

THE ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN THE EDUCATION FIELD

Dr.B.Gomathi Jaya

Assistant Professor,

Department of Commerce,

Madurai Gandhi N.M.R.Subbaraman College for Women,

Madurai, Tamil Nadu, India.

E-Mail ID: gomathijay86@gmail.com

Phone No: +91 9092234168

Abstract

Artificial Intelligence (AI) in education is quickly changing conventional learning settings and providing creative ways to improve administrative, instructional, and learning procedures. By customizing learning experiences to meet the needs of each individual student, artificial intelligence (AI) technologies like machine learning, natural language processing, and intelligent tutoring systems are transforming personalized education. Real-time feedback, support for a variety of learning styles, and increased student engagement are all made possible by these technologies. AI is also essential for automating administrative work, which frees up teachers to concentrate more on teaching. This essay examines the many ways artificial intelligence (AI) is being used in education, such as predictive analytics, virtual assistants, automated grading, and intelligent tutoring

systems. It looks at the advantages and difficulties of AI in education, highlighting the necessity of ethical issues and the significance of teacher preparation for efficient use of AI tools. Though cautious use and continued study are necessary to guarantee fair access and results for all students, artificial intelligence (AI) has the potential to develop more inclusive, effective, and data-driven learning environments.

Keywords: Human Intelligence, Super Intelligence, Problem-Solving, Learning.

Introduction

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think, learn, and act like humans. AI systems can analyze data, make decisions, and perform tasks that typically require human intelligence, such as:

1. Learning
2. Problem-Solving
3. Reasoning
4. Perception
5. Language Understanding

Artificial Intelligence has its roots in computer science, mathematics, and engineering. The term "Artificial Intelligence" was coined in 1956 by John McCarthy, a computer scientist and cognitive scientist.

AI has evolved significantly over the years, from simple rule-based systems to complex machine learning algorithms. Today, AI is applied in various industries, including:

1. Healthcare
2. Finance
3. Transportation
4. Education
5. Customer Service

Types of AI

1. Narrow or Weak AI: Designed to perform a specific task, such as facial recognition or language translation.
2. General or Strong AI: Aims to perform any intellectual task that a human can, such as reasoning, problem-solving, and learning.
3. Super intelligence: Significantly more intelligent than the best human minds,

potentially leading to exponential growth in technological advancements.

AI Techniques

1. Machine Learning: Enables machines to learn from data without being explicitly programmed.
2. Deep Learning: A subset of machine learning that uses neural networks to analyze data.
3. Natural Language Processing: Enables machines to understand, interpret, and generate human language.

Uses of Artificial Intelligence (AI) in the Education Field:

The biggest ethical issues of AI in teaching center on privacy, equity, and autonomy. While collecting and analyzing student data benefits personalized learning, there are some privacy concerns.

The education industry has a moral obligation to ensure that less affluent communities can afford AI technology costs and to avoid educational inequalities as we rely on it.

Equally important, because AI algorithms potentially influence academic paths and life opportunities, reliance on AI for educational decisions should not undermine human autonomy, nor should it be a replacement for human intelligence.

- ✓ Continuous dialogue among teachers, technologists, and policymakers
- ✓ Developing and implementing robust regulatory frameworks
- ✓ Designing AI for education with ethical AI principles

The bottom line is privacy and security laws or guidelines should always incentivize tools to enhance, not undermine, educational fairness and human dignity.

1. Create Personalized Video Learning Experiences:

AI adaptive learning platforms like Smart Sparrow or Docebo create personalized educational journeys. They analyze data and create unique learning plans for different user profiles. By making learning more adaptable and interactive, they make it stick.

Synthesia and other text-to-video AI tools are extremely helpful in education. In minutes, they can turn any writing into a video lesson. The lesson is presented by an AI avatar (a digital double of a real actor) and can be in almost any language.

2. Provide AI Tutors and Learning Assistants:

AI in education isn't about replacing teachers. In fact, AI tutors and chatbots can assist teachers and provide one-on-one support for student learning. These virtual

assistants make the learning experience more efficient and focused and the school more fun.

A tutor will give step-by-step problem-solving assistance. Schools can deploy one for subjects where students commonly struggle. Alternatively, AI chatbots answer key questions around the clock, reducing response time.

3. Fast-Track Science, Programming, and Language Learning:

Some artificial intelligence solutions on the market are excellent for explaining complex concepts. Science, programming, and language learning particularly benefit from using AI. That's because these topics are more intimidating and complex. Breaking them into manageable lessons makes the study more approachable and enjoyable.

Labster, for instance, creates virtual science labs. It helps spark curiosity and make learning hands-on and effective, with students conducting experiments and simulations.

Similarly, Codecademy is packed with step-by-step programming lessons. And the Khan Academy includes practice exercises and instructional videos for all levels.

4. Teach through Educational Games and Simulations

Educational games and simulations teach the hard stuff in a way that doesn't feel like learning. This particular application of AI

means learning can truly become an enjoyable experience.

Sophisticated AI systems create adaptive learning environments. In other words, they tailor the study content to each student's learning pace and style. And AI analytics show educators how students perform and their learning patterns.

All it takes is for the AI games and simulations to align with the curriculum. They'll improve student motivation and knowledge. In fact, 88% of teachers who use digital games in the classroom say children respond very well.

5. Promote Universal Access to Education for Disabled Students

Nearly 240 million children worldwide have some disability. But AI can give these children universal access to education. Customized learning instruments that help with specific needs have the power to change lives.

