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Significant Role of Artificial Intelligence of School Education in India

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Abstract

The emergence of innovative technologies has an impact on the methods of teaching and learning. With the rapid development of artificial intelligence (AI) technology in recent years, using AI in education has become more and more apparent. This article first outlines the significant role of intelligence of school education, such as benefit of teachers, students and administration etc.then analyzes its role on teaching and learning, which has a positive meaning for improving teachers' teaching level, students' learning quality and well management Finally, it puts forward the challenges that AI applications may face in education in the future and provides references for AI to promote education reform.

Keywords: artificial intelligence, school education

Introduction : Artificial intelligence (AI) has been a game-changer in a number of fields recently, and education is no exception. AI will improve the global education system. High dropout rates, a lack of smart content, a lack of textbook-specific content, a lack of personalized learning systems, inflexible exam schedules, and other issues are among the many challenges that educational institutions face today. However, they can also help manage and administer education by integrating data and disseminating it according to the needs of the target audience. The application of AI offers hope for overcoming these obstacles. By using AI as a cooperative tool, education can become more accessible to all, enabling students to develop their cognitive potential and open the door to a better future for themselves. Education can be revolutionized by AI. AI has the power to expedite the educational process and help students accomplish their objectives. It can evaluate the students' past academic performance, pinpoint their areas of weakness, and enhance the next learning opportunities for individualized instruction. AI can be used efficiently to translate professor lectures into regional tongues, which will benefit technical education students.

Purpose Of the Study- The objective or the purpose of this study was to assess how AI has play significant role in teaching, learning, and administration and management areas of school education in India . in this article use of Journal articles, professional publications, website , magazine and professional conference reports identified and used in an analysis that facilitated the realization of the study purpose.

Artificial Intelligence (AI):

Meaning and Concept:

The history of Artificial Intelligence (AI) can be traced from 1950 when Allen Turing, recognised The start of artificial intelligence (AI) times from 1950, when Allen Turing—who is regarded as the field's founder—created a machine known as a "Turing Machine" that possessed intelligence akin to that of a

computer program. However, John McCarthy first used the term artificial intelligence (AI) in 1956, defining it as "the science and engineering of making intelligent machine." Artificial intelligence (AI) refers to a machine that is thought to be able to carry out tasks and find solutions to specific problems just like a human. It can also be explained as a system of computer programs that can perform tasks that typically required human intelligence, such as solving complex puzzles, making decisions, deducing objects, recognizing faces and images, and so forth.as the father of AI, developed a 'Turing Machine' which was enabled with like a computer programme that shows human like intelligence. But the term AI coined by John McCarthy in 1956 who has defined AI as "the science and engineering of making intelligent machine." Artificial Intelligence (AI) is a machine which is considered to have the ability to perform assignments and resolve the certain issues and problems as a human being does. It may also be explicated as a system of computer programme which can do tasks which generally required human intelligence
like resolving complicated problems, making choices and decisions, objects deduction, images and faces recognition and so on. Basically, it's an electromechanical process where a machine thinks, understands languages, solves problems, recognizes and anticipates the environment, adjusts to circumstances, plans its course of action, and so forth. The three main attributes of artificial intelligence are thought to be adaptability, learning, and anticipatory behavior

Stages, Types and Domains of Artificial Intelligence (AI) :

Following are the Stages, Types and Domain of Artificial Intelligence as categorised and explained by Zulekha (2019).

Following are the three stages of AI.

1. Artificial Narrow Intelligence (ANI): It is also called as weak AI. It is the stage where AI includes machines that can do only specifically defined set of tasks. At this juncture, machines can carry out only those tasks which are predefined as it do not have thinking abilities. For examples-Siri, Alexa, Sophia, AlfaGo, the self-driving cars and so on.

2. Artificial General Intelligence (AGI): It is also known as strong artificial intelligence (AI) and is regarded as the development of AI to the point where machines are capable of thinking and making decisions similarly to humans in general. Fortunately, these types of machines do not currently exist, so scientists will likely need to work toward creating machines that will be on par with human intelligence. Conversely, several scientists think that machine learning poses a challenge to human society. Furthermore, as Stephen Hawking pointed out, "the development of full Artificial Intelligence could spell the end of human race."

3. Artificial Super Intelligence (ASI): The capabilities of computers will surpass those of humans by this point in AI. However, in science fiction novels and science fiction films, it is depicted as an assumed or hypothetical stage where machines eventually take over the world.

Types of Artificial Intelligence (AI)

Based on the functions, AI can be categorised into four types.

