A Critical Study of Portrayal of Artificial Intelligence in Modern Education

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ABSTRACT

Artificial intelligence is the part of science that is created by human intelligence processes in machines, especially computer systems. The main goal of AI is to facilitate human-machine interaction when accessing machines through intelligent systems, human language processing, speech recognition, and computer vision. The demand for AI is increasing around the world. AI is revolutionizing everything from real estate to digital marketing, and education is no exception. In fact, it plays a huge role in teaching and learning. Schools and universities are now leveraging artificial intelligence to improve teaching methods and achieve better outcomes. Currently, 86% of educators believe technology should be an integral part of education. This white paper examines the extent to which AI has transformed India's education sector. Since 2000, there has been a sharp increase in the number of IT companies investing in the education sector to provide students with personalized learning experiences. The result is a positive performance for students seeking to bridge the skills gap between new students and experienced professionals. Through qualitative research, this paper provides an overview of artificial intelligence, its impact on our daily lives, and how it changes the way we think, perceive, and most importantly, our lives. Finally, this article examines various applications of AI in education from the perspective of the Indian education system.

KEY WORDS

Artificial Intelligence, Learning, Education, Machines.

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INTRODUCTION

Technology has always played an important role in education, but the proliferation of smart devices and web-based curriculum has made its use more widespread than ever. With the advent of artificial intelligence in education, artificial intelligence is being used in a variety of ways to help students learn. Artificial intelligence is an approach that allows computers, robots, or products to think like intelligent humans. AI is the study of how the human brain thinks, learns, makes decisions, and functions when trying to solve problems. According to neuroscience, all brains are "mapped differently" and therefore "learn differently." The Indian education system is mainly based on the lack of more interactive and scientific teaching methods, while satisfaction and innovation are generally below average.

Technology has transformed the world of classroom learning, especially during the COVID-19 pandemic. With the spread of smartphones and computers, anyone can now use it easily. This allows institutions to spend more time with their students. Educational institutions have the opportunity to accurately assess students' aptitude, attitude, and interests. First, AI-powered hyper-personalization helps develop customized learning in an environment based on the learning mode and experiential skills performed. Second, the use of intelligent assistants (Amazon Alexa, Google Home, and Microsoft Cortana) and related technologies has great potential to support students.

Third, AI systems help institutions with secondary tasks, such as grading activities, providing personalized attention to students, processing routine and repetitive paperwork, and managing logistical issues. . It'll work out somehow. AI-based analytics can help.

Conduct multidisciplinary academic research to transform library processes and staffing requirements to provide a richer user experience. Most offices, colleges and schools in Delhi and Haryana have introduced innovative use of AI with facial recognition to track attendance. This system saves more than an hour per day, creating additional time for basic educational activities**.**

Concise Background of Artificial Intelligence

YEAR	EVENTS
1956	John McCarthy coined the term "artificial intelligence" and hosted the first AI conference.
1969	Shakey is the first mobile general purpose robot built. You can now do things with a purpose instead of just a list of instructions.
1972	Earl Sacerdoti developed ABSTRIPS, one of the first hierarchical planning programs.
1978	The MOLGEN program, written by Mark Stefik and Peter Friedland at Stanford University, has demonstrated that an object-oriented programming representation of knowledge can be used to design gene cloning experiments.
1980	Development and sales of Lisp machines. First expert system shell and commercial application.
1997	The supercomputer "Deep Blue" was developed and defeated the world chess champion. Creating this great computer was a big milestone for IBM.
2002	The first commercially successful robotic vacuum cleaner was create
2005-2019	Today we see voice recognition, robotic process automation (RPA), dancing robots, smart homes, and other innovations.
2020	Baidu releases LinearFold AI algorithm to medical and scientific and medical teams developing vaccines in the early stages of the SARS-CoV-2 (COVID-19) pandemic. The algorithm can predict the viral RNA sequence in just 27 seconds. This is 120 times faster than other methods.
2021	Facial recognition, text generation, speech recognition, pharmaceutical research, and automatic translation capabilities are some of the achievements AI deserves.

