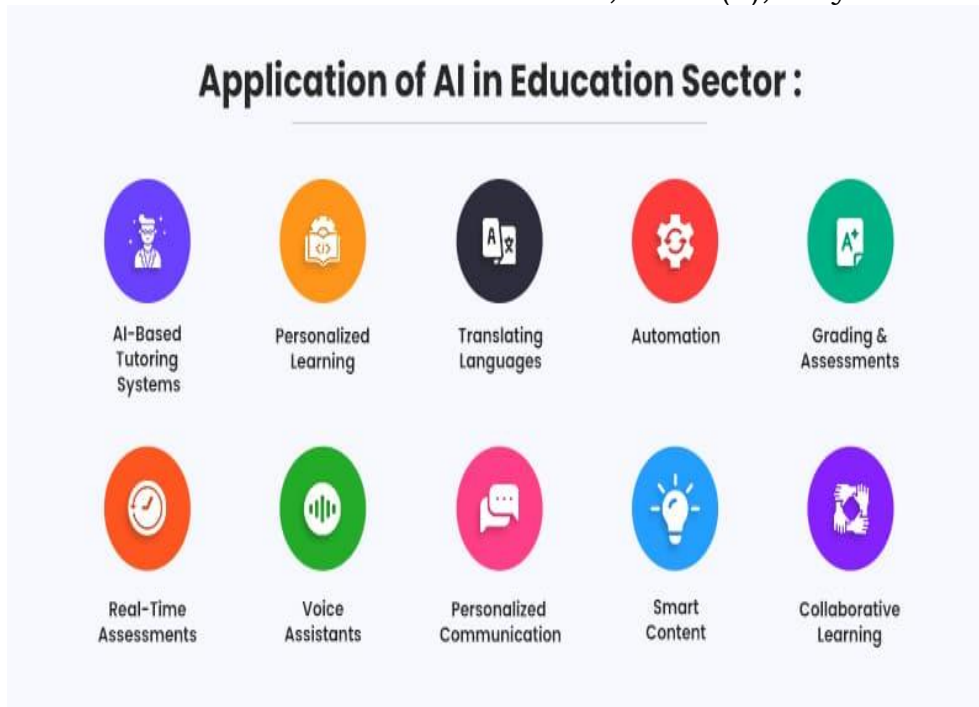
➢ **Personalized Learning**
AI-driven systems tailor educational content to meet individual student needs, adapting to varying learning paces and styles. Tools like intelligent tutoring systems (ITS) provide customized feedback and resources.

➢ **Administrative Efficiency**
AI automates administrative tasks, such as grading, scheduling, and enrolment management, freeing educators to focus on teaching and student engagement.

➢ **Intelligent Tutoring Systems**
These systems simulate one-on-one tutoring experiences, offering interactive and adaptive learning environments that cater to individual student challenges.

➢ **Predictive Analytics**
AI analyzes student data to identify at-risk students and predict academic outcomes, enabling timely interventions to improve retention and success rates.

7. CHALLENGES OF AI IN EDUCATION

➢ **Need for technical expertise**: It may be challenging for teachers who are unfamiliar with AI to incorporate this technology into their teaching practices, and they may require assistance and training to get started.

➢ **Cost of AI tools and applications:** Most of educational institutions lack the funds to purchase and maintain the equipment required to implement AI in the classroom.

➢ **Ethical concerns associated with incorporating AI into the classroom:** Concerns have been raised regarding the implications of AI on privacy, security, and the job economy as it gets more sophisticated. Teachers must be aware of these problems and work to protect their students as they experiment with rapidly growing technology.

➢ **Ensuring inclusion and equity for AI in education:** With the development of AI, the least developed nations run the risk of experiencing new technological, economic, and societal gaps. To

create the fundamental circumstances for putting novel tactics that make use of AI to enhance learning into practice, some major challenges including the fundamental technological infrastructure must be overcome.

➢ **Visions and inaccurate data:** Since AI is developed using data, the underlying data may contain implicit or explicit biases that could lead to prejudice against particular groups based on gender or race. This may worsen already-existing disparities in society and endanger the values of equality and equity in education.

➢ **Data protection:** data security and privacy issues are also receiving more and more attention. To use AI in higher education, it could be required to gather and analyze sensitive personal data such as academic performance and behavioral trends. Institutions implementing AI must ensure that data collected is utilized for that purpose, is not mistreated and doesn't get shared with unauthorized individuals.

8. FUTURE DIRECTIONS
➢ **Ethical AI Development**
Future advancements must prioritize ethical considerations, ensuring AI applications are developed and implemented responsibly.
➢ **Professional Development**
Ongoing training and support for educators will be essential to effectively integrate AI tools in the classroom and enhance pedagogical practices.
➢ **Collaborative Learning Environments**
AI can facilitate collaborative learning by connecting students across different locations and promoting peer interactions through smart platforms.

9. CONCLUSION
AI holds tremendous potential to transform education, offering numerous benefits while also presenting challenges that must be addressed. A balanced approach that emphasizes ethical considerations, equity, and professional development will be crucial as educational institutions navigate the evolving landscape of AI. In conclusion, it can be said that the educational system is being revolutionized worldwide by artificial intelligence (AI). The way AI is transforming how students learn and teachers teach is having an immense effect on higher education in India.. AI has begun to transform how teachers and students interact with one another, from providing customized learning experiences to curriculum optimization. It seems beyond saying that implementing this technology will enable educational institutions to save time, money and resources. Therefore, it should be enthusiastically embraced so that educational institutions and their local communities may benefit from these results, as they certainly help mould the next generation into well-rounded individuals.

REFERENCES:
1. Aggarwal, A. 2020. National Education Policy 2020 and Artificial Intelligence. Retrieved from https://anubudh.com/national-education-policy-2020-and-artificial-intelligence/
2. Chen,L.,Chen,P.&Lin,Z.2020.ArtificialIntelligenceinEducation:AReview.IEEE,8:75264–75278. Retrievedfromhttps://ieeexplore.ieee.org/document/9069875
3. Jain, S. & Jain, R. 2019. Role of Artificial Intelligence in Higher Education- An Empirical Investigation. International Journal of Research and Analytical Reviews, 6(2): 144-150. Retrieved from http://ijrar.com/upload_issue/ijrar_issue_20544069.pdf
4.   Kengam, J. 2020. Artificial Intelligence in Education. ResearchGate. Retrieved from https://www.researchgate.net/publication/347448363_ARTIFICIAL_INTELLIGENCE_IN_EDUCAT ION
5. Khan,M. A. 2021. Artificial Intelligence (AI)& EducationDevelopingAdaptable LearningOpportunitiesamong Teachers & Learners. Edutracks, 20(9): 39-44