1. Reactive Machine Artificial Intelligence (RMAI): Such kinds of machines work only on present data by considering the present situations. RMAI cannot decipher inferences from the data in connection to evaluations of their futures course of actions.

2. Limited Memory Artificial Intelligence (LMRI): As the name advocates, it has limited memory and can have refined, informed and improved decisions from the memory of its past data. This kind of AI has the memory useful to store past experiences and for the evaluation of future course of actions.

3. Theory of Mind Artificial Intelligence (TMAI) : It is anticipated to have a big impact on human psychology and is believed to be the most advanced type of AI. The Mind Artificial Intelligence theory places a strong emphasis on emotional intelligence as a way to better understand human thought and belief

patterns. Even though this kind of AI is still in its infancy, a great deal of research is being done on it all the time.

4. Self-aware Artificial Intelligence (SAAI): It is composed of machines that have the potential to grow consciousness and eventually become self-aware. Compared to the theory of Mind Artificial Intelligence, it is less advanced. In this context, Elon Musk (n.d.) has cautioned that "AI is fundamental risk to the existence of human civilization." The various fields of artificial intelligence (AI) are listed below.

1. Machine Learning: This scientific discipline uses machines to process, analyze, and interpret data in order to solve problems. Reinforcement learning and unsupervised learning can both be supervised by machine learning.

2. Deep Learning: It is also called as neuron network. The deep learning is concerned with executing neuron networks on high demands data to deal with insights and formulate.

school education: according to NEP 2020, the new school education system is 5+3+3+4 education system where the students will spend 5 years in strengthening their foundation, 3 years in the Preparatory stage, 3 years in the Middle stage and rest 4 years in the secondary stage. Anganwadi/pre-school (class 1 and class 2) to (secondary stage class 12).

Some Examples of artificial intelligence use in school level education:

eSpark : eSpark Learning stands out for K-5 students. It focuses on math and reading, using games, videos, and interactive sessions.

TutorAI : shines with its AI-powered teaching methodology, particularly for primary schoolers. This platform ensures a well-rounded learning experience by covering a wide range of subjects, from math to history. It's important to create engaging experiences in addition to traditional learning methods.

Personalized learning : Personalized learning is an educational approach that aims to customize learning for each students strength,needs,skills,and interests

Chatbot: Chatbots are conversational tools that effectively carry out repetitive tasks. They are well-liked by people because they facilitate the speedy completion of those errands, freeing them up to concentrate on more complex, strategic, and interesting tasks that call for human abilities that are unmatched by machines.

Adaptive learning : The process of using data-driven instruction to modify and customize learning experiences to each student's unique needs is known as adaptive learning.

SymbMath : Similar to SymPy, SymbMath is a potent AI tool for symbolic mathematics. It is a great option for both simple and complex mathematical computations since it allows users to evaluate, simplify, and solve algebraic expressions and equations. Symb Math's versatility for a broad range of mathematical tasks is further enhanced by its ability to handle matrices, calculus, and other mathematical domains.

GeoGebra: GeoGebra is an AI-powered platform that enhances mathematical exploration and visualization by combining geometry, algebra, and calculus. With its help, users can dynamically explore mathematical relationships, manipulate equations, and create geometric figures.

Grammarly: Grammarly is an AI powered writing assistant that helps students improve their writing skills. It can detect and correct grammar, spelling, punctuation, and style mistakes in real time.

Role of AI in education :

Four key educational domains:

1. ***Learning :*** AI have been applied to (i) assigning tasks based on individual competence, (ii) providing human–machine conversations, (iii) analyzing students' work for feedback, and (iv) increasing adaptability and interactivity in digital environments.
2. ***Teaching:*** AI has been applied to (v) providing adaptive teaching strategies, (vi) enhancing teachers' ability to teach, and (vii) supporting teachers' professional development.
3. ***Assessment:*** AI have been applied to support teachers' work on assessment by (viii) quickly and efficiently evaluate students' work and give them feedback and (ix) predicting students' performance.
4. ***Administration:*** AI has been used for (x) improving the performance of management platforms, (xi) providing convenient and personalized services (non-academic and academic), and (xii) supporting educational decision-making with evidence.

