



AI Integration in the Educational Systems of the US and India

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ABSTRACT

Artificial Intelligence (AI) has become a ground-breaking force that is changing industries all over the world and surpassing conventional bounds. Our teaching and learning methods are being drastically altered by the widespread use of technology in the educational field. With major improvements in teaching strategies, individualized learning, and general student engagement, artificial intelligence (AI) is revolutionizing the education sector. The application of AI in education in India has shown incredible promise, transformed conventional approaches, and ushered in a new era of creativity and individualized learning. The Office of Educational Technology (OET) of the U.S. Department of Education develops a national education technology policy and establishes the framework for how artificial intelligence (AI) can transform education and facilitate learning for early learners in K–12, higher education, and adult education everywhere, at any time.

Keywords: Artificial Intelligence (AI), United States (US)

1 Introduction

Artificial Intelligence in Education Roll and Wylie (2016) draw attention to Henry Ford's statement, "If I had asked people what they wanted, they would have said faster horses." On the surface, one could argue that schools have evolved into "faster classes" that yield outcomes more quickly. Will these "fast classes" still be in use in the twenty-first century, or will they need to adapt their ways? Does teaching skills, critical thinking, and metacognition suffice as the twenty-second century approaches? Or should we set up brand-new, never-before-considered systems for the modern era? What educational opportunities can artificial intelligence present that would help humans retain their social and emotional characteristics while setting them apart from robots or smart cars? Policymakers and implementers in the sector will likely be focusing on these issues in the near future; in fact, there are already debates on whether or not AI can actually replace teachers (see Felix, 2020). According to Manyika et al. (2017), excellent teachers will still be in need in the future, instructing courses meant to improve students' communication, creativity, and affective intelligence. These writers really contend that advancements in automation and artificial intelligence would make "people more human." Regarding artificial intelligence research in education, Haseski (2019) summarizes the findings



of these studies as follows: implementing AI in education will increase student autonomy, offer successful learning opportunities, help students identify their strengths, foster creativity, and lighten the workload of educators [2]. There are, however, opposing viewpoints as well. Research on artificial intelligence suggests that shifting teaching responsibilities to machines could be dangerous (Humble & Mozeliuss, 2019). According to Wogu, Misra, Olu-Owolabi, Assibong, and Udoh (2018), states and nations must develop a teacher profile that will cooperate with these support systems in order to get ready for this future [2]

Although research on artificial intelligence in education has gained a lot of attention lately, studies on the theory of general artificial intelligence date back at least to the 14th century and were revived by Alan Turing's work in 1937 (Humble & Mozeliuss, 2019). They are currently gaining prominence in scientific circles and academic literature. With the emergence of "artificial intelligence leadership" in the literature (see Canbek, 2020), we observe an expansion of AI research in organizational management [2]

Significant changes to education systems and procedures are anticipated as artificial intelligence is used more in the classroom. According to Sekeroglu, Dimililer, and Tuncal's (2019) findings, artificial intelligence has the potential to assist educators in providing more individualized instruction to their pupils. According to Pedro, Subs, Rivas, and Val Verde (2019), artificial intelligence can give marginalized groups and communities—such as those with impairments, refugees, out-of-school individuals, and those living in remote areas—access to better and more relevant learning possibilities. According to research, artificial intelligence techniques and intelligent learning environments can help deliver personally designed approaches that are beneficial (Mohammed & Watson, Artificial intelligence aims to improve education and quality at all levels, particularly by offering personalization, even if it appears that human teachers must actively participate in order to provide high-quality instruction (Grosz & Stone, 2018). Pedro et al. (2019) highlight a dual-teacher model with artificial intelligence in terms of individualized education: teachers spend a lot of time on administrative and routine tasks, like repeating things over and over again and answering questions about a variety of topics. However, secondary teachers who are assisted by artificial intelligence in the classroom will cut down on routine procedures, allowing teachers to concentrate on one-on-one communication and student guidance. [2]