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Literature Review

AI will fundamentally change online education. This has the potential to expand India's online education market, which is expected to reach $1.96 billion in 2021. The role of teachers in the education system is irreplaceable, and AI can support and improve their work. AI is expected to bridge the gap in learning and teaching methods and delivery. By leveraging AI, students receive personalized curriculum, tests, learning strategies, and instruction. This posed a challenge for teachers as it was nearly impossible to manage and provide instruction that met each student's specific needs.

According to Business Today (2023) Report: 47% of learning management tools will be AI-enabled by 2024. Furthermore, AI in the education industry is expected to achieve a CAGR of 40.3% between 2019 and 2025.

Many of his EdTech companies in India develop AI-powered intelligent educational design and digital platforms to provide learning, testing and tutoring to students. Indian startup SpeEdLabs has developed a platform for hybrid learning. In this platform, AI-based adaptive learning complements lecture methods. Its purpose is to provide students with the opportunity to practice at their own pace while identifying and filling gaps in learning and knowledge.

Vivek Varshney, founder of SpeEdLabs, said: We combine the value of professional educator experience with artificial intelligence to find the best solutions to improve each student's conceptual understanding and academic performance. The platform provides AI-based adaptive practices, analytical dashboards, personalized improvement plans, and recommendation engines. Based on the student's activities, strengths and weaknesses during the learning process on the platform, an AI-powered personalized improvement plan is created to bridge the gap between students and teachers. Additionally, SpeEdLabs curate content and adapt it to students' learning curves through personalized content and performance tracking through the portal. AI-based education solutions can read student facial expressions to understand when and where students are having difficulty, and later adapt and modify lessons to meet students' specific needs.

Prem Mohan says: So what does this mean for children? Will AI change the way children learn? Artificial intelligence in education has the potential to be a game-changer for all children. Many schools across the country are already using AI and want to know how it can help their children. The World Economic Forum predicts that by 2025, most companies will have adopted technologies such as ML. These strongly encourage Governments and educational institutions to focus on both STEM and non-cognitive soft skills to meet future needs, and the rapidly increasing number of relevant training and skills**.**

According to a Microsoft report, "Advances in technology will dramatically change the world of work, with up to 50% of existing jobs in the United States alone potentially being replaced by automation.".

The use of artificial intelligence automates administrative tasks and allows teachers to use their time more efficiently. This will improve the quality of education and make it accessible to more people in the form of intelligent content. Digital education can be created in the form of digital textbooks and study guides to increase engagement. AI is reshaping and reinventing education. The combination of teacher expertise and the best facilities will shape the future of education and the entire concept of learning. AI allows teachers to understand their students better and go beyond traditional, old-school teaching and learning styles. Another great benefit of AI-based education is that it introduces students to this technology from a very early age and exposes curious young minds to innovations, ideas, and knowledge about this amazing technology.

## Artifical Intelligence in Ambience of Indian Education

India's school education system is one of the largest in the world. However, India's public (state) education system is weak and underfunded. It is not just about old challenges such as inadequate infrastructure, insufficient skills and a motivated teacher workforce (facing isolation and lack of trust), but also about growing inequalities in the sector that lead to stratification is also a problem. We must also address the new challenges

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of increased privatization and commercialization. The spread of digital technology is also uneven, contributing to stratification.

The main educational challenge contributing to the low learning levels in Indian schools (both public and private) is the reliance on memorization of content rather than meaning-making. Year 2005. The aim is to complement the curriculum by ensuring that the content of the textbooks is memorized by the teacher and reflected in written examinations, which are the main method of assessing learning. Many students do not understand the concepts that the content is trying to convey. According to ASER research, the majority of 8th grade students cannot read their 2nd grade textbooks or solve 2nd grade math problems. Second, due to large class sizes and an insufficient number of teachers relative to the number of classes and departments in schools, teachers are unable to respond to individual learners, learning levels, and learning needs (and /or unmotivated). An understanding and interest in involving students in the learning process. Content, pedagogy, and assessment follow a one-size-fits-all approach, resulting in low levels of learning.

