



Application of AI in Rural educational institutions in Assam: Prospects and Challenges

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ARTICLE DETAILS	ABSTRACT
Research Paper	Artificial intelligence (AI) is relatively new concepts to human society.
Received: 19-07-2026	But the concept and its usages have been capturing popularity among
Accepted: 18-08-2026	different groups of people. Students, teachers and academicians are
Published: 25-09-2026	showing enthusiasm to it to avail readymade materials to their fields of
Keywords:	necessity. Artificial intelligence (AI) is transforming the teaching and
<i>Artificial intelligence,</i>	learning landscape by enabling modified learning tools, experiences,
<i>education, learning,</i>	instruments as well as data and information, etc. It has been enhancing
<i>challenges, outcome</i>	administrative efficiency through automation, and providing data-driven
	insights into student performance. Different countries across the Globe
	have been adopting AI enabling teaching learning methods in their
	respective institutions. India too has been thinking about the use of AI in
	educational institutions as an experiment since few years back. Many
	learning resources are achieved in different internet sites as readymade
	data and information. However, integrating AI presents challenges for
	the rural educational institutions in Assam as there has been lack of
	infrastructure development, skilled and trained faculties, connectivity
	problems pertaining to internet network, etc. There is the ethical
	concerns, the risk of a digital divide, potential bias and unfairness in AI
	system. To overcome these challenges, there should be integrated efforts
	from government, faculties and students to make the application of AI as

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society friendly. The future of AI in education will necessitate a balanced approach that maximizes AI's benefits while cautiously addressing its ethical, decent and practical propositions for all stakeholders, specially the learners and teachers concerned.

Introduction

Human society has seen many ups and downs from the past to the present. The discovery of Artificial intelligence (AI) in recent times, has gained much popular and enthusiasm all over the globe. It is no longer up for debate that an emerging AI-centric society will be a divergence from norms like- how we live, move, do our day to day business, and conduct our daily life activities.

*Artificial intelligence (AI) is technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy.*¹ It may be the futuristic path finder to new generation in many ways. *In 2024, most AI researchers, practitioners and most AI-related headlines are focused on breakthroughs in generative AI (gen AI), a technology that can create original text, images, video and other content.*² Artificial intelligence (AI) is related with digital computer. Therefore, it is said that- *AI is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.*³

In line with this, there are strong indications that 'AI' will completely transform our life style, workplace, skill demands, and businesses, academic atmosphere, and so on. These anticipated changes are also expected to affect the existing teaching and learning environment of education sector which may bring positive and negative implications. That cannot be predicted right now but the experiment is going on and its outcomes are expected to be fruitful within short span of time. Much more is the consideration that in no distant time, these dynamics will lead to a shift from student-teacher relationship to student-AI-enabled Personal Assistant relationship. That is the anticipated era of artificial general intelligence (AGI). *Artificial general intelligence (AGI)- sometimes called human level intelligence AI- is a type of artificial intelligence that would match or surpass human capabilities across virtually all cognitive tasks.*⁴

Origin of the concept of AI

In 1950's, a British mathematician and computer scientist Alan Turing envisioned the possibility of artificial intelligence. This is where AI's origins really begin. To Turing, a computing machine would initially be coded to work according to that program but could expand beyond its original functions. During that time,



Turing lacked the adequate knowledge of technology to prove his theory because computing machines had not been developed to that point. But he is credited with conceptualizing artificial intelligence (AI) before it came into today's position or in actual use. ***He also developed a means for assessing whether a machine can think like human beings, which he called "the imitation game" but is now more popularly called "the Turing test."***⁵

In 1956, a mathematics professor John McCarthy of Dartmouth College in England invited a small group of researchers from various disciplines to participate in a summer workshop on the topic of possibility of thinking machines.

The workshop came into conclusion that, "Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it"⁶ It was the founding pillar of artificial intelligence.

During the summer Dartmouth workshop which was held two years after Turing's death, McCarthy envisioned digital computer is capable of performing human-like functions. ***In outlining the purpose of the workshop that summer, he described it using the term it would forever be known as, "artificial intelligence."***⁷ Since then, the efforts of developing artificial intelligence was going on at different levels in the world. Those who have contributed a lot to this effect includes- ***computer scientist Joseph Weizenbaum⁸, Ernst Dickmanns, a scientist working in Germany⁹, Dr. Cynthia Breazeal¹⁰, computer scientist Geoffrey Hinton¹¹, etc. etc.***

Many intellectuals, scientists, thinkers, institutions and funding agencies along with computer and software companies have contributed a lot to develop, modify and to make AI functioning like human brains. After a long effort the dream of AI as dreamt by Alan Turing has come into being. The journey of AI has started and it has been successfully introduced in many fields of human requirements.