2 Functions of Artificial Intelligence in US Education System

AI-Powered Educational Games

Teachers have always understood the importance of play-based learning, and since the early days of computer gaming, educational computer games like The Oregon Trail, which was originally launched in 1974, have been used in classrooms. Thanks to user-responsive programming, AI- powered games of today may provide customized learning. [4]. Platforms for Adaptive Learning Leaders in educational technology like Carnegie Learning and Knewton provide adaptable systems that allow for real-time customization of learning materials and activities. Ongoing evaluation enables real-time input and aids in systemic method



modification. Simple rules-based systems and complex machine learning algorithms are two examples of adaptive learning approaches. [4]

Automated Systems for Feedback and Grading

Artificial intelligence systems can help teachers spend more time and energy interacting with students by automating administrative, planning, and grading tasks. This is a typical justification for implementing AI in the classroom.[4] 4.Chatbots for Supporting Students Many universities use chatbots to assist students by answering questions about admissions, providing reminders, and linking students to course material and student services. Students can enhance their writing abilities, maximize their study time, and generate ideas with the aid of other chatbots. [4]

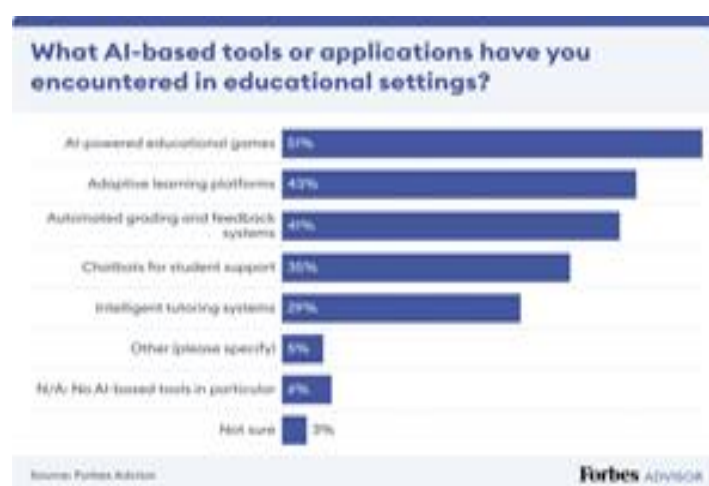
Intelligent tutoring programs

Frequently devoted to a single subject, like language or maths, intelligent tutoring systems replicate the one-on-one interaction of a human tutor. The Khanmigo tutoring system from Khan Academy and the Duolingo app are two examples [4]

Functions of AI in Indian Education system

Tailored education

Through individualized instruction, students can thoroughly explore their interests and skills while also receiving focused support in areas where they struggle. We can empower students to take charge of their education and develop a passion for lifelong learning by creating an atmosphere where they can learn at their own speed. Additionally, by pushing students to investigate many viewpoints and find original solutions to problems, the application of AI in education fosters creativity and critical thinking abilities, two traits that are crucial in the quickly changing world of today. Teachers take on the role of facilitators, helping each student reach their greatest potential through personalized learning. [1]



Intelligent tutoring programs intelligent tutoring systems are capable of identifying areas of weakness, providing targeted feedback, and making individualized recommendations for improvement through the analysis of student data. These systems continuously assess the performance of the learners and modify the educational tactics and content difficulty level



accordingly. Additionally, intelligent tutoring systems have been shown to improve student outcomes quite successfully. These technologies give students the confidence and sense of success they need to take charge of their education by offering them tailored advice and real-time feedback. [1]

Flexible Evaluations

Adaptive assessments make use of algorithms to offer a customized educational experience that optimizes the potential of every student. Consider the following situation: a student is taking a math's test. The system immediately examines their responses, assesses their level of competency, and identifies areas that require development. Adaptive assessments give teachers accurate information about their students' comprehension while also enabling students to monitor their own development. Every learner will have the chance to succeed at their own pace and experience a sense of accomplishment along the way thanks to India's adoption of artificial intelligence in the classroom. [1]

Online Classrooms

Real-time video conferencing, chat functionality, file sharing, and interactive whiteboards are all made possible by virtual classrooms' sophisticated interactive features. Additionally, the education sector can apply AI to seamlessly integrate online tests, multimedia content, and real-time feedback systems. Through engaging visual simulations, students can go into the depths of space or explore historical landmarks. Additionally, students have the ability to engage with teachers and educators worldwide. Students gain new insights and a more comprehensive grasp of the subject matter as a result. [1]

