

CHALLENGES OF ARTIFICIAL INTELLIGENCE AND TECHNOLOGY IN INDIAN EDUCATION SYSTEM

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ABSTRACT

India produces more graduates than other countries because it is the most populous country in the world. Artificial intelligence and technology helps to improve the quality of education in terms of progress and strategies that stimulate knowledge and self confidence among students and the teacher community. Lack of infrastructure facility in educational institutions leads backward of educational growth and standard. Not only this, huge investment needs to run the institutions and new strategies should be adopted for future betterment. Unqualified teachers and professors were working in educational institutions for long days; they were only engaged and completed the syllabus with proper explanation to the student community. Guest lecturers were selected for completion of syllabus on contract basis. Moreover, due to financial deficiency, Indian economy was facing more difficulties to introduce new innovations. Government institutions failed to appoint qualified teachers and professors to institutions and to implement the new technology and AI over the country.

Keywords: Artificial Intelligence, Guest Lecturer, Strategy, Economy, Institutions

INTRODUCTION

Education system has been changed from time to time; the scenario of a typical classroom blackboard system to advanced technological integration is a big piece of evidence. Nowadays, Learning happens outside the classroom in various formats by using digital services that is tools to self learn. The contemporary Indian education system carries the new system that educational institutions offer different streams for students all over the country. There is no need to wait for the admission procedure to any college because education is available anytime and anywhere sans restriction. Both students and educational institutions should be updated with the advancements of technology for improving the education level. In 21st century students are well-known about how to use technology and learn things faster and stand ready to employ the technological innovations. Additionally, the pressure on students from parents, family circle, and society is so high that many students are afraid to come up with unique career options. Students are strained into choosing the most flourishing profession in the present market and prepare themselves to like it and endure in it. With these types of pressure, Indian students would be become successful in carrier but they fail to acquire essential skills like knowledge on new innovative technology and AI.

REVIEW OF LITERATURE

This transformative surge of AI in education signals a shift towards more responsive and adaptive learning environments, optimizing language acquisition and instruction to suit the nuanced needs of individual learners and educators. AI, at its core, is a composite of technologies that enables machines to mimic cognitive functions associated with human minds, such as learning and problem-solving. In language education, AI empowers the creation of intelligent tutoring systems, a revolutionary stride (Ali, 2020). These systems are capable of rendering tailored learning experiences, meticulously adapting to the unique learning trajectories, strengths, and areas for improvement of each student. They harness the power of machine-learning algorithms to monitor student performance meticulously and to dispense precise, focused feedback, facilitating more streamlined, and effective language acquisition (Divekar et al., 2022). Expanding beyond tutoring systems, AI has been instrumental in pioneering language learning chatbots and virtual conversational partners, transforming how learners practice and refine their language proficiencies.

ARTIFICIAL INTELLIGENCE IN CURRENT EDUCATION

The mention of artificial intelligence brings to mind a supercomputer, a computer with immense processing capabilities, including adaptive behavior, such as inclusion of sensors, and other capabilities, that enable it to have human-like cognition and functional abilities, and indeed, which improve the supercomputers interaction with human beings. Within the education sector, there has been increased application of artificial intelligence, going over and above the conventional understanding of AI as a supercomputer to include embedded computer systems. I in education initially took the form of computers and computer-related systems, and later, the form of web-based and online education platform. Embedded systems have made it possible to use robots, in the form of cobots or humanoid robots as teacher colleagues or independent instructors, as well as chatbots to perform teacher or instructor-like functions. The use of these platforms and tools have enabled or improved teacher effectiveness and efficiency, resulting in richer or improved instructional quality. Similarly, AI has provided students with improved learning experiences because AI has enabled the customization and personalization of learning materials to the needs and capabilities of students. Overall, AI has had a major impact on education, particularly, on administration, instruction, and learning areas of the education sector or within the context of individual learning institutions (Chen, C. P, L Z, 2020).