There is vast and extensive research works across the globe to use and to get fruitful result from AGI. The researchers have been using AI to this effect and have become able to create Artificial General Intelligence (AGI). ***Creating AGI is a primary goal of AI research and of companies such as Open AI,¹² Google,¹³ and Meta.¹⁴ A 2020 survey identified 72 active AGI research and development projects across 37 countries.¹⁵***

Artificial Intelligence in India

India has been actively trying to expanse its Artificial Intelligence (AI) capabilities, determined by government projects like - India AI Mission. It is a national strategy focusing on AI for all, and to address



societal needs in healthcare, agriculture, education and smart cities. The country swanks high AI skill saturation and is a growing knowledge hub for AI talent and startups, with a vision to become global leader in the field.

The government of India has introduced Artificial intelligence (AI) to transform education sector by personalizing learning through adaptive tools, automating administrative jobs for teachers, providing supportive technologies for students with differently abled, and providing intelligent career guidance. These government initiatives have been supported and included in NEP 2020. The Key applications of AI include- intelligent tutoring systems, AI-powered content creation, and curriculum integration, etc.

India has 1.5 million schools, more than 8.5 million primary and secondary teachers and more than 260 million enrolments into the school system every year. In the higher education space, more than 40 million students enroll in more than 1000 universities and 42000 colleges annually.¹⁶ This has led to hindrance for educated youths to avail employment or to become engaged in their respective works where skill is required. But the education sector in India was characterized with fixed curriculum, traditional knowledge sharing system, and static testing concepts. In such a juncture, the advent and use of AI, has changed things which has been providing necessary data and information to move forward to personalization, making it relevant and effective for contemporary skill oriented education. The introduction and application of Skill Enhancement Course, Multi-disciplinary Course, Ability Enhancement Course, Value Added Course, etc are the example of such change and shifting of education from standardized to personalized one. ***In the race for skilling for Viksit Bharat 2047, these step changes are causing a paradigm shift and helping Indian education come at par with global systems.***¹⁷ As part of India, Assam has also adopted National Education Policy-2020 with full caution. The journey has been started since August, 2023 and the impact of it is being realized in the teaching learning domain. The Royal Global University in Assam has introduced AI method in teaching sector experimentally. This is in experimental stage and future adaptation of the applicant of AI will take some time after the experiment is over and its positive outcomes are seen.

Artificial Intelligence in Assam

Artificial Intelligence (AI) has made a massive impact in education sector in Assam. AI is mainly used in education as a problem solving assistant. It is being introduced to rural schools in Assam to develop academic sector through specific apps for attendance and performance tracking, personalized learning, and chat bots for student support in the form of Siksha Setu App. ***The App in Assam was introduced in 2023. It was officially launched on April 24, 2023, with a "School Profile Updation Week" following from April***



24 to 30.¹⁸ But the proper execution of AI is challenged by the problems like digital divide, poor internet connectivity, problems pertaining to local dialects and lack of digital literacy among old teachers, especially in rural areas in Assam. *As of August 31, 2025, Assam has 33,394 Lower Primary (LP) schools, 6,343 Upper Primary (UP) schools, and 4,563 Secondary/Senior Secondary schools.*¹⁹ There are more than 321 Degree Colleges and 25 Universities in the state imparting higher education across the state of Assam. These institutions are mostly located in rural areas. *Approximately 93.9% of educational institutions in Assam are in rural areas. This high percentage reflects the fact that a significant majority of Assam's population lives in rural areas, and the state's educational infrastructure is heavily concentrated in these regions.*²⁰ The introduction of AI in educational institutions in Assam has bright future if it is implemented in proper way with the support of all academicians and other staff associated with the system.

- **Prospects of AI in rural education:** The Prospects of AI in rural educational institutions in Assam may bring fruitful results. These may include-

- i) **Personalized Teaching-Learning:** AI can analyses student performance and create customized teaching cum lesson plans in more systematic way. It will be particularly beneficial for students who need additional help by maintaining student records.

- ii) **Administrative automation:** AI reduces the administrative burden on teachers by automating tasks like attendance tracking, grading, and performance analytics. This allows educators to focus more on teaching and mentoring.

- iii) **Intelligent tutoring systems (ITS):** AI-powered tutors simulate one-on-one teaching. Systems like Carnegie Learning and 'Tutor Mitra' can assess student strengths and weaknesses, offering real-time feedback and targeted support.

- iv) **Skill development and career guidance:** Platforms like AICTE's NEAT use AI to recommend skill-building courses aligned with a student's interests and the job market's needs. This aligns education with employability, a key priority for India.

- v) **Increased engagement:** AI-powered tools like educational apps and voice-enabled feedback can make learning more engaging, and some may even help with pronunciation.

- vi) **Academic support:** AI can make routine administrative tasks like tracking of attendance, freeing up teachers to focus more on instruction and one-to all support.

- vii) **Improved access to resources:** AI-powered platforms can provide help to the students with access to a wider range of academic materials and information.

