



## ARTIFICIAL INTELLIGENCE (AI) A NEW TECH APPROACH FOR TEACHING–LEARNING PROCESS

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### Abstract

*Artificial Intelligence (AI) has emerged as a transformative technology with the potential to revolutionize the education sector. As a new tech approach, AI facilitates personalized learning, enhances educational experiences, and supports instructors in delivering more efficient and engaging lessons. This abstract explores the role of AI in the teaching-learning process, focusing on its ability to tailor educational content to individual students' needs, monitor their progress in real-time, and provide immediate feedback. AI-powered tools such as intelligent tutoring systems, automated grading, and virtual assistants enable instructors to focus on more complex tasks while improving the overall learning outcomes for students. Furthermore, AI fosters an interactive and adaptive learning environment, where students can engage with content at their own pace, receive real-time support, and access resources beyond traditional classroom settings. However, the integration of AI in education also raises concerns related to data privacy, equity in access to technology, and the role of educators in a tech-enhanced environment. This paper discusses these challenges and proposes strategies for successfully implementing AI in educational systems to ensure equitable, inclusive, and effective learning experiences for all students.*

**Key Words:** Artificial Intelligence (AI), Tech approach, Teaching–Learning Process

### Introduction:

In recent years, Artificial Intelligence (AI) has rapidly advanced and found applications across various sectors, including healthcare, finance, and entertainment. However, one of the most promising areas for AI's impact is in education. The traditional methods of teaching and learning are often rigid and standardized, failing to address the diverse needs and learning styles of individual students. AI offers a new tech approach to revolutionize these traditional systems, creating dynamic, personalized, and more engaging educational experiences.

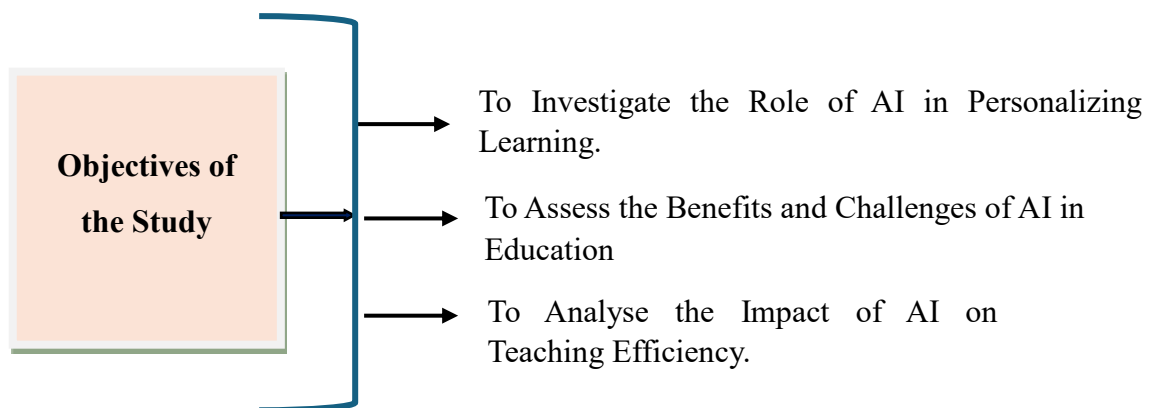
AI's potential in education lies in its ability to process vast amounts of data, recognize patterns, and adapt to the specific needs of students. Through intelligent algorithms, AI can personalize learning pathways, automate administrative tasks, and provide real-time feedback, thereby enhancing both teaching and learning. For educators, AI can alleviate some of the time-consuming tasks such as grading and managing student progress, allowing them to focus on providing more meaningful and creative

instruction. For students, AI-powered tools enable them to learn at their own pace, providing tailored resources and support that can foster better retention and understanding of concepts.

Furthermore, AI technologies such as machine learning, natural language processing, and data analytics enable the creation of intelligent tutoring systems, virtual classrooms, and adaptive learning platforms. These systems are capable of adjusting the curriculum and learning strategies based on individual student performance, making learning more interactive and effective.