Artificial intelligence (AI) is important in education for many reasons, including:

Personalized learning: Artificial intelligence can analyze a student's learning style, strengths, and weaknesses to create customized lesson plans and resources. This allows students to learn at their own pace and improve their understanding and retention.

Improved efficiency: Artificial intelligence can automate administrative tasks like grading, tracking attendance, and creating schedules. This frees up time for teachers to focus on teaching and providing individual student support.

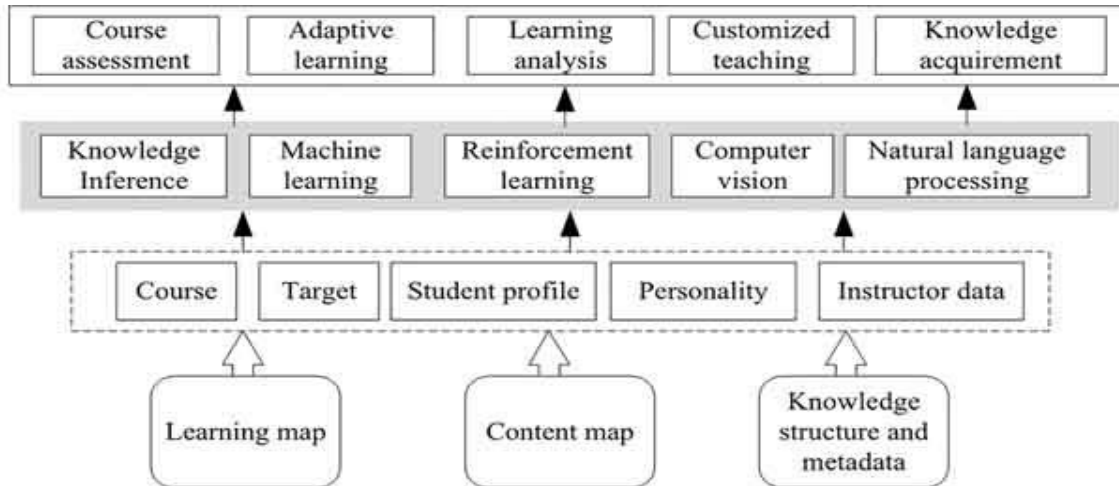
Accessibility: Artificial intelligence can make learning more accessible to students with special needs, such as those who use voice-to-text transcribers.

Early detection of learning disabilities: Artificial intelligence can analyze student interaction and performance data to help identify learning disabilities or difficulties early.

Global connectivity: Artificial intelligence-powered translation services can help students and educators from different linguistic backgrounds collaborate.

Creative learning experiences: Artificial intelligence can be combined with online or VR activities to create immersive learning experiences.

DIAGRAM OF AI EDUCATION SYSTEM



It is a diagram of AI education system, which consists of teaching contents, data and intelligent algorithm, which can be divided into system model and intelligent technologies. Model building data map is crucial for improving learning, which establishes structures and association rules for collected education data. It works as a core in system, with technologies providing power for the system.

ADVANTAGES OF AI AND TECHNOLOGY IN EDUCATION SYSTEM

Here are some potential ways in which generative AI can be used:

1. Parents can leverage virtual assistants to figure out activities they can do with their child to help enhance their reading and comprehension skills. For example, parents can narrate stories generated by the AI to the child or get the child to read aloud a story. This can be especially useful for parents who aren't literate but want to be involved in their child's education.
2. Generative AI can help teachers follow the prescribed guidelines for teaching in an efficient way without spending hours going through multiple reading materials. A virtual assistant built on generative AI can assist a teacher in planning unique and engaging classroom activities by referring to a selection of carefully chosen documents and expert insights and suggesting methods that may work in a class setting.
3. This technology can adapt to the unique needs of a child and so, under the assistance of a caring adult (teacher, parent, or community member), it can be extremely helpful in early childhood

education where learning pace and approaches vary from one child to another. It can be useful in developing foundational literacy and numeracy and teaching basic language skills.