Teachers are benefit from AI -: Rapid changes in the knowledge and information society of the 21st century should be embraced and applied to teachers. Since artificial intelligence (AI) is an important axis of rapid change, artificial intelligence education has been started from elementary school. This change requires elementary school teachers to have basic skills for AI education. It's crucial to keep in mind that artificial intelligence (AI) cannot completely replace human teachers, but it is going to be a useful tool for educators to support students' learning. AI is a powerful teaching tool that teachers use for personalized learning, automated routing tasks, more time for one-on-one interactions with students, and to concentrate on more creative non-teaching activities. AI ALGORITHMS are able to evaluate student data, adjust to their unique learning styles, and offer recommendations and feedback that are catered to each student's requirements. AI facilitates teachers' introspection, planning, and practice improvement. It aids educators in locating holes in their lesson plans and subject matter. It assists in monitoring each student's progress and gives teachers the information they need in the event that a student is having trouble with the course material.

- Prevention of waste of time
- Increase in education quality
- Planning teaching according to student capacity and speed
- Using or choosing effective learning methods using a learning analysis
- Ability to train in smaller groups with effective planning
- More effective individual learning process
- Class room truncation:
- Timely feedback and improved assessments

Students Are Benefit From AI -

1. **Enhance students cognitive skill :** students cognitive power means to the **overall** capacity and potential of students intelligence. it encompasses a wide range *of* cognitive abilities, including perception, attention, memory, language, learning, problem-solving, creativity, and executive functions. ai has the capacity to enhance students cognition and augment our abilities, but it also poses challenges and raises questions about the potential consequences of reliance on ai systems.

2. **Personalised learning for every student:** Students in traditional education frequently adhere to a set curriculum regardless of their unique learning styles and aptitudes. AI has the power to alter this. AI is able to recognize individual learning styles and modify the learning process accordingly. This allows teachers to concentrate on our individual needs and skills, enabling us to progress at our own speed.

3. **Early intervention for struggling students :** AI can play a vital role in helping students who might be struggling academically. AI is able to determine which students require additional assistance and intervention by analyzing data. When learning disabilities are detected early on, students can avoid falling behind and receive the support they need to succeed.

4. **AI-powered content and curriculum :** AI has the potential to transform the content and curriculum, making it more relevant and engaging for students. By analyzing vast amounts of data on student preferences, interests, and learning outcomes, AI can recommend and generate content that resonates with learners. This adaptive content approach ensures that students stay motivated and connected with their studies, fostering a love for learning.

5. **AI in special education :** For students with learning disabilities, the use of AI in special education has the potential to be revolutionary. AI-driven technologies are able to recognize particular difficulties and modify learning plans to meet the requirements of each user. For instance, speech recognition software can help students who struggle with language, and AI-powered visual aids can improve comprehension for people who are blind or visually impaired.

6. **Language learning :** students can practices their language skills,ask,questions,and receive corrections, helping them improve their proficiency and fluency. By generative ai like chat GPT,BingAI, Google Bardare AIchatbots.
7. **Adaptive learning for every students :** Additionally, adaptive learning also modifies the learning content as per students' need which helps them to learn at their own time and pace.
8. **Science learning** : The use of artificial intelligence has played an important role in science teaching and learning at the primary and secondary level.

Artificial intelligence (AI) plays a significant role in school administration :

1. ***Remote Learning and Online Education:*** The use of AI makes learning universally accessible to all students. It is regarded as a boon for students who live in isolated places and for those who are ill or injured and cannot attend classes in person. It allows students to learn from the world's top teachers while at home by removing geographical barriers to education. AI facilitates distance learning, tracks student development, and guarantees the validity of assessments in online learning environments.

2. ***Administrative Efficiency :*** Administrative processes like scheduling, enrollment, and resource allocation are made easier by AI. Routine questions can be answered by chatbots and virtual assistants, freeing up administrative staff to concentrate on more difficult tasks.

3. ***Resource Allocation:*** AI can optimize resource allocation by predicting future student enrollment, staffing needs, and budget requirements. This ensures that educational institutions can allocate resources efficiently and sustainably.

4. ***Data Analysis and Decision-Making:*** AI processes vast amounts of data to provide actionable insights for educational institutions. It can support institutions in making strategic decisions, identifying patterns, and evaluating student performance. This helps them allocate resources more wisely and enhance overall performance.

5. ***Assessment and Feedback:*** AI-driven assessment tools can automate grading and provide instant feedback to students. AI algorithms can evaluate written assignments, quizzes, and tests, offering consistency and efficiency in assessment.

6. ***Adaptive Learning:*** AI adapts content and learning materials based on students' progress and performance. This dynamic approach ensures that students receive the right level of challenge, enhancing their understanding and retention of the material.

7. ***Identifying and bridging learning gaps:*** AI-based assessment system better assess student performance, student's strengths and identify weaknesses, learning gap. Students improve their deficiency.