AI-assisted Content Production

This creative method creates top-notch instructional materials, from interactive multimedia tools to textbooks, by utilizing sophisticated algorithms and machine learning approaches. AI in education gives teachers access to a multitude of current and customized resources for their pupils by automating the content development process. The capacity of AI-powered content generation to modify information in accordance with the demands and learning preferences of specific students is an important feature. Artificial intelligence (AI) in the education sector can detect knowledge gaps through data analysis and adapt instructional materials appropriately, guaranteeing that students receive pertinent information that meets their individual needs. [1]

Analytics Predictiveness for Student Achievement

Through extensive data analysis, this system can forecast students' performance in the future and customize interventions to optimize their achievement. Teachers can uncover trends and elements that affect academic success by using predictive analytics to understand more about students' learning habits. Personalized recommendations are also provided by predictive analytics for every student's educational path. Educators can provide individualized materials and methods by knowing each student's strengths and shortcomings. Making adjustments to teaching strategies guarantees that every student gets the help they need to succeed [1].

The Potential of AI in Education across the United States



Organizations including as UNESCO and the U.S. Department of Education (ED) have advocated for a transparent, human-centered approach to the use of AI in education in response to its increasing prevalence. In order to create AI solutions that complement and support teachers' traditional duties rather than try to replace them, ED advises giving educators' viewpoints top priority. In collaboration with state organizations like the California Department of Education, UNESCO promotes equity-focused AI in educational policies that aim to reduce technological disparities both locally and globally. Prominent AI firms have started to modify their products to take into account the particular requirements and worries of the educational sector with regard to the responsible application of AI. For instance, ChatGPT Edu, a version of ChatGPT tailored for higher education institutions, was released by OpenAI in May 2024. This version of the well-known platform has improved security and privacy, doesn't use data or conversations to train Open AI models, and has educational features like document summarization and the opportunity for teachers and students to create and share personalized GPT models. Even if artificial intelligence raises new issues for the education industry, the majority of instructors surveyed expressed optimism about the future. [4]

India's Artificial Intelligence Prospects: Potential Uses and Efficiency

Artificial intelligence (AI) has gained international recognition as a technological technology with the potential to improve educational practices and functions when used appropriately. Although numerous scientists worldwide have established its efficacy, it has also been considered a hazard to human life. Though the range of possible efficacy depends on the goals and intentions of its usage, business establishments and the educational sector have a wide variety of promising applications. Many scientists, as well as futurists and writers of science fiction and science films, were speculating and forecasting decades ago that the rapidly evolving nature of artificial intelligence and its implications will bring about catastrophic and apocalyptic changes in human lives and society. [1] The following explains promising uses of AI in educational functions and practices in relation to their potential efficacy.

Customized Learning Experience

AI-powered learning processes may include better teaching methods and approaches that can readily adjust to the learning styles and speeds of individual pupils. With AI-enabled personalized learning, students will receive learning experiences tailored to their needs; those who are more comfortable with textual materials will receive them, those who are more comfortable with audio and video materials will receive them, and so on.

Quality Content Delivery

The most important educational issue is the creation and distribution of intelligent content. A system powered by artificial intelligence (AI) can produce and distribute high-quality audio and video content, as well as convert traditional textbooks into digital versions. Students of all grades and skill levels can benefit from the creation of a new learning interface. Teachers can construct more complete curricula with AI-driven gadgets and a lot of illustrated audio and video by using Cram101 and Netex (Agarawal, 2020).



Equality and Equity in Learning Opportunities

AI-enabled educational systems are viewed as a means to provide equitable access to education for all individuals, provided that all stipulations remain impartial. Millions of students are attempting to enroll in schools, colleges, and universities or are currently studying; they should all have access to high-quality education. Since individualized e-curriculum, tutorial programs, and skill-based learning applications are being developed globally, AI-enabled education systems can guarantee more equitable and equal learning opportunities for students. These systems will put classrooms at their fingertips and enable students to access education based on their needs and abilities. They may also be able to adapt to the latest trends in education worldwide.

Interactive Teaching-Learning

AI-enabled educational systems are thought to be more interactive since they offer personalized interaction options. A program powered by AI, machine learning, and algorithms can repeat learners' instructions as many times as necessary. With no effort, this allows students to ask questions, get their doubts answered, comprehend the ideas, and go back and modify the material.