4. Generative AI can assist with speech-to-text, text-to-speech, and speech-to-speech translations, and also adjust the tone and cultural context while translating. This will help in making education more inclusive for children from various linguistic and socio-cultural backgrounds.

5. Generative AI can help create virtual labs on smart phones, especially for students in senior grades and colleges. This will be particularly useful for students from marginalized backgrounds who may not have access to a physical lab to perform science experiments or learn vocational skills. AI can aid in helping them understand these skills and concepts.

6. Virtual assistants can be used to resolve students' doubts and queries and also help them in developing skills such as critical thinking, creativity, problem-solving, and communication. It can be a function of how one trains the virtual assistant to aid students in developing these skills. Students can speak with the virtual assistant in their local language, write and scan text, or type into it directly. Similarly, a school app that uses virtual assistants can be customized for students, teachers, and parents to track assignments, attendance, results, etc.

SCENARIO OF INDIAN EDUCATION SYSTEM

India graduates approximately 10 million people each year, including 1.5 million engineers and 8.5 million regular graduates. However, some say that only 1 in 4 MBAs, 1 in 5 engineers, and 1 in 10 graduates are employable. Here are some other statistics about graduates in India:

In 2021-22, the All India Survey on Higher Education (AISHE) reported that 1.07 crore students graduated. The number of female graduates was higher than male graduates in 2022. The number of universities in India increased from 320 in 2014 to 1,113 in 2023. The number of colleges in India increased from 38,498 in 2014 to 43,796 in 2023. The number of Indian students studying in the United States is growing, with over 140,000 visas issued in 2023.

According to the AISHE survey reported India stands at 33rd rank in 2020. Although it is sad to see India not even in the top 10 list, there is a progressive growth in education in India. In 2018, it stood at 40th rank and in 2019 it stood at 35th rank respectively. Some say that disconnect between the skills taught in academic settings and the practical competencies employers seek is a core problem. Others say that the rise of AI and advanced technology skills has created a demand-supply gap.

Of the graduates from BA courses, 54% are females and from the Science discipline, 53.8% are female students. The highest number of graduates in 2021-22 as per the **AISHE** report is from the Arts Discipline (**Hindustan Times, 2024**). The All India Survey on Higher Education (**AISHE**) 2021-22 conducted by the Union Education Ministry is the 12th edition of the survey. According to the report, the total number of pass-outs increased to 1.07 crore in 2021-22 as against 95.4 lakh in 2020-21. At the undergraduate level, 24.16 lakh students graduated from BA courses, followed by Science discipline with 11.97 lakh graduates. Of the graduates from BA courses, 54% are females and from the Science discipline, 53.8% are female students. At the Post-graduate level, the highest out-turn is observed in Social Science (3.87 lakh) with 58.5% female students and Science has the second highest out-turn (2.61 lakh passed-outs) with 62.6% female students, mentioned the report. At the Ph.D. level, the highest out-turn is in the Science stream (7,408) followed by Engineering & Technology (6, 270).

As report mentioned that the top 5 streams with the highest out-turn at Under Graduate Level. Based on Discipline, Pass-Out were calculated in percentage those are Arts (31.16 %), Science (15.44), Commerce (14.54), Engineering and Technology (10.70), and Education (9.08) respectively. Like that Highest out-turn at Post Graduate Level Social Science (21.8 %), Science (14.7 %), Management (14.4 %), Commerce (10.7 %), and Indian Language (8.2 %) respectively. In research level, the top 5 streams with the highest out-turn at Post Graduate Level and Ph.D. Level those are Science (22.7 %), Engineering and Technology (19.2 %), Social Science (14 %), Medical Science (6.4 %), Indian Language (6.1 %) respectively.