Artifical Intelligence in Education
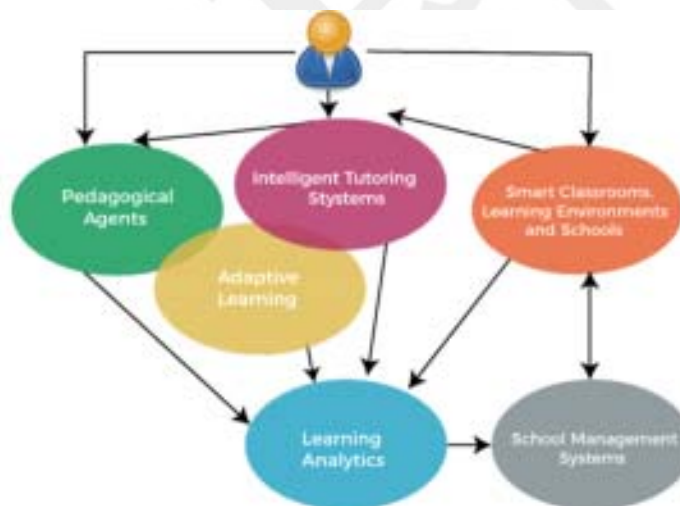
The starting point for AI in its current form is the availability of large datasets. That code is written by humans and generated by machines to extract and analyze data to derive patterns and execute. The fact that in education such big data includes educational content developed by teachers, educators, educational systems, experts, databases of pedagogical approaches/methods, and evaluation databases, as they can be narrowed down through data. It leads to data is relatively static. Dynamic big data includes information about transactions

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(lessons and activities) and student responses to activities and assessments. This big data can be used to develop algorithms that can support:

1. Self-learning through adaptive practice.
2. Personalized instruction that allows for individualized content, pedagogy, and assessment for each student reactions to past activities and reviews.
3. Intelligent tutoring system.
4. Educational agent.
5. School management system.
6. Macro diagnostic and predictive models for all learning groups (by geography, demographic profile, classes, medium of instruction, subjects and other categories).

The goals of organizations designing A.I applications in the education sector include the task of retrieving large amounts of curriculum resources, including metadata about subject areas, relevant grade levels, languages, resource types, file formats, resource levels, etc. Role (Introduction) for example, NCERT lists a set of 31 such metadata elements that can tag resources available in the NROER (National Repository of Open Educational Resources) repository. Another task is to record the actual use of these resources in different learning situations, teacher activities (pedagogy), and learners' reactions to the content. This typically identifies students through assessment procedures aimed at determining their level of learning/understanding. Before and after transactions with resources. By analyzing whether the learner has learned/understood the concept, feedback regarding that particular resource unit and transactional approach is recorded. Record thousands or millions of responses to different resource units of a concept (along with teacher and learner profiles) and combine these resource units and different processing methods with feedback (to obtain positive learning effects), the algorithm helps identify. Effective learning resources and methods in learning contexts. It is believed that identifying appropriate content along a transactional approach will improve the efficiency and effectiveness of education. The same can also support self-learning. Students can respond to assessment activities using the resources provided by the AI engine and provide feedback on their learning from the content and activities provided. Based on the analysis of the feedback, the AI engine makes suggestions to provide more content and activities to the learner.

The Role of Artificial Intelligence in the Indian Education Sector

The advent of artificial intelligence (AI) is a dramatic change not only in the field of technology, where AI is used to automate systems to improve performance and efficiency, but also in the way AI makes daily life easier and more efficient brings. Keeping things simple is rarely appreciated. Artificial intelligence increases the speed, accuracy, and efficiency of human endeavors. AI is now widely used in a variety of areas, including mobile phones, social networks, and active threat prevention and response. Therefore, AI and machine learning tools need to process different types of data to achieve good results. Learning annotations is essential. AI can perform accurate real-time diagnosis of diseases in various fields such as automotive (self-driving cars), virtual assistants or Chat bot, retail and e-commerce, manufacturing, cybersecurity, healthcare, and medical image analysis. Including training.

