
ARTIFICIAL INTELLIGENCE IN EDUCATION: CHALLENGES AND FUTURE FOR RURAL STUDENTS

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Abstract :

Artificial Intelligence (AI) is becoming an important part of the education system. AI helps in improving teaching, learning, and student assessment.

This paper focuses on the use of Artificial Intelligence in education with special reference to rural students. AI-based tools such as smart learning apps, online platforms, and virtual classrooms support personalized learning.

However, rural students face many challenges in using AI in education. Lack of internet facilities and digital devices is a major problem in rural areas. Many rural students also have limited digital skills and technical knowledge. Language barriers and lack of trained teachers further increase the difficulties. Due to these challenges, rural students are unable to take full advantage of AI-based education. Despite these problems, AI has great potential to improve rural education.

AI can help in providing quality learning materials to remote areas. It can support self-learning and reduce the gap between rural and urban education. The paper also discusses future directions of AI in rural education. Improved infrastructure and government support are necessary for effective implementation. Training teachers and students is also very important.

The study concludes that AI can play a key role in improving education for rural students. Proper planning and inclusive policies are required to ensure equal educational opportunities.

Keywords : Artificial Intelligence, Education, Rural Students, Digital Divide, Future of Learning

Introduction :

Artificial Intelligence (AI) is a modern technology that helps machines think and learn like humans. AI is widely used in many fields, including education. In modern education, AI helps improve teaching and learning processes. AI-based tools provide personalized learning



according to student needs. It also helps teachers in assessment and classroom management.

Today, digital education is growing rapidly across the world. However, rural education still faces many challenges. Rural students often lack access to quality learning resources. Limited internet facilities and digital devices create barriers in rural areas. AI can help reduce the gap between rural and urban education. It can provide smart learning tools even in remote areas. AI supports self-learning and flexible education for rural students. Therefore, the use of AI in rural education is very important. The purpose of this study is to understand the role of AI in education. The study also focuses on challenges and future opportunities for rural students.

Objectives of the Study :

- a) To study the role of AI in education
- b) To identify challenges faced by rural students
- c) To understand future opportunities of AI in rural education
- d) To suggest measures for effective implementation

Review of literature :

- a) **Arihant Bardia & Aayush Agrawal (2025)** published “*MindCraft: Revolutionizing Education through AI-Powered Personalized Learning and Mentorship for Rural India*” on arXiv. This paper discusses how an AI-based platform called MindCraft can provide personalized learning paths and mentorship specifically for rural students while addressing barriers in traditional education systems.
- b) **Harshita Goyal et al. (2025)** authored “*The Impact of Large Language Models on K-12 Education in Rural India: A Thematic Analysis of Student Volunteer’s Perspectives*” on arXiv. The study explores how AI tools like large language models could support rural classrooms but finds challenges like connectivity, lack of AI training, and digital literacy gaps.
- c) **Pragati Agarwal & Anshita Vij (2025)** published “*Assessing the Challenges and Opportunities of Artificial Intelligence in Indian Education*” in the International Journal for Global Academic & Scientific Research. This mixed-methods study analyzes AI adoption in Indian education, showing challenges such as infrastructure limits and data privacy concerns, especially in under-resourced settings.
- d) **Dr. Rekha A. Pathak & Suresh S. Waghmare (2024)** wrote “*Artificial Intelligence and Secondary Education in India*” in ShodhKosh: Journal of Visual and Performing Arts. The paper highlights AI’s potential to enhance education quality and personalize learning, while also noting implementation challenges relevant to diverse Indian contexts.
- e) **B. Srinivasu Kumar et al. (2025)** in “*Rural Education and Employment Skill Improvement Model Using Artificial Intelligence*” (Journal of Advanced Zoology) propose an AI-powered model to adapt learning paths for rural learners and bridge digital divides through local educator collaboration.
- f) **Ibrahim Siddiq, S. Selvin, D. Shobana, J. Suresh Kumar (2025)** authored “*Challenges and Opportunities of AI Implementation in Education Systems of Rural India*”. It examines



infrastructure, socio-economic and cultural barriers limiting AI use in rural education while outlining potential areas where AI could improve learning outcomes.