Remote Learning

AI-driven educational systems include remote learning as one of their subjects. Everyone who wants to attend lessons remotely or from home can do so thanks to AI, which can transmit e-content in the form of audio and video instructions. Millions of students in remote areas may not be able to attend schools, but they can still benefit from the AI-powered, easily accessible, and automated educational system.

Curriculum Upgrade

AI-powered learning systems can forecast whether a curriculum is appropriate and compatible with students. It can assess and recommend teaching techniques, abilities, and strategies as well as instructional materials, activities, test formats, and systems that are appropriate for various student populations. Through the provision of feedback and future projections, it can facilitate the education system's frequent curriculum upgrades based on student needs, interests, and compatibility.

Management of Dropouts

A number of factors contribute to dropouts. Although analyzing the reasons behind probable dropouts is difficult, it is anticipated that an AI-driven system would be able to recognize the list of possible dropouts. The Andhra Pradesh government and Microsoft AI, however, have successfully launched a project to identify and manage dropouts in Vishakhapatnam (Bhandari, 2020). AI-enabled devices are able to foresee events by recognizing students' actions, analyzing their performance, and determining the reasons behind their actions and possible reasons for leaving school.

Grading and evaluation

Teachers need days to complete grading and evaluation, but AI can handle these tasks simultaneously. In order to do this, an AI-powered system can broadcast audio and video and



detect people and images just like a person can when writing an exam under proctoring. So that it can read the answer script, identify and comprehend the activities of examinees, and accurately grade the pupils based on their performance and merits. Furthermore, as AI-enabled tools can recognize faces, images, movements, and instructions, they may also eliminate the time-consuming exercises required for both competitive and at-home exams.

Research Activities

It is anticipated that AI's capacity to recognize language, scripts, images, faces, and voices will also be useful in research activities. In the future, if AI-enabled technologies become widely used, it may be possible to find similar studies, choose a research design with justifications, code, filter out data, analyses, interpret, and more. Remote Proctoring: AI enabled teaching learning process, examinations and other activities of learners could be monitored from the remote by AI through face, voice, and actions recognition abilities it has. As with the help of algorithms, AI receives as well understands human instructions and actions, and transmits the same to the required ends.

Assistance for Learners with Disabilities

AI-powered instruction could address the needs of learners with disabilities since it can map each learner's needs and abilities using voice, image, and facial recognition, enabling AI to support them individually in all areas of instruction and learning. Additionally, compared to a typical instructor, it might be able to create an inclusive learning environment and provide the best teaching strategies and resources for them. Doing a SWAT analysis of these students can also have a significant impact because it can identify their learning gaps and modify their learning style and pace appropriately.

Remote Proctoring

Using its facial, speech, and activity recognition capabilities, AI can remotely supervise students' activities, exams, and other teaching and learning processes. AI accepts and comprehends human commands and activities, much like with the aid of algorithms, and delivers them to the appropriate locations.

Management of Events and Resources

AI could be useful in maximizing the utilization of institutional resources. It might identify the location of the files or documents and provide them whenever and whatever is required. By using face and action recognition, object deduction, and the ability to follow directions much like a human, AI-enabled robots or algorithms may eliminate the need for manual labor in event management by performing tasks that several staff members would need to perform at various times.

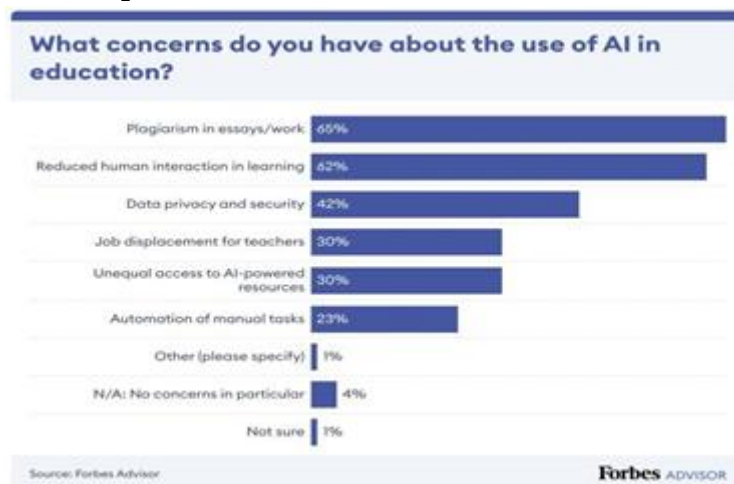
Feedback

AI is able to provide real-time feedback as it continues to work on the performance trends of each student while carrying out the teaching and learning process or other tasks because of its special abilities in face, script, image, and deduction recognition and deduction, as well as its ability to follow instructions, including human actions. In an AI-enabled teaching and learning process, students and those worried about their academic performance can receive immediate



feedback.