On the other hand, unqualified teachers and professors were working in educational institutions for long days; they were only engaged and completed the syllabus with proper explanation to the student community. Guest lecturers were selected for completion of syllabus on contract basis. Moreover, due to financial deficiency, Indian economy was facing more difficulties to introduce new innovations. Government institutions failed to appoint qualified teachers and professors to institutions and to implement the new technology and AI over the country.

CHALLENGES OF INDIAN EDUCATION SYSTEM

India faces a huge problem in educating the growing number of young people in the country. India has the youngest population in the world with over 50% of the population of 1.25 billion being under the age of 25. According to the UNESCO, India has the lowest public expenditure on education per student in the world. There are differences between India states. The highest expenditure per student is in Kerala (which also boasts 100% literacy levels) with the lowest being Uttar Pradesh in the north of the country. While more than 95% of children now attend primary school, just 40% attend secondary school, according to the World Bank. The curriculum and ways of teaching are old-fashioned, with the emphasis being on rote-learning by copying what the teacher writes on the board, whether the student has understood the concept or not. Teaching in India is wholly focused towards preparing for and passing competitive exams.

Because of the lack of quality public education, private education is popular in India with twice as many people in private education than in public than in the West. Even a slum dweller will pay for private education via a slum school if they can afford it. The number of graduates in India is now equal to the USA and China but with the youth population growing, by 2050 India will have 90 million more graduates of working than USA and 70 million more than China. India faces huge issues in ensuring that these young people are educated on a level to their Western peers so that they can compete on a global stage for jobs and start the startups and social enterprises India needs to become a world super power **Sinead Mac Manus (2015)**.

Over the past decade, AI has been integrated into the education space (**Gaurav Gupta, 2024**). It is being used to streamline students' performance data in schools. For example, in Uttar Pradesh, the Nipun Assessment Test (NAT) is leveraging AI to assess the skills of 1.6 crore students across grades 1 to 8. AI also allows translation from one language to another, and provides individualised learning tools to students. Generative AI can help bridge many gaps in a country like India that has vast cultural and social differences and barriers of inequality. It can be beneficial to various sets of stakeholders in the education system, be it students, teachers, or parents. Recognising the importance of developing AI skills for children, CBSE has introduced AI as a skill module in classes 6–8 and as a skill subject in classes 9–12. Additionally, there are several organisations that are creating virtual assistants for students, teachers, and parents to enable them to learn and teach better. Many such initiatives are now being seen across a diverse set of use cases.

CHALLENGES OF ARTIFICIAL INTELLIGENCE IN EDUCATION

The integration of AI in education is revolutionizing traditional teaching and learning methods, offering new possibilities for personalized learning, enhancing teacher-student interactions, and making education more accessible and efficient (**International school of management and research (2024)**). While AI has significant potential to transform education, its integration also presents a range of challenges. These challenges need to be addressed to ensure that AI's benefits are realized without compromising the quality and integrity of education.

1. Data Privacy and Security

AI systems in education often require access to vast amounts of personal data, including students' academic records, learning habits, and even biometric information. This raises significant concerns about data privacy and security. If this data is not properly protected, it could be vulnerable to breaches, leading to unauthorized access or misuse of sensitive information. Ensuring robust data protection measures and adhering to privacy regulations are crucial to maintaining the trust of students, parents, and educators.

2. Bias and Fairness

AI algorithms are trained on data, and if this data is biased, the AI system may perpetuate or even exacerbate these biases. In education, this can lead to unfair outcomes, such as biased grading, unequal access to learning resources, or the reinforcement of stereotypes. For example, an AI system might favor students from certain demographic backgrounds over others, leading to disparities in educational opportunities.

3. Lack of Human Interaction

Education is not just about knowledge transfer; it is also about fostering social and emotional development. Over-reliance on AI in education could reduce face-to-face interactions between students and teachers, which are crucial for developing communication skills, empathy, and critical thinking. While AI can assist in many aspects of education, it cannot fully replace the human elements of teaching, such as mentorship, encouragement, and personalized feedback. Striking a balance between AI and human interaction is essential to maintaining a well-rounded educational experience.