Artificial Intelligence in Education :

Artificial Intelligence in education means using smart computer systems to support teaching and learning. AI helps computers understand student needs and provide suitable learning content. AI-based educational tools include smart learning apps, online tutoring systems, and virtual classrooms. These tools help students learn at their own speed. AI also helps teachers by reducing manual work such as grading and attendance. It supports better assessment and feedback for students.

In the teaching process, AI helps in lesson planning and content delivery. In learning, AI supports personalized and self-learning methods. Overall, AI makes education more effective and student-centered.

1) Applications of AI in Education :

AI helps in personalized learning by providing study material according to student needs. Smart classrooms and virtual learning use AI to make online teaching more interactive. AI-based assessment systems automatically evaluate exams and assignments. These systems provide quick and accurate feedback to students. Learning Management Systems (LMS) use AI to manage courses and track student progress. Overall, AI improves the quality and efficiency of education.

2) Challenges of AI in Rural Education :

One major challenge in rural education is the lack of internet and digital infrastructure. Many rural students do not have access to computers, tablets, or smart phones. Limited access to digital devices makes AI-based learning difficult. Digital illiteracy among students and teachers is another serious problem. Many teachers are not trained to use AI tools effectively. Language barriers make it difficult for students to understand digital content. Most AI-based learning materials are available only in English. Economic and social problems also reduce the use of AI in rural education.

3) Ethical and Social Issues :

One important ethical issue is data privacy and security of student information. Student personal data can be misused if not properly protected. Equity and inclusion are major concerns in AI-based education. Not all students get equal access to AI technology. Over-dependence on technology can reduce students' thinking and creativity. Excessive use of AI may also reduce human interaction in learning.

4) Future Directions of AI in Rural Education :

Government initiatives and strong policies can support the use of AI in rural education. AI-based low-cost learning solutions can help poor and remote students. Affordable mobile apps and offline AI tools can be useful in villages. Proper teacher training is needed to use AI



effectively in classrooms. Digital skill development programs can improve teachers' confidence. Community-based digital learning centers can help student's access AI tools. Such efforts can reduce the education gap between rural and urban areas.

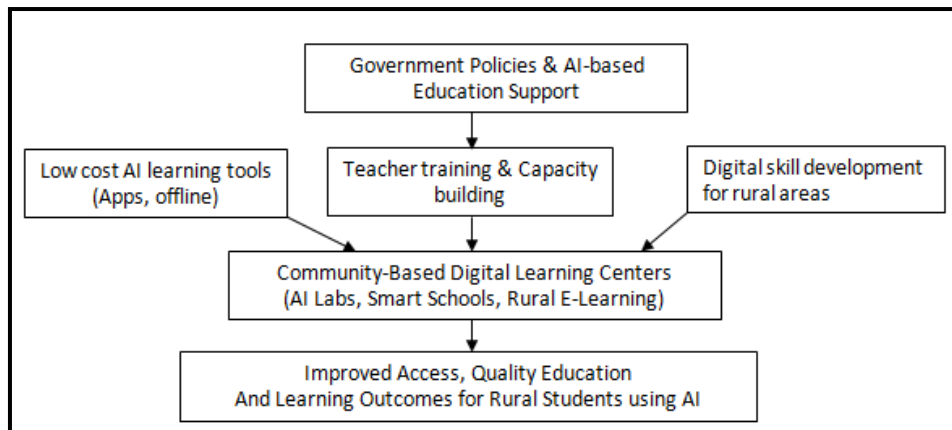


Figure 1: The future directions of AI in Rural Education

5) Research Findings and Discussion :

The study shows that AI helps students understand subjects more easily. AI-based learning tools improve interest and participation among rural students. Personalized learning helps students learn at their own speed. AI reduces the gap between slow and fast learners. Rural students gain better access to quality learning content through AI. Teachers find AI useful for assessment and student progress tracking. Limited internet remains a challenge, but offline AI tools are helpful. Overall, AI has a positive impact on rural learning outcomes.

Conclusion :

This study highlights the growing role of AI in education. AI helps rural student's access quality learning resources easily. It supports personalized learning and improves understanding. Despite challenges, AI has great potential in rural education. Proper training and infrastructure can improve AI usage. Future research should focus on affordable and inclusive AI solutions.

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