



Artificial Intelligence in Multilingual and Inclusive Classroom: Opportunities and Challenges

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ABSTRACT

Multilingualism and inclusion provide educators both benefits and challenges in today's more diversified learning environments. By offering individualized, flexible, and easily accessible learning opportunities, artificial intelligence (AI) is becoming a potent instrument to tackle these issues. The transformative potential of artificial intelligence (AI) in improving learning outcomes in inclusive and multilingual classrooms is examined in this research. The study explores how AI-powered tools, like real-time translation apps, speech recognition software, and adaptive learning platforms, can help students with a range of learning needs and overcome language barriers. It does this by using secondary data from academic journals, policy papers, and case studies. The results show that by taking into account a variety of linguistic origins and learning preferences, AI not only makes education more accessible and personalized but also promotes better equity. However, issues with data privacy, teacher readiness, and equitable access are also brought up by the use of AI technologies. However, the integration of AI technologies also raises concerns about data privacy, teacher preparedness, and equitable access. This research underscores the need for a balanced approach that leverages AI's capabilities while ensuring ethical use and inclusive policy frameworks. The paper concludes with recommendations for educators, policymakers, and technologists to collaboratively design AI-driven solutions that promote



Introduction

Globally, the development of artificial intelligence (AI) is changing educational systems. Students from a variety of language, cultural, and socioeconomic backgrounds attend inclusive, multilingual classrooms. Ensuring that every student learns effectively continues to be a major problem.

Equal participation and learning opportunities for all students, including those with impairments, are encouraged by inclusive education. Multilingual education also promotes cultural identification and cognitive growth (NEP, 2020). By facilitating individualized learning and removing obstacles to communication, AI technologies provide creative answers.

Objectives of the Study

The objectives of this study are:

1. To analyze the role of AI in multilingual and inclusive classrooms.
2. To identify AI-based tools that support diverse learners.
3. To explore opportunities created by AI in education.
4. To examine challenges in AI integration.
5. To suggest practical recommendations.

Methodology

This study is based on secondary data analysis, using:

- Academic journals
- Policy documents such as UNESCO reports
- Books and scholarly articles

A qualitative approach has been used to interpret and synthesize the data .

Conceptual Framework

Artificial Intelligence in Education

Artificial Intelligence (AI) is the term for intelligent systems that can learn, reason, and solve problems. AI makes automation, adaptive learning, and predictive analytics possible in the classroom.



Multilingual Education

Multilingual education involves the use of multiple languages in teaching and learning. It enhances comprehension and inclusion in diverse classrooms (NEP, 2020).

Inclusive Education

Inclusive education ensures equal opportunities for all learners, regardless of abilities or backgrounds.

AI Tools Supporting Multilingual and Inclusive Classrooms

Real-Time Translation Tools

AI-powered tools like translation applications facilitate communication by converting content into multiple languages instantly, reducing language barriers (UNESCO, 2021).

Speech Recognition Software

Speech-to-text tools support learners with hearing impairments and language difficulties, enhancing accessibility (Holmes et al., 2019).

Adaptive Learning Platforms

Adaptive systems personalize learning content based on students' performance and needs.

Assistive Technologies

AI-driven assistive tools, such as text-to-speech and predictive typing, support learners with disabilities .

Chatbots and Virtual Tutors

AI-based chatbots provide immediate feedback and individualized support, improving student engagement .

Opportunities of AI in Multilingual and Inclusive Classrooms

The ability of artificial intelligence to discover problems in children and evaluate their severity at a very early age is one of its main advantages. Artificial intelligence can be used to create new technologies that help children with disabilities communicate and interact socially. AI is capable of producing a virtual world that mimics actual circumstances. Children with impairments can develop interactions and



connections with different social institutions and have a greater understanding of social situations as a result.

Personalized Learning

Teaching at the individual level while taking into account each student's requirements, skills, and learning preferences is known as personalized learning. Teaching in an inclusive classroom can be more effective if it is tailored to each student's unique learning style and pace. When Imamah et al. (2024) evaluated the impact of personalized learning with traditional e-learning, they discovered that students' performance increased by an astounding 71% when using personalized learning, compared to just 54% when using regular e-learning. This gives students the freedom to select their own educational path while keeping their needs in mind. An educational strategy known as "personalized learning" tailors instruction to each student's requirements and preferences (Adeleye, O. O. et al., 2024).

Assistive Technologies and Tools

AI is being used to improve a variety of assistive technologies under inclusive education to make learning more convenient and tailored for students with impairments. One way to think about AI's contribution to social inclusion is as a way to make assistive technology more intelligent. With its assistance, a variety of assistive technology and products can be made more beneficial, useful, and functional. The inclusion of children with impairments in regular classrooms is greatly aided by these AI-based assistive technologies and tools, which include image boards, text-to-speech software for computers, learning programs on touchpads, and speech devices. Language acquisition, peer engagement, and experience sharing are all aided by these tools (Renuka Devi & Sarkar, 2019).

