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REDUCING LANGUAGE BARRIERS FOR MULTILINGUAL STUDENTS WITH THE HELP OF ARTIFICIAL INTELLIGENCE TOOLS

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ABSTRACT: Language barriers present a persistent challenge in multilingual classrooms, often hindering students' access to educational content and participation in learning. This study explores the use of Artificial Intelligence (AI) tools to reduce these barriers and enhance learning outcomes for multilingual students in English-medium education. Through a mixed-method approach involving case studies, surveys, and classroom observations across multiple international schools, the research examines the effectiveness of AI-based translation, speech recognition, real-time feedback, and personalized language instruction. The results demonstrate that AI tools can significantly improve communication, comprehension, and academic engagement among multilingual learners. The paper also discusses limitations related to equity, data privacy, and overdependence on technology.

Keywords: Artificial Intelligence, Multilingual Students, Language Barriers, Language Equity, Real-Time Translation, AI Tools in Education, EFL, Inclusive Education

INTRODUCTION

In today's increasingly globalized world, multilingualism in classrooms has become the norm rather than the exception. However, while linguistic diversity can enrich learning environments, it also creates significant barriers to education when instruction is delivered in a language that is not the student's first. English, as a global lingua franca and medium of instruction in many countries, poses particular challenges for learners from diverse linguistic backgrounds.

Language barriers can negatively impact students' academic performance, social integration, classroom participation, and long-term educational attainment. Teachers may struggle to address individual language needs due to limited resources or lack of training in multilingual education strategies. In this context, Artificial Intelligence (AI) tools offer promising solutions to support multilingual learners, enabling more inclusive and accessible education.

This paper investigates how AI-powered technologies—such as real-time translation applications, speech-to-text software, intelligent tutoring systems, and personalized feedback tools—can help reduce language barriers for multilingual students. The cen tral research question is: To what extent can AI tools enhance educational accessibility and equity for learners navigating English as a second or additional language?

METHODOLOGY

A mixed-methods approach was employed to evaluate the impact of AI tools on multilingual students' learning experiences. The study was conducted over six months (January–June 2024) in five international schools across Germany, the UAE, South Korea, Uzbekistan, and Brazil. The sample included:

- 150 multilingual students (ages 13–18) with varying levels of English proficiency.
- 25 English language and subject-matter teachers.
- AI tools implemented: Google Translate, Microsoft Immersive Reader, Grammarly EDU, DeepL, and custom AI learning assistants (e.g., ChatGPT used in education).

Quantitative data were collected through pre- and post-intervention surveys measuring student comprehension, confidence, and engagement in English-medium instruction. Teachers provided weekly feedback logs documenting observed changes in student participation and academic performance.

Qualitative data included semi-structured interviews with students and teachers, along with classroom observations focused on how AI tools were used in real-time to facilitate communication, clarify instructions, and support independent learning.

The study also reviewed the pedagogical literature on AI in language learning, language equity in education, and multilingualism to contextualize the findings.

RESULTS

The implementation of AI tools across the case study sites yielded several key findings:

1. Improved Comprehension and Vocabulary Acquisition. Students using real-time translation tools (e.g., DeepL and Google Translate) demonstrated significantly higher comprehension levels during lessons. On average, comprehension scores increased by 32% over the study period. These tools allowed students to translate difficult instructions and academic vocabulary instantly, which helped them stay on task and understand complex concepts.

2. Increased Student Confidence and Participation. In interviews, 78% of students reported that AI tools gave them the confidence to participate more in class discussions. AI grammar correction tools (like Grammarly) helped students write responses without fear of making errors, while speech recognition applications supported verbal practice in a low-stress environment.

3. Personalized Learning Support. AI-powered chatbots and adaptive language systems were able to offer personalized explanations, vocabulary suggestions, and reading texts aligned with individual students' proficiency levels and interests. Students appreciated being able to ask questions in private and receive tailored feedback—something that was not always possible in teacher-led instruction due to time constraints.

4. Teacher Efficiency and Differentiation. Teachers noted that AI tools enabled more effective differentiation. With multilingual students working at different paces and language levels, AI helped bridge communication gaps. One teacher stated, "I can now focus on higher-order thinking skills with the class, knowing that AI is supporting translation and clarification for those who need it."

5. Challenges and Concerns. Despite these benefits, several concerns emerged. Some students over-relied on translation tools and failed to internalize English expressions. Teachers also expressed concerns about content accuracy and cultural nuances being lost in translation. Data privacy, especially with cloud-based tools, was also a major consideration in schools following strict data protection policies.

DISCUSSION

The findings confirm that AI tools can effectively reduce language barriers for multilingual students, particularly in content comprehension, vocabulary development, and academic participation. These tools support both receptive and productive language skills and function as a digital scaffold for learners who would otherwise struggle to access English-based instruction.

However, it is essential to balance the use of AI tools with pedagogically sound practices. Overdependence on real-time translation, for instance, may prevent students from actively developing English language proficiency. Moreover, AI tools are not perfect—they can misinterpret idiomatic expressions, lack sensitivity to context, and reproduce biases inherent in their training data.

To maximize effectiveness, AI should be integrated as part of a broader inclusive strategy that includes:

- Teacher training on multilingual pedagogy and AI use.

- Development of culturally responsive AI applications.
- Strong data governance and ethical frameworks for AI in education.
- Encouraging gradual autonomy in English without complete reliance on translation.

This aligns with Vygotsky's theory of the Zone of Proximal Development (ZPD), where AI tools serve as scaffolds to support students until they can perform tasks independently. By allowing multilingual learners to access meaning and engage actively in English-medium environments, AI becomes a bridge—not a crutch.

CONCLUSION

AI tools hold great promise in reducing language barriers for multilingual students and promoting equitable learning opportunities in English-medium education. They provide real-time support, customized learning pathways, and enhanced engagement, all of which are critical for linguistic inclusion. However, their use must be accompanied by human oversight, ethical considerations, and strategic integration into curriculum design.

Future research should explore long-term impacts of AI tool usage on English proficiency and academic success, as well as the development of more culturally and linguistically nuanced AI models. In the meantime, educators, policymakers, and developers must collaborate to ensure that AI serves as a tool for empowerment—not replacement—in linguistically diverse classrooms.

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