Equity and quality in education: In India, different regions have varying levels of access to high-quality education. AI can assist us in closing this gap. AI is able to identify areas in which students require additional assistance and resources by analysing data. With this knowledge, policymakers can more effectively distribute educational resources, giving every student a fair chance to achieve. In order to guarantee that AI helps every student, even the most disadvantaged, we advise keeping the following guidelines in mind-

1. ***Co-creation:*** Bring together ed-tech executives and educators from a range of communities who care about equity to work together on AI applications that are well-researched, take into account cultural and local contexts, and do away with preconceived notions and biases.
2. ***Easy entry points:*** By offering open access resources and collaborative spaces to support their integration of AI into their work, we can help teachers access and apply technologies to lessen administrative burdens and deliver more personalized learning.

3. ***Digital literacy :*** To reduce the widening digital divide and help teachers and students overcome obstacles, invest in IT fundamentals and AI literacy. This will ensure that they have access to devices, bandwidth, and resources for digital literacy development.
4. ***Best practice:*** Collect and share inspiring examples of teachers using technologies to support student voice, curiosity, and agency for more active forms of learning to help inspire other teachers to leverage AI in these ways.
5. ***Innovation and adaptation:*** Collaborate with school administrators to promote teacher professional development and cultivate an innovative and flexible culture. Acknowledge and honor teachers who use AI in novel ways, and promote peer-to-peer learning and specialized training.

Advantages Of Artificial Intelligence (AI) :

1. reduction in human error
2. Zero risk
3. 24x7 availability
4. Digital assistance
5. Unbiased decision
6. Fast and effective feedback
7. Automatic correction of learners' answers
8. Providing the advantage of distance education
9. providing platforms that help them create electronic classes

Challenges and Drawbacks of AI : ,

1. ***Privacy:*** Respect for privacy Attempt should be made to safeguard the personal data of the users, especially students. Teachers should make students aware of the fact that the data their personal data are being collected as per their consent. The objective of using AI in education is to focus on learning outcomes and for learning, trust is an essential component. The data provided by the users/students shouldn't be mishandled in any way.
2. **Costs for educational institutions:** The development and implementation of AI technology can be costly for educational institutions. The use of AI in education is particularly expensive when the applications are personalized or have to serve a large number of students. These may be most evident not only in software but also in intelligent teaching robots. Timms' study presents ideas for intelligent Cobot that would have the potential to cost more [18].
3. ***No creativity:*** big disadvantages of ai is that cant learn to think out side the box
4. ***No ethics:*** In recent years, the applications of AI have been gradually adopted to progress our understanding of students' learning and enhance learning performance and experience. However, the adoption of AI has led to increasing ethical risks and concerns regarding several aspects such as Governance & Stewardship, Transparency & Accountability, Sustainability & Proportionality , Privacy, Security & Safety Inclusiveness , Human-centered AI.
5. ***No replaces:*** AI can never replace classroom teachers People have been interacting with AI since years, teachers need to use AI for executing their pedagogical processes and objectives. AI can assist

teacher but would not replace them. AI is run by preprogrammed algorithms, it lacks the talent, experience originality and critical perspective of a teacher.

6. ***Artificial intelligence biases:*** Sometimes biased data is the foundation of AI algorithms, which can result in discrimination and bias in the classroom. These biases include gender and ethnic bias, which can affect AI's judgments about students. Furthermore, a sample of training data that has not been properly filtered and controlled may be biased, leading to incorrect predictions or misguiding the learner during the learning process.
7. ***Lack of human interaction:*** Because AI programs automate the learning process, students using them may also engage with teachers and other people less. These disconnects can impede students' personal growth because it can be challenging for them to acquire social and emotional intelligence in the absence of human connections. As a result, AI may impede the advancement of society.

Coclusion : In today's world, school education is becoming AI dependent . AI is a game-changer in education.They customize learning, fill knowledge gaps, and spark student curiosity.AI to improve the quality of education, enhance teachers' skills, and facilitate personalized learning.For teachers and parents, using AI means unlocking endless opportunities. It ensures our young learners become tomorrow's innovators and leaders. This paper has aimed to discuss the role of AI in teachers school activity, its benefits, drawbacks, and challenges. The application of This article also looks into how intelligent systems can help teachers with assessments, data collection, improving learning outcomes, and creating new strategies. They can also help with personalization, teaching, grading, providing feedback on the quality of courses, setting up a global classroom, keeping an eye on student performance, and much more. Students can benefit from smart tutors and asynchronous learning in advancing learning outcomesAI in school education is significant, but its implementation requires careful consideration of ethical, social, technical, and cultural factors.it also raises concerns about data privacy, bias, and cultural acceptability.