Linguistic Inclusion

Different languages are perceived as a communication obstacle in today's globalized society. There is a great deal of diversity in a multilingual nation like India, where each state and area has its own unique linguistic traits. The Eighth Schedule of the Constitution has twenty-two languages. There are also a lot of regional dialects and languages spoken. A variety of AI tools can be helpful in encouraging linguistic inclusiveness and lowering linguistic conflicts because English has established itself as a worldwide language and for jobs. Natural language processing (NLP), deep learning, and machine learning are some of the technologies used by these products. NLP responds by comprehending different languages and is based on linguistic data.



Students from a variety of linguistic origins and those with hearing impairments may benefit from real-time translation of the source language into a corresponding language via captions in text, video, or audio. Natural machine translation is one of the methods used by programs like Google Translate to assist with language translation. AI helps students integrate many languages and offers a variety of linguistic possibilities in addition to making language learning more individualized and accessible.

Adaptive Assessment

For students to learn meaningfully, receive the right advice in the face of growing competition, and retain their confidence, proper assessment is essential. AI can currently assist with accurate student assessment. According to Manish Mohta (2024), who wrote in the Hindustan Times, integrating AI-powered individualized evaluation techniques has the potential to transform the education system.

There may be differences in learning because students in inclusive education come from a variety of educational, socioeconomic, and IQ backgrounds. Appropriate findings might not be reached if they are evaluated in the same manner. AI assists in determining the learning strengths and shortcomings of students.

Challenges in AI Integration

AI confronts numerous obstacles, despite the fact that it enables children to learn in a unique and creative method, offers specialized instruction for kids with disabilities, and gives access to high-quality education in disadvantaged and restricted places. AI-powered learning becomes quite mechanical. Machines do not provide emotional support to students. In addition to education, children with impairments or from disadvantaged families who do not receive enough socialization require social, emotional, and psychological care. Ahmed Gokhan and Fatih Aydemir (2021) come to the conclusion that education is becoming quite mechanical due to the extensive use of AI. Its use demonstrates a lack of practical perspective in the classroom and raises issues with ethics and security. Students' educational aspects can be developed with AI, while other aspects cannot be created. The goal of education is to foster pupils' creativity and impart intuitive knowledge. However, pupils' inventiveness is declining as a result of their over-reliance on AI. According to a preliminary study on ChatGPT users conducted by Dr. Natalia Kosmina of MIT, excessive ChatGPT use can lower brain function by as much as 55%. It has a big impact on how we perceive things.



AI use impairs memory and decreases brain function. The absence of sufficient AI training for educators is a significant barrier to integrating AI in inclusive education. Teachers have not received any official AI training, and the curriculum for teacher preparation has not been updated.

Key Findings

Several important conclusions on the function of artificial intelligence (AI) in multilingual and inclusive classrooms are revealed by the analysis of secondary data:

Improvement in Learning Accessibility

AI greatly improves accessibility for a variety of learners, which is one of the most notable discoveries. Students with disabilities and language problems can more successfully access instructional information thanks to tools like speech-to-text, text-to-speech, and real-time translation. UNESCO (2021) claims that AI technology, especially for pupils from linguistically varied backgrounds, assist close communication gaps and offer equal learning possibilities.

Personalized Learning Experiences

Adaptive learning systems powered by AI offer personalized instructional materials according to students' skills, interests, and speed. Students who might struggle in conventional, one-size-fits-all classes are supported by this customization. Adaptive training enhances comprehension and lessens cognitive overload, particularly for students with different skill levels.

Support for Multilingual Education

Real-time multilingual communication in classrooms is made possible by AI-powered translation and language processing systems. In addition to learning new languages, this enables pupils to learn in their mother tongue. Mother-tongue education is emphasized in the National Education Policy (2020), and AI helps achieve this objective by making multilingual resources broadly accessible.

Increased Student Engagement

Interactive AI tools such as chatbots, gamified learning platforms, and virtual tutors enhance student engagement. Holmes et al. (2019) note that AI-based systems provide immediate feedback, which motivates students and improves participation in the learning process.

Teacher Support and Efficiency



AI helps teachers with pedagogical and administrative duties like grading, tracking students' progress, and finding learning gaps. As a result, teachers have less work to do and can concentrate more on teaching methods and student engagement (Luckin, 2018).

Discussion

The results demonstrate the revolutionary potential of AI in developing inclusive and fair learning environments. Its application, however, needs to be carefully considered from a variety of angles.

AI as a Tool for Educational Equity

By resolving inequalities brought on by language difficulties and learning disabilities, AI considerably advances educational fairness. AI supports inclusive education by offering accessible and customized learning experiences (Florian, 2014). Regardless of linguistic or cognitive impairments, it guarantees that no learner is left behind.