Training and Skill Development:



Research indicates that AI can effectively enable training and skill development initiatives for educators and other staff members. Since the AI-enabled computer application can understand the directions, identify the faces and pictures of participate in the same way as people do. Creating an AI-enabled training program allows for the instillation of the expertise in the teachers. One-on-one training based on need will also be available. Additionally, AI is capable of responding appropriately to commands (speech or actions).

Artificial Intelligence in Education Challenges in the US

Students, educators, and educational institutions must consider how to employ AI in the classroom ethically as its use grows. Because of their ability to encourage cheating and spread false information, chatbots like ChatGPT have caused controversy among educators. In addition, experts and observers have brought out important issues with algorithmic bias, data privacy, and access inequalities in relation to AI. Teachers are concerned about cheating and the absence of human interaction in the classroom. The main reason why educators are worried about AI in education is academic dishonesty. Teachers are also concerned that if AI is used more, students may interact with people less. [4]

Artificial Intelligence in Education Challenges in India

Like many other technological tools and methods, artificial intelligence (AI) has numerous problems and difficulties from the standpoints of society, the educational system, government policy, policy execution, and so forth. The probable obstacles that the AI-driven educational system may face are as follows.

(i) Inability of schools to fully adopt the AI-driven education system; (ii) Social and religious taboos around AI adaptation; (iii) socioeconomic backgrounds of students; (iv) The government's ad hoc approach; (v) Lack of a national policy on AI; (vi) Financial exchequer; (vii) Poor infrastructure at every educational level; (viii) Sustained functional electricity supply; (ix) Sustained functional internet connectivity; (x), AI-trained personnel, (xi) Students' awareness gap, (xii) Public and Private; Students' attitudes towards AI in urban and rural areas



(xiii) Lack of emotional components, (xiv) Teachers don't physically participate, (xv) The potential for the value system to deteriorate, (xvi) Teachers' status and dignity are in jeopardy, (xvi) Teachers' and other staff members' employment opportunities were abruptly reduced, (xvii) Cybersecurity threat, (xviii) Problems with data management, (xix) Problems with proper AI programming, (xx) fairness and equality in access to educational systems powered by AI, (xxi) Possible danger to race and human civilization, (xxii) Education focused on facts and information rather than knowledge, (xxiii) Students' and employees' possible health risks, (xxiv) Possible promotion of a materialistic culture, (xv) The potential for centralized control over the entire educational system, (xvi) The potential for arts and humanities subjects to disappear, (xxvii) No opportunity for therapy and guidance, (xxviii) Over-reliance on AI in the educational system, etc.[1]

3 Conclusion

Among scientists, education experts, policymakers, and other education system stakeholders, artificial intelligence has emerged as one of the most contentious topics. Since AI has promising applications in the education system with regard to teaching and learning processes, administrative tasks, managing resources and events, assessment and grading, equal opportunity in access to education, remote and proctored learning, curriculum upgrades, predictions about potential dropouts, inclusion-oriented education systems, and more, it is regarded as the guardian of the future education system at every level if it receives full coverage in implementation and application in the educational realms.

References

1. Artificial_intelligence_ai_and_indian_education_system_promising_applications_potential_effectiveness_and_challenges.
https://www.researchgate.net/publication/352044231_artificial_intelligence_in_education_and_schools
2. <https://www.igauge.in/blog/detail/ai-education-in-india-six-transformative-ways-technology-is-shaping-learning/159#:~:text=by%20automating%20the%20content%20creation,student%20needs%20and%20learning%20styles>.
3. <https://www.forbes.com/advisor/education/it-and-tech/artificial-intelligence-in-school/>