- viii) **Better communication Skill:** By applying the 'Shiksha Setu App', AI can improve communication between schools, students, and guardians, leading to better outcomes in the respective domain.



ix) **Up to Date Information:** AI provides Up to Date Information about all relevant field. Therefore, by applying the application of AI carefully and consciously, one can take its fruitful benefits.

• **Challenges to AI implementation:** The challenges in front of uses and implementation of AI in Rural Area of Assam are-

x) **Connectivity Problem and Lack of Proper Infrastructure:** Proper Infrastructure for maintaining and applying AI in rural Assam is very poor. For example- internet connectivity and unreliable power supply in many rural areas are major obstacles to use AI-based tools. *In 2023-24, 53.8% of schools in Assam had internet access, but this figure is higher for schools overall than for rural schools specifically, which face a digital divide. While some recent data suggests as many as 89.71% of government schools in Assam lack internet access, other figures show significant improvement, reaching 45% of schools with electricity and 53.8% with internet by 2023-24. The rural-urban internet gap is approximately 24%, with 69% of urban schools having access compared to 45% in rural areas.*²¹ some remote areas in rural Assam still face issues with unreliable electricity, which hinders the use of digital equipment.

xi) **Lack of Digital literacy:** A major percentage of teachers in rural educational institutions are not digitally skilled to effectively use AI tools and access internet. They are bound to take help from others. This has been hindering the proper implementation of AI tools.

Language Problem: Most AI applications are available in English or Hindi, with limited access to local languages like Assamese. This has caused barrier in the effective use of AI in their respective fields.

xii) **Expensive:** The cost of AI devices and digital platforms are high in respect to access to it, which can be a barrier for underfunded rural educational institutions. AI solutions can be expensive, making them inaccessible for many rural educational institutions.

xiii) **Problem of Digital divide:** A significant gap exists between urban and rural schools in terms of their ability to access and utilize AI technology. Access to AI tools is limited in rural areas due to inadequate infrastructure and internet connectivity. Bridging this divide is critical for equitable AI integration.

xiv) **Lack of trained Teacher:** Educators require training to effectively use AI tools. Without proper support, the technology's potential remains unused and ineffective.

xv) **Problem in Data privacy:** The use of AI entails collecting student data, raising concerns about data security, student records, and other information may be leaked out. This will destroy privacy of data concerned.



- **Solutions to AI challenges in Assam**

Solutions to AI challenges in Assam involve building local AI datasets, fostering local talent through educational initiatives, and creating technology-friendly infrastructure like high-speed internet and cloud services. Other key strategies include developing sector-specific AI applications for agriculture, healthcare, and disaster management, promoting regional collaboration, and establishing a strong legal and ethical framework for AI use.

- i) **Develop local AI datasets:** Create datasets tailored to Assam's specific needs, languages, and culture to improve AI models for regional services.
- ii) **Establish a data center:** Build high-performance computing and AI-ready data centers to power local AI initiatives and research.
- iii) **Improve connectivity:** Subsidize cloud computing and provide high-speed internet access, especially in rural areas, to support startups and tech firms.
- iv) **Foster local talent:** Set up innovation hubs in universities, collaborate with industry leaders, and establish local AI talent marketplaces to connect skilled youth with jobs.
- v) **Promote AI education:** Support AI-centric education from the school level to postgraduate studies.
- vi) **Provide continuous training:** Offer ongoing support to farmers, artisans, and other workers to help them adapt to and utilize AI technologies effectively.
- vii) **Governance and Public Services:** Implement AI for better governance, multilingual, voice-based citizen services, and smart city management.
- viii) **Promote regional collaboration:** Foster economic collaboration with neighboring states to build a stronger technological ecosystem for the entire Northeast region.
- ix) **Encourage local innovation:** Provide grants and support to local innovators and businesses to develop AI-based solutions for regional challenges.

- **Conclusion**

Artificial Intelligence (AI) is redefining the future of education in India, offering ground breaking solutions to bridge learning gaps and enhance teaching methodologies. The most immediate impact of AI in teaching has been in streamlining administrative tasks. AI tools for Indian teachers which automate repetitive tasks like grading assignments, attendance tracking and maintaining student records, allow them more time to engage with students and improve lesson delivery. Lesson planning and curriculum design is also undergoing radical shifts, with teachers utilizing AI to design lesson plans tailored to specific curriculum standards or student needs.



Innovative applications of AI are already making waves, from adaptive learning platforms in edtech to AI-driven multilingual tools that facilitate communication in India's linguistically diverse classrooms. Events like the ISB Insights Forum 2024 further underline the government and industry's commitment to leveraging AI for research and skill development, addressing challenges in both academic and vocational training sectors. As Assam embraces AI to nurture its talent pool, the potential to transform the learning landscape and boost workforce readiness is immense in our daily life style. So, all educationists and academicians must show their eagerness to get familiar with AI tools to boost the education scenario of the state. If we can do this, the rural Assam will be rejuvenated.

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