4. Cost and Accessibility

Implementing AI in education can be expensive, requiring significant investments in technology, infrastructure, and training. This can create a digital divide, where only well-funded schools or

institutions can afford to integrate AI, leaving underfunded schools and students from low-income backgrounds at a disadvantage. Ensuring that AI in education is accessible to all students, regardless of their socio-economic status, is a critical challenge. There is a need for policies and initiatives that promote equitable access to AI-powered educational tools.

5. Teacher Resistance and Training

Many educators may resist the adoption of AI due to concerns about job displacement, a lack of understanding of the technology, or skepticism about its effectiveness. Additionally, teachers need proper training to effectively integrate AI tools into their teaching methods. Without adequate professional development, the potential of AI to enhance education may not be fully realized. Overcoming resistance and providing comprehensive training are necessary steps in ensuring that AI is successfully integrated into the educational system.

6. Ethical Considerations

The use of AI in education raises several ethical questions, such as the extent to which AI should be involved in decision-making processes that affect students' lives. There is also the concern of transparency students and educators need to understand how AI systems arrive at their conclusions and recommendations. Ensuring ethical use of AI requires clear guidelines, transparency, and accountability in AI applications.

7. Dependence on Technology

As AI becomes more integrated into education, there is a risk that both students and educators could become overly dependent on technology. This dependence might reduce critical thinking and problem-solving skills, as students may rely too much on AI to provide answers and solutions. Additionally, technological failures or limitations could disrupt the learning process. It is important to ensure that AI complements rather than replaces traditional educational methods, allowing students to develop a broad range of skills.

8. Content Quality and Relevance

AI systems are only as good as the content they deliver. Ensuring that the educational content provided by AI tools is accurate, up-to-date, and relevant to the curriculum is a significant challenge. There is also the risk of homogenization, where AI might promote standardized content at the expense of diverse perspectives and critical thinking. Educators must carefully curate and monitor the content used by AI systems to maintain educational quality.

9. Lowest public expenditure on Education

India's Public expenditure on education as a percentage of GDP is 4.1 % in 2022. India's public expenditure on education is higher than many other countries in the region. India's public expenditure on education is shared between the central and state governments. The Union government is responsible for 1% of the expenditure, while the states are responsible for 3%. So that government could not introduce new Technology and Artificial intelligence all over the country, because she needs more financial resource to implement it.

10. Reduces Employment in Educational Institutions

The McKinsey Global Institute predicts that by 2023, 14% of employees may need to change careers due to AI advancements. While National Education Policy 2020 suggests greater use of technologies such as AI, it must be aligned with the demand of the job market. In education, not only teachers and professors and others staff must utilize the AI system and tools properly otherwise they will be fired up.

11. Abetment to robotic life and robotism

Robotism refers to the use of robots, the policy of using robots, or robotic behavior. The goal of robotics is to create intelligent machines that can assist humans in many ways. Misjudgment of coding will be dangerous to laymen. Robot will rule the human in future or human doing in robotic manner in field of work.

12. Lack of infrastructure facilities

A lack of infrastructure facilities can have many negative consequences, including Economic impact. Poor infrastructure can make goods less competitive, increase transportation costs, and contribute to inflation. Finally it will be caused to be serious issues on educational quantity and Quality.

CONCLUSION

In Indian education system faces huge challenges while applying new technology and artificial intelligence for flourishing education competitive to lift global standard. Particularly AI will challenge the human mind and human generation. Nowadays AI tools are instructing to their clients with malfunction. AI has no feeling, emotion and care what human has. In future, Robot will rule the entire the world not only human, moreover education system and policy will make

for adjustment of AI. This is serious one, one side of AI is effective and beneficial, same times it has more dangerous to humans.

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