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Recently, many AI applications have been developed for the education sector. And so many processes have become easier and faster. Students can participate in online courses without interruption and can access all learning materials from their computers, laptops and smart devices, making it easy to participate in courses without attending physical classes. Many automation tasks are also handled by AI, making processes run more smoothly and saving time and money.

Artificial intelligence provides a secure solution to ensure the integrity of online test system assessments in a cost-effective and scalable manner. AI reduces or eliminates the need for physical supervisors and inspectors, making deployments much more scalable. And AI-powered online monitoring provides automatic visibility into such incidents. Alerts are often automated. This makes the system highly reliable for conducting rigorous exams without the hassle and risk of going to a test center. AI-powered remote proctoring makes online exams safe for remote users.

A safe and cost-effective way to prevent cheating in online exams. System algorithms help detect and prevent cheating during the online exam process. From chat bots to automation, AI is increasing day by day in education and we need to see and experience even better AI applications in the future.

➢ **Remote Monitoring using A.I.:** Online proctoring creates large amounts of image/audio/video streams that can also be automatically analyzed using AI-based algorithms. Products such as U-Can Assess and Smart Exam meet rigorous testing standards and remote proctoring services.

➢ **Artificial Intelligence will help you with a fair Examination:** A.I. surveillance assessment uses a combination of artificial intelligence and human observers. Video of test takers taking the test is recorded via webcam, allowing the AI to flag and report suspicious movements and activities. AI-powered proctors are software that often utilizes artificial intelligence (AI) to monitor test takers. It helps educational institutions by recognizing voices and recognizing others as test takers. This innovation also provides the ability to freeze a candidate's computer or phone screen to prevent other tabs from opening on the device. Top examiners can read examinees' eye movements. That is, the test taker is reading on another device or book. You can also record body gestures and movements. In some cases, audio and video recordings of candidates will be made. If a problem occurs, a message will be sent to the authorities

➢ **Learning with Chatbots:**This chat-bot is available 24/7 and can answer questions from students and prospective students about admissions, fees, subjects, classes, teachers, and more. We are available to assist students with any questions they may have at any time of the day. Educational chatbots work very effectively and efficiently. Present specific topics to your students in the form of text, images, videos, or a combination thereof. After learning the subject matter, students take a quiz and present their results to the teacher.

➢ **Personalized Learning with Recommendations:** AI helps students get personalized answers to relevant questions from their teachers. It also helps train students on classroom materials and the problems and questions they will face in online sessions. Students now have a larger system for interacting with their professors. AI provides rapid feedback, works directly with students, and provides all the equipment needed for distance learning.

➢ **Education Across Borders:** AI can now manage education systems, including exams, across borders. AI makes it easy to study any course anywhere in the world, anytime, anywhere. Many AI applications are used in education systems to help students progress in online courses and exams, and to help many schools and universities around the world find suitable students.

Education Platforms based on AI to improve Student Learning

AI is already being successfully used in several education fields to improve student learning and development and educator performance.

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Let's take a closer look at some applications.

A. **Mental Health:** A child's emotional state affects their ability to stay focused, engaged, and motivated while learning. Using emotion recognition technology, virtual schools can be just as effective as in-person learning environments. Gamification also makes learning feel like play. Additionally, AI can help identify where students are having trouble and help them improve and ultimately excel.

B. **The children work together with A.I:** Nao is a humanoid robot that can talk, move, and teach children everything from reading and writing to computer programming. Nao engages kids in science, technology, engineering, and math (STEM) learning and provides fun programming labs. This basic introduction to coding allows students to instruct robots to perform specific tasks, such as: B. Hand gestures or choreographed dance. This gives students the opportunity to get used to telling robots (or programs) what to do and prepare them for a future where robots and humans work together.