Despite the transformative potential, the integration of AI into education comes with its own set of challenges, such as ethical concerns around data privacy, the digital divide, and the evolving role of teachers in an AI-enhanced classroom. Nevertheless, as AI continues to evolve, it promises to reshape the educational landscape by making learning more accessible, inclusive, and efficient. This new tech approach not only transforms how students learn but also how educators teach, encouraging a more interactive and customized educational experience for all.

#### Objectives of the Study:



#### Concept of Artificial Intelligence (AI):

Artificial intelligence (AI) is the new concept and pantomime of human information strategies, for illustration, talk and visual affirmation, elucidation of the tongues and virtual choice making by machines and robots. The capacity of machine to think and act like individuals, has given AI an exceptional put in all areas. Artificial intelligence (AI) is accessible wherever in diverse parts of our lives starting from shrewd sensors to person partners. Later improvements in AI have gotten various colossal changes in the higher instruction field.

- ✓ An intelligent entity created by humans.
- ✓ Capable of performing errands intellectuals without being expressly instructed.
- ✓ Capable of considering and acting normally and humanely.

Artificial Intelligence (AI) is the recreation of human insights forms by machines, particularly computer frameworks. Particular applications of AI incorporate master frameworks, normal dialect handling, discourse acknowledgment and machine vision.

**Need of Artificial Intelligence (AI) new tech approach:**

The integration of Artificial Intelligence (AI) into the education sector has become increasingly necessary due to the evolving demands of modern education and the limitations of traditional teaching methods. AI offers innovative solutions to address several challenges faced by educators, students, and educational institutions. Below are key reasons why AI is needed as a new tech approach in education:

1. **Personalization of Learning:** Traditional classroom settings often follow a one-size-fits-all approach, which fails to meet the diverse needs of students. AI can personalize learning by tailoring lessons, assignments, and assessments based on individual student strengths, weaknesses, and learning styles. Personalized learning ensures that students receive content at an appropriate level of difficulty, pace, and complexity, enhancing overall engagement and knowledge retention.
2. **Enhancing Student Engagement and Motivation:** AI-powered tools can create interactive and immersive learning experiences, such as gamified lessons, virtual simulations, and AI-driven tutoring systems. These tools not only keep students engaged but also foster motivation by offering real-time feedback, rewards, and adaptive challenges. By providing a more stimulating environment, AI helps maintain students' interest and enthusiasm for learning.
3. **Efficient Administrative Support for Educators:** Teachers are often burdened with time-consuming administrative tasks such as grading, tracking student progress, and managing classroom activities. AI can automate many of these tasks, allowing educators to focus on more meaningful and creative aspects of teaching. For example, AI can assist with grading essays or assignments, track learning patterns, and even identify students at risk of falling behind, helping educators intervene early.
4. **Real-Time Feedback and Support:** AI enables the provision of real-time feedback to both students and teachers. Intelligent tutoring systems can assess student responses and provide instant suggestions or explanations when errors are made. This immediate support helps students correct misunderstandings and reinforces learning in a timely manner, preventing gaps in knowledge from widening.
5. **Scalability of Education:** AI can help scale education to meet the growing demand for high-quality learning resources. It enables the creation of virtual classrooms, online courses, and learning management systems that provide access to education across geographical and economic boundaries. AI can support a larger number of students without compromising the

quality of instruction, making education more accessible to diverse populations, especially in underserved or remote areas.

6. **Data-Driven Decision Making:** AI can analyse vast amounts of data from student interactions, assessments, and progress over time. This data can be used to make informed decisions about curriculum design, teaching strategies, and student support services. AI-driven analytics can identify patterns and trends, allowing educators and administrators to refine educational strategies and improve student outcomes.