6. Teachers can use Artificial Intelligence Assistive tools to:

- ✓ Help disabled learners navigate and interact with educational resources.
- ✓ Customize learning interfaces and content for various learning disabilities.
- ✓ Implement AI text-to-speech and speech-to-text emerging technologies for

students with visual or hearing impairments.

For example, Microsoft Learning Tools makes texts more accessible with the Immersive Reader function. JAWS can read the screen for users with vision loss. And those with hearing difficulties can use Otter.ai for real-time transcriptions.

7. Automate Grading and Provide Instant Feedback

Artificial intelligence systems are the sidekicks that catch students' mistakes. But instead of shouting them out, they whisper tips to improve. They can tell each student how to improve in a personalized, effective way.

This specific use of AI in education isn't just about reducing the teacher's workload. This technology is also helping children learn faster, feel more confident, and reach their goals.

8. Analyze Student Performance for early Intervention

Early intervention can change a student's learning trajectory big time. AI can look at performance data and analyze various metrics. It will quickly spot at-risk children and tell which ones need extra support. At the same time, AI has some more potential benefits, as it can:

- ✓ Provide insights to customize intervention strategies.
- ✓ Forecast potential academic challenges and enable proactive support.

difficulty level and content in real-time, providing a more accurate measure of student knowledge.

9. Automate Administrative Tasks

Teachers can have a magic helper robot. Not an actual robot but a tool or platform that handles all the boring paperwork and school chores. This automation means educators get back the time and mental energy to be with their students and teach. And the schools get smarter by having all learning materials organized.

Google for Education has an entire suite of instruments to automate classroom management and communication. And School Mint automates enrollment, school choice, and other administrative processes. Such AI-driven technology helps teachers regain control of their time and manage their classes better.

Advantages of Artificial Intelligence (AI) in the Education Field:

Improved Personalization

1. Tailored Learning Experiences: AI helps create customized learning plans tailored to individual students' needs, abilities, and learning styles.
2. Adaptive Assessments: AI-based adaptive assessments adjust their

Enhanced Student Engagement

1. Interactive Learning Tools: AI-powered interactive learning tools, such as simulations, games, and virtual labs, increase student engagement and motivation.
2. Intelligent Tutoring Systems: AI-based intelligent tutoring systems provide one-on-one support to students, offering real-time feedback and guidance.

Increased Efficiency

1. Automated Grading: AI-powered automated grading systems reduce the time and effort required to grade assignments and exams.
2. Data Analysis: AI helps analyze large datasets, providing insights into student performance, learning outcomes, and educational trends.

Better Accessibility

1. Accessibility Tools: AI-powered accessibility tools, such as text-to-speech software, help students with disabilities access educational resources.
2. Language Support: AI-based language support systems assist students who are

non-native speakers, providing real-time language translation and support.

can lead to technical difficulties and distractions.

Improved Teacher Support

1. Teacher Assistants: AI-powered teacher assistants help teachers with tasks such as grading, data analysis, and student support.
2. Professional Development: AI-based professional development platforms provide teachers with personalized learning recommendations, helping them improve their teaching skills and subject matter expertise.
3. Cost-Effective: AI-powered educational tools and platforms can reduce costs associated with traditional teaching methods.
4. Scalability: AI-based educational systems can be easily scaled up or down to accommodate changing student needs and enrollment numbers.

Disadvantages of Artificial Intelligence (AI) in the Education Field:

Technical Issues

1. Glitches and Errors: AI systems can be prone to technical glitches and errors, which can disrupt the learning process.
2. Dependence on Technology: Over-reliance on AI-powered educational tools

Limited Contextual Understanding

1. Lack of Human Touch: AI systems lack the human touch and emotional intelligence, which can lead to a lack of empathy and understanding.
2. Inability to Understand Nuances: AI systems can struggle to understand nuances and subtleties in language and behavior.

Bias and Inequality

1. Bias in Data: AI systems can perpetuate existing biases and inequalities if they are trained on biased data.
2. Exacerbating Existing Gaps: AI-powered educational tools can exacerbate existing gaps in education, particularly for disadvantaged students.

Job Displacement

1. Replacement of Human Teachers: AI-powered educational tools can potentially replace human teachers, leading to job displacement.
2. Changes in Teacher Roles: AI can change the role of teachers, requiring them to adapt to new technologies and teaching methods.

Dependence on Data Quality

1. Data Quality Issues: AI systems are only as good as the data they are trained on, and poor data quality can lead to inaccurate results.
2. Data Privacy Concerns: AI-powered educational tools can raise concerns about data privacy and security.

Cost and Lack

1. High Development Costs: Developing AI-powered educational tools can be expensive, making them inaccessible to some institutions.
2. Lack of Transparency: AI decision-making processes can be opaque, making it difficult to understand how decisions are made.

Conclusion

Artificial Intelligence (AI) is transforming the education sector by enhancing the learning experience, improving student outcomes, and increasing efficiency. AI-powered adaptive learning systems, intelligent tutoring systems, and automated grading tools are making education more accessible, effective, and personalized. As AI technology continues to evolve, it is essential for educators, policymakers, and researchers to work together to harness its potential and create a brighter future for education.

Reference

- 1) <https://www.ed.gov/sites/ed/files/documents/ai-report/ai-report.pdf>
- 2) <https://wjarr.com/sites/default/files/WJARR-2024-1217.pdf>
- 3) https://www.researchgate.net/publication/351082272_Role_of_Artificial_Intelligence_in_Education
- 4) https://www.ijeltsjournal.org/wp-content/uploads/2022/07/vol4_no4_iss8.pdf
- 5) <https://www.jetir.org/papers/JETIR2402146.pdf>