C. **Thinkster Math:** Thinkster Math is a tutoring app that combines a math curriculum with a personalized teaching style. This app uses AI and ML to visualize how students are thinking while solving math problems. This allows the tutor to quickly identify areas in the child's thinking and reasoning that need to be addressed. Then, support them by providing instant, personalized feedback.

D. **Brainly:** This educational platform allows students to ask questions about their homework and automatically receive verified answers from their classmates. Ultimately, Brainy can help Students learn faster and use ML algorithms to filter out spam.

F. **Content Technologies Co., Ltd. (CTI):** This A.I company uses deep learning to create customized learning tools for students. The only tool, JustTheFacts101, allows teachers to easily import curriculum into her CTI engine. Machines then use algorithms to create personalized textbooks and coursework based on the core concepts. Cram101 is another example of an AI-powered product. This product can turn any textbook into a smart study guide, providing easy content to study quickly. The tool also generates multiple-choice questions, which helps students save time and study more effectively.

G. **Gradescope:** This platform reduces the time needed for grading (reducing a teacher's grading time by over 70% of her time) and provides student data that shows where additional support is needed.

H. **Duolingo:** With over 120 million users worldwide, Duo lingo has a wide user base that extends beyond the classroom. Available in 19 languages, anyone using the app can learn a foreign language and develop skills over time. With quizzes and other tests, the program adapts to each user's abilities and provides new challenges. I. Third Space Learning: This is an online math tutoring organization. We work with schools to close learning gaps by providing her one-on-one math tutoring to children who need it most. We are a fully accredited partner of the National Tutoring Programmed, providing personalized online math's tutoring to primary and secondary school students across the UK. Areas of expertise: KS2 SAT Intervention Programs, GCSE Mathematics Foundation and More Advanced Interventions.

J. **Little Dragon:** Little Dragon is the first tutoring app that tracks and responds to students' changing emotional states. Emotional AI detects conditions such as boredom or irritation and adapts content to

optimize the learning experience. Little Dragon uses the behavioral and emotional aspects of learning to "see" students and match each learner with a tailored friend/teacher.

Challenges and How TI Overcome?

Recent research suggests that research on A.I in education has primarily focused on developed countries and is limited in developing countries. There are several limitations and challenges that both countries face when harnessing the potential of A.I technology to improve their education systems.

Challenge #1: Comprehensive public policy on AI for development.

AI has great potential to improve education systems, but 360-degree integration of AI into education requires decisive political support. Educational leaders need financial and ethical support so they can focus on giving learners the skills they need to succeed in her AI society. Currently, advances in AI in education are coming from the private sector, such as LightSide, Coursera, McGraw-Hill, Pearson, and IBM, but Governments are struggling to manage them. AI public policy developments in education are still in their infancy, but are expected to increase over the next decade. Government policy must answer questions to develop solutions and policies, support the innovation ecosystem, and harness the power of AI in education.

Several countries have already made significant financial commitments to establishing AI research centers and recruiting and preparing AI experts. The Government is also investing in AI research and education by establishing AI academic excellence centers, grants, and a network of research institutes. Countries such as Argentina, Singapore, Estonia, Malaysia, Kenya, France, South Korea, and Germany have established industry-academia partnerships to share material and financial resources. Collaboration between universities and research institutes facilitates joint research and industry collaboration, promoting industry-academia collaboration.

Challenge 2: AI adoption and equity in education

AI can deepen existing inequalities and divisions, creating a digital divide as disadvantaged groups may be excluded from AI-enabled education. It has a nature.

The digital divide is a new type of divide in leveraging data-driven knowledge to make intelligent decisions.