### **To Investigate the Role of AI in Personalizing Learning**

Personalized learning has become one of the most sought-after advancements in education, particularly as traditional teaching methods may not fully accommodate the diverse learning needs, styles, and paces of individual students. AI, with its capability to analyse vast amounts of data and adapt to changing circumstances, holds great promise in revolutionizing how learning is personalized. Investigating the role of AI in personalizing learning involves understanding how AI systems can customize educational experiences to meet the specific needs of each student, fostering a more effective, engaging, and efficient learning environment.

Here are the key aspects to explore when investigating AI's role in personalizing learning:

#### **1. Adaptive Learning Systems**

AI can be utilized to develop adaptive learning systems that adjust the difficulty and pacing of educational content based on a student's performance in real-time. These systems continuously monitor how well a student is grasping the material and adjust accordingly. For instance, if a student excels in a particular topic, the AI system can present more challenging material, whereas if a student struggles, it can provide additional resources or offer remedial lessons to reinforce understanding. Adaptive learning platforms, such as intelligent tutoring systems, are designed to ensure that students are neither overwhelmed nor under-challenged, optimizing their learning experiences.

#### **2. Tailored Content Delivery**

AI-powered tools can provide students with personalized learning pathways by curating content that matches their learning styles, preferences, and levels of prior knowledge. For example, a visual learner may be offered more video-based or graphical content, while an auditory learner may engage with audio-rich resources. AI can also recommend supplementary materials such as articles, videos, or exercises based on a student's specific interests or weaknesses. This ability to tailor content delivery ensures that learning is more engaging and effective, meeting the unique needs of every learner.

#### **3. Real-Time Feedback and Assessment**

One of the most powerful features of AI in personalized learning is its ability to provide real-time feedback. Traditional assessments, such as exams or papers, often provide feedback after a delay, which may limit the opportunity for students to adjust and improve. With AI, students can receive immediate feedback on quizzes, assignments, and tasks, enabling them to understand their mistakes and correct

them quickly. Moreover, AI can continuously assess a student's progress and adapt its approach to ensure that students stay on track, providing instant interventions when necessary.

#### **4. Learning Analytics and Insights**

AI systems can analyze extensive datasets on student performance, identifying patterns and trends that human educators might overlook. By leveraging learning analytics, AI can provide teachers and students with valuable insights into a student's strengths, weaknesses, learning preferences, and overall progress. This data can be used to customize lesson plans, suggest targeted interventions, or even recommend specific courses of action to enhance learning. Furthermore, AI systems can predict student outcomes, helping educators proactively address potential issues before they become significant challenges.

#### **5. Support for Diverse Learning Needs**

AI plays a crucial role in personalizing learning for students with diverse needs, including those with learning disabilities or language barriers. AI-powered assistive technologies, such as speech recognition, text-to-speech, or language translation tools, help ensure that all students can access the content in a way that suits their specific needs. For example, a student with dyslexia might benefit from AI-driven reading tools that highlight text or provide audio narration. Similarly, AI can support students with limited proficiency in the language of instruction by offering real-time translations or language assistance.

#### **6. Enhancing Student Engagement and Motivation**

AI-based personalized learning systems can enhance student engagement by offering tailored challenges, interactive lessons, and gamified experiences. By analyzing individual progress and preferences, AI can present students with the most appropriate level of challenge—one that is neither too difficult nor too easy. This dynamic approach fosters a sense of accomplishment and motivation, as students are more likely to remain engaged when the learning process is aligned with their capabilities and interests.

#### **Benefits and Challenges of AI in Education**

##### **Benefits:**

1. **Personalized Learning:** AI enables tailored educational experiences for individual students, adjusting the pace, content, and delivery style according to their learning needs, preferences, and progress. This helps in addressing diverse learning styles and ensuring more effective learning outcomes.
2. **Efficiency in Teaching:** AI can automate time-consuming tasks such as grading, administrative work, and student assessments. This allows educators to focus more on teaching and student engagement, improving overall instructional quality.