However, equity is not automatically guaranteed. The benefits of AI are largely dependent on access to technology. Students in underprivileged or rural areas may not have the necessary infrastructure, thereby widening the digital divide (UNESCO, 2021).

Balancing Personalization and Human Interaction

AI makes individualized learning possible, but technology cannot take the place of instructors' social and emotional roles. Education encompasses human contact, empathy, and social growth in addition to knowledge acquisition.

Meaningful teacher-student interactions may be diminished if AI is overused. As a result, rather than taking the position of educators, AI should be utilized as a helpful tool (Luckin, 2018).

Challenges of Multilingual Implementation

AI makes multilingual communication easier, but how well it works relies on how accurate language processing algorithms are. Regional languages and dialects are still difficult for many AI technologies to handle, particularly in linguistically varied nations like India.

This restriction could result in misunderstandings and less successful learning. Thus, the creation of AI systems that are inclusive of all cultures and languages is necessary (NEP, 2020).

Ethical and Privacy Concern



Serious ethical concerns are raised by the use of AI in education, especially with relation to data security and privacy. AI systems gather a lot of student data, including academic and personal data. This data could be abused in the absence of appropriate security measures.

Additionally, students from diverse backgrounds may be treated differently as a result of algorithmic prejudice. In order to guarantee ethical use in education, Baker and Inventado (2014) stress the necessity of transparent and equitable AI systems.

Teacher Preparedness and Professional Development

The lack of teacher preparedness has been noted as another crucial concern. Many teachers lack the necessary training to incorporate AI tools into their lesson plans.

Teachers must have ongoing professional development and digital literacy training in order to integrate AI effectively. According to Holmes et al. (2019), a crucial element in the effective implementation of AI in classrooms is teacher competency.

Conclusion

AI has the ability to transform inclusive and multilingual education by increasing accessibility and personalization. Opportunities abound, but issues like digital inequality, data privacy, and teacher readiness need to be addressed.

AI will effectively support inclusive and equitable educational institutions if it is approached strategically and ethically

References

Adeleye, O. O., Eden, C. A., & Adeniyi, I. S. (2024). Innovative teaching methodologies in the era of artificial Intelligence: A review of inclusive educational practices. *World Journal of Advanced Engineering Technology And Sciences*, 11(2), 069-079. <https://doi.org/10.30574/wjaets.2024.11.2.0091>

Baker, R. S., & Inventado, P. S. (2014). Educational data mining and learning analytics. In *Learning Analytics* (pp. 61–75). Springer.

Florian, L. (2014). What counts as evidence of inclusive education? *European Journal of Special Needs Education*, 29(3), 286–294. <https://doi.org/10.1080/08856257.2014.933551>

Government of India. (2020). National Education Policy 2020. Ministry of Education.



Göçen, Ahmet and Aydemir, Fatih (2020) Artificial Intelligence in Education and Schools. Research on Education and Media. 12(1) 13-21, DOI: 10.2478/rem-2020-0003

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial Intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.

Imamah, Yuhana U. L., Djunaidy A. and Purnomo, M. H. (2024), “Development of Dynamic Personalized Learning Paths Based on Knowledge Preferences and the Ant Colony Algorithm,” IEEE, 12, 144193-144207, , doi: 10.1109/ACCESS.2024.3442312.

Kalyuga, S. (2007). Expertise reversal effect and its implications for learner-tailored instruction. Educational Psychology Review, 19(4), 509–539. <https://doi.org/10.1007/s10648-007-9054-3>

Kumar, S.(2025).“AI and Inclusive Education: Opportunities and Challenges”. International Journal of Scientific Research in Modern Science and Technology (IJSRMST), ISSN: 2583-7605 (Online), 4(9),92-100, Journal URL: <https://ijsrmst.com/> DOI: <https://doi.org/10.59828/ijsrmst.v4i9.375>.

Kosmyna, N. (2025) MIT study links AI chatbot use to reduced brain activity and learning <https://dig.watch/updates/mit-study-links-ai-chatbot-use-to-reduced-brain-activity-and-learning>

Luckin, R. (2018). Machine learning and human intelligence: The future of education for the 21st century. UCL Institute of Education Press.

Mohta, M. (2024) . AI as an aid in educational application processes. Retrieved from <https://www.hindustantimes.com/ht-insight/future-tech/ai-as-an-aid-in-educational-application-processes-101731304043062.html>

Devi, C., & Sarkar, R. (2019). ASSISTIVE TECHNOLOGY FOR EDUCATING PERSONS WITH INTELLECTUAL DISABILITY. European Journal of Special Education Research, 4(3).184-199. Doi:<http://dx.doi.org/10.46827/ejse.v0i0.2487>

UNESCO. (2021). AI and education: Guidance for policy-makers. UNESCO Publishing.