Equality and inclusion should be core values in policy-making. The urgency of infrastructure development in developing countries Lessons from past experiences with digital rights for rich and poor students bridging the gender gap ,Lack of language and culturally appropriate content. Several policies need to be put in place to address these fundamental barriers. It is important to consider the Internet as a human right and establish some international alliances to build basic infrastructure even for the poorest developing countries. For example: The Broadband Commission for Sustainable Development is active in promoting broadband in developing countries and underserved communities.

Challenge 3: Preparing teachers for AI-powered education

Solving the existing problems faced by teachers is of paramount importance. Teachers remain at the forefront of education, as the creative and socio-emotional aspects of education should never be ignored. In this process, AI-powered software in education must provide a robust framework for cognitive, instructional, and large-scale test results. Several countries are developing policies to support national efforts in the EdTech industry, empowering teachers and schools, fostering innovation, and strengthening their efforts. Consideration should be given to a clear understanding of how AI-powered systems can facilitate learning value judgments. Research and data analysis skills to interpret data provided by AI-enabled systems.

Use AI to perform repetitive tasks help learners develop new skills and competencies that cannot be replaced by machines.

Challenge 4: Building a high-quality integrated data system

The data we have is sporadic, unevenly distributed, and limited. Additionally, learning outcomes are closely linked to students' mental health, socio-economic status, family and background. Additionally, Government policies and related factors can affect academic performance. A fully functional data analysis

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system can open up opportunities for AI-powered predictive and machine learning algorithms. However, the technology used to collect data may prove costly for low- and middle-income countries. Costs and benefits must be carefully weighed.

Challenge 5: Ethics and transparency

When implementing AI, certain social and ethical concerns must be considered. Technology is advancing rapidly, and what is impossible today may be possible tomorrow. Privacy and security are topics that quickly come up in discussions about data ethics. The challenge is to use personal data while ensuring that individuals' privacy settings and personally identifiable information are protected.

Data collection and use must be based on explicit and informed consent, as well as transparency and fairness.

CONCLUSION

AI can be a boon for parents who are constantly paying attention to their children's social lives. Using AI technology, we will be able to monitor our children's online interactions more closely than ever before. Schools use software that analyzes data points such as: How well the material is understood by the students. Next, divide the children into groups according to their needs. AI gives her the ability to access her 24/7 access to teachers and lessons anytime, anywhere. AI can be used as an educational tool to guide students towards their goals through personalized feedback on homework, tests, etc. based on AI algorithms. Artificial intelligence can handle simple tasks, so we don't have to spend time doing mundane tasks like organizing emails or finding files, and automation has the potential to make everyone's lives easier. The future of education is here! AI is a major driver of change in education. There are many benefits of AI. All students have equal access, regardless of learning ability or disability. This makes a big difference because not all children learn at the same pace or have similar skills. With the help of AI, students can make their future brighter.

REFERENCES

1. Aleven, V., McLaughlin, E. A., Glenn, R. A., & Koedinger, K. R. (2016). *Instruction based onadaptive learning technologies.* In Mayer, R.E. & Alexander, P.A., Handbook of research on learning and instruction, 522-560. ISBN: 113883176X

2. Boden, M.A. (2018). *Artificial intelligence: A very short introduction*. Oxford. ISBN: 978-0199602919

3. Duan .Y.Edwards J.S & Dwedi Y. K (2019) Artificial intelligence for decision making in the era of Big –Data –Evolution, Challenges and research agenda. *International journal of in formation Management,* 48,63-71

4. Hammerness, K., Darling-Hammond, L., & Bransford, J. (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do.* Jossey-Bass. ISBN: 0787996343

5. Lamb, R., & Premo, J. (2015). Computational modeling of teaching and learning through application of evolutionary algorithms. *Computation,* 3(3), 427–443.

6. Shehu, Visar & Dika, Agni. (2010). Using real time computer vision algorithms in automatic attendance management systems. 397 – 402

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A Double-Blind, Peer-Reviewed, Referred, Quarterly, Multi Disciplinary and Bilingual International Research Journal

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