3. **Real-Time Feedback:** AI-powered tools provide immediate feedback to students, helping them correct mistakes and reinforce learning instantly. This accelerates the learning process and keeps students on track.
4. **Enhanced Student Engagement:** Interactive AI-driven tools, such as gamified learning platforms and virtual assistants, can make learning more engaging and fun. These tools motivate students to actively participate and stay engaged in their learning process.
5. **Scalability and Access:** AI can help scale educational services, providing access to quality education in remote or underserved areas. AI-powered online learning platforms ensure that education can reach a broader, more diverse audience.

### **To Analyse the Impact of AI on Teaching Efficiency:**

Artificial Intelligence (AI) has become a powerful tool in the education sector, promising to significantly enhance the efficiency of teaching practices. By automating repetitive tasks, streamlining administrative processes, and providing real-time insights, AI allows educators to focus more on delivering high-quality instruction and less on time-consuming administrative work. Below is an analysis of the impact of AI on teaching efficiency.

#### **1. Automating Administrative Tasks:**

One of the primary ways AI improves teaching efficiency is by automating routine administrative duties. These tasks can include grading assignments, managing attendance, tracking student progress, and generating reports. For example:

- **Automated Grading:** AI systems can grade assignments, quizzes, and even essays, providing instant feedback to students. This reduces the time teachers spend on grading and allows them to focus on other aspects of teaching.
- **Attendance Management:** AI-powered systems can automatically track student attendance through facial recognition or digital check-ins, reducing the time teachers spend on roll calls.
- **Data Management and Reporting:** AI tools can quickly analyze student data and generate reports, allowing teachers to gain insights into individual or class-wide progress without manually sifting through data. This enables faster decision-making and targeted interventions.

#### **2. Personalized Learning Pathways:**

AI can create personalized learning pathways for students, which is a significant time-saver for teachers. AI-driven platforms adapt content to match the individual needs, pace, and learning style of each student. By doing this, AI can:

- Automatically adjust the difficulty level of tasks based on a student's previous performance.
- Suggest additional learning resources or materials when a student struggles with a particular concept.
- Offer tailored exercises or activities for advanced students who may require more challenging content. This automation of personalization reduces the time teachers spend trying to address

the varying needs of their students, allowing them to focus on those who need additional support or engagement.

### **3. Real-Time Monitoring and Feedback:**

AI can provide real-time feedback to both students and teachers, enhancing the efficiency of teaching. Traditional assessments can take days or even weeks to grade, but AI-powered systems can instantly assess student work and provide actionable insights. For instance:

- **Instant Feedback for Students:** Students receive immediate feedback on assignments or quizzes, helping them understand their mistakes and make corrections before misconceptions deepen.
- **Tracking Student Progress:** AI tools can track a student's progress in real-time, identifying areas where they may be struggling and alerting the teacher promptly. This helps in early identification of issues that may otherwise go unnoticed.

This reduces the time teachers would typically spend analyzing student work individually, and ensures that interventions can occur earlier, keeping students on track and reducing the need for extensive remedial work later.

### **4. Content Delivery and Lesson Planning Support:**

AI can assist teachers in lesson planning by providing recommendations on content, resources, and instructional strategies based on student needs and progress. AI-powered tools can:

- Suggest materials or teaching methods that have proven effective for similar student groups.
- Identify common areas of difficulty and recommend specific activities or exercises to address those areas.
- Help teachers quickly access a variety of resources such as videos, readings, or quizzes tailored to the lesson plan.

This support allows teachers to save time on the preparation of materials and ensures that the lesson plans are more aligned with student needs, improving the overall efficiency of the teaching process.

### **5. Virtual Teaching Assistants:**

AI-powered virtual teaching assistants can handle tasks such as answering student questions, managing online classrooms, and providing personalized assistance. This allows teachers to:

- Offload routine student inquiries (e.g., about assignment deadlines or lesson content) to AI chatbots or assistants.
- Monitor student participation in virtual classrooms, flagging students who are disengaged or struggling.
- Manage student queries about learning resources outside of class hours, reducing the burden on teachers for after-hours support.

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