Reference

1. Ad Hoc Expert Group (2020). *Outcome document: First draft of the recommendation on the ethics of artificial intelligence.* United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000373434
2. Ahmad T., Zhang D., Huang C., Zhang H., Dai N., Song Y., and Chen H., "Artificial intelligence in sustainable energy industry: Status Quo, challenges and opportunities," Journal of Cleaner Production, vol.289, pp: 125834, March 2021. https://doi.org/10.1016/j.jclepro.2021.12583

3. Akgun, S., & Greenhow, C. (2021). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AIandEthics*,1–10. https://doi.org/10.1007/s43681-021-00096-7

4. Alagbe, J., Awodele, O., & Ayorinde, I. (2021). Is Nigeria ready for artificial intelligence in schools? Retrieved June 22, 2023, from https://punchng.com/is-nigeria-ready-forartificial-intelligence-in-schools/
5. Annuš, N. (2023). Weigh the Pros and Cons of Using Artificial Intelligence in Education.
6. Kim, K. (2019). An artificial intelligence education program development and application for elementary teachers. *Journal of The Korean Association of Information Education*, *23*(6), 629-637.
7. AnnXä, N. (2022). HRZ Can InWelligenW SRfWZaUe Help Checking Essay-Type Answers of Electronic Tests?, 14th International Conference on Education and New Learning Technologies, pp. 5197-5204. doi: 10.21125/edulearn.2022.1233
8. Chan, C. K. Y., & Tsi, L. H. (2023). The AI revolution in education: Will AI replace or assist teachers in higher education? arXiv preprint arXiv:2305.01185.
9. Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.
10. Chen, X., Zou, D., Xie, H., Cheng, G., & Liu, C. (2022). Two decades of artificial intelligence in education. *Educational Technology & Society*, *25*(1), 28-47.
11. Chiu, T. K., Xia, Q., Zhou, X., Chai, C. S., & Cheng, M. (2023). Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education. *Computers and Education: Artificial Intelligence*, *4*, 100118.
12. Flasiński, M. (2016). History of Artificial Intelligence. In: Introduction to Artificial Intelligence. Springer, Cham. https://doi.org/10.1007/978-3-319-40022-8_1.

13. Gocen, A., & Aydemir, F. (2021). Artificial intelligence in education and schools. *Research on Education and Media, 12*(1), 13-21.

14. Han, H. J., Kim, K. J., & Kwon, H. S. (2020). The Analysis of Elementary School Teachers' Perception of Using Artificial Intelligence in Education. *Journal of Digital Convergence*, *18*(7), 47-56.
15. Jamal, A. (2023). The Role Of Artificial Intelligence (AI) In Teacher Education: Opportunities & Challenges.
16. Karandish, D. (2021). 7 Benefits of AI in Education. The Journal. Retrieved from https://thejournal.com/articles/2021/06/23/7-benefits-of-ai-in-education.aspx
17. Mijwil, M. M., Aggarwal, K., Mutar, D. S., Mansour, N., & Singh, R. (2022). The position of artificial intelligence in the future of education: an overview. *Jour*Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B. P. T. (2023). Ethical principles for artificial intelligence in education. *Education and Information Technologies*, *28*(4), 4221-4241.
18. Panigrahi, A., Joshi, V. (2022). Use of Artificial Intelligence in Education. The Management Accountant Journal. 55, 64² 67 p. DOI 10.2139/ ssrn.3666702.
19. Popenici, S. A. D. and Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. Research and Practice in Technology Enhanced Learning, 12, 22. https://doi.org/10.1186/s41039-017-0062-8

20. Qin, H., Wang, G. (2022). Benefits, Challenges and Solutions of Artificial Intelligence Applied in Education, 11th International Conference on Educational and Information Technology (ICEIT), Chengdu, China, pp. 62-66, doi: 10.1109/ICEI T54416.202 2.9690739.n
21. Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*, 582-599.
22. The Future of Indian Education with Artificial Intelligence (2022). Analytics Insight. Retrieved fromhttps://www.analyticsinsight.net/the-future-of-indian-education-with-artificialintelligence/.
23. Timms, M. J. (2016). Letting Artificial Intelligence in Education Out of the Box: Educational Cobots and Smart Classrooms. Int J Artif Intell Educ 26, pp. 701² 712. https://doi.org/10.1007/s40593- 016-0095-y[iii]