ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
JALT

CHALLENGES OF AI IN THE CLASSROOM: A CASE STUDY OF ENGLISH LANGUAGE LEARNING FOR STUDENTS IN UNPRIVILEGED AREAS OF PAKISTAN

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Abstract
The introduction of Artificial Intelligence (AI) in education promises to revolutionize teaching and learning, making education more accessible and personalized. However, the implementation of AI in classrooms, especially in underprivileged areas, faces numerous challenges. This paper explores the specific obstacles that students in unprivileged areas of Pakistan encounter when utilizing AI tools for English language learning. By examining issues such as digital divide, infrastructure limitations, lack of teacher training, socio-economic factors, and language barriers, this study provides a comprehensive analysis of how these challenges hinder the effective use of AI in education. The research aims to offer solutions and recommendations to improve the integration of AI technologies in marginalized educational contexts.

Keywords: *Artificial Intelligence, English language learning, unprivileged areas, Pakistan, education, digital divide, socio-economic challenges, technology access.*

1. Introduction

Artificial Intelligence (AI) has transformed various sectors, including education. In the realm of language learning, AI-powered tools such as language learning apps, speech recognition systems, and chatbots have the potential to offer personalized, interactive, and engaging experiences. For countries like Pakistan, where English proficiency is crucial for economic and social mobility, AI could serve as a powerful tool for enhancing language skills, especially in rural or underprivileged regions. However, despite the promising potential, students in these areas face several barriers to effectively utilizing AI for English language learning.

In Pakistan, a significant proportion of the population resides in rural and underprivileged areas where access to resources such as technology, infrastructure, and skilled educators

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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remains limited. This paper investigates the challenges faced by students in these areas when attempting to leverage AI in English language education. We analyze both the technological and socio-cultural factors that contribute to these challenges and discuss possible solutions to overcome them.

1.1.Background

The role of technology in education has been widely acknowledged as a powerful tool for enhancing learning experiences and overcoming barriers to education. In particular, Artificial Intelligence (AI) has gained traction as a transformative force in the classroom. AI can offer personalized learning experiences, enhance engagement, and assist in areas such as language acquisition through intelligent tutoring systems, automated feedback, and speech recognition tools. In the context of language learning, AI applications have shown promise in improving proficiency in English, a language that holds significant importance in Pakistan for academic, professional, and social advancement.

Pakistan is a diverse country with a population of over 240 million people, and while there has been considerable progress in urban areas regarding the adoption of educational technologies, the rural and unprivileged areas face significant barriers to technological integration in education. These areas often struggle with issues such as insufficient infrastructure, lack of access to digital tools, and the absence of trained teachers, making the effective implementation of AI tools a significant challenge. Moreover, AI-driven education tools are often designed for users in urban settings with a high level of technological infrastructure, which exacerbates the gap between rural and urban learners.

The situation is even more pressing in unprivileged areas, where schools may lack basic resources like electricity, let alone the advanced technologies required for AI tools to function. The impact of these challenges on English language learning is particularly stark, as English proficiency is a crucial skill for accessing higher education, securing employment, and participating in the global economy. While the potential for AI to enhance English language education in these areas exists, its integration is hampered by multiple factors that need to be addressed.

1.2. Research Gap

Despite growing interest in AI's potential to revolutionize education, there is a limited body of research focusing specifically on the challenges faced by students in unprivileged areas of Pakistan when using AI for English language learning. The following gaps in the existing literature highlight the need for this study:

Limited Studies in Rural Contexts: Most studies on AI in education tend to focus on urban environments, where technological infrastructure is more readily available. Research that specifically addresses how AI is perceived and utilized in rural and underprivileged areas of Pakistan remains scarce. These areas present unique challenges, such as poor internet connectivity, lack of digital devices, and minimal teacher training, which have not been fully explored in the context of AI-powered English language learning.

Infrastructure and Accessibility Issues: Although there is some literature on the digital divide in Pakistan, little research has been conducted on how this divide affects the adoption and success of AI-driven tools in education. Most existing studies examine technology access in a broad sense but fail to specifically address the unique infrastructural barriers faced by schools in underprivileged areas, especially in terms of AI tool accessibility.

Cultural and Socio-Economic Barriers: There is limited exploration of how socio-economic and cultural factors influence students' and teachers' willingness and ability to adopt AI technologies in language learning. Parental attitudes, the role of community perceptions, and local cultural norms related to technology and education in rural Pakistan remain underexplored in the literature.

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ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
JALT

Teacher Training in AI Integration: While AI implementation has been studied in terms of its technical capabilities and potential outcomes, there is a lack of research focusing on the preparedness of teachers in unprivileged areas to integrate AI into their teaching practices. Specifically, the gap in understanding how teachers can be supported in adopting AI tools in rural classrooms is a key area that remains underexplored.

Localization of AI Content: AI-based language learning tools are often designed with a Western context in mind, which may not align with the linguistic and cultural context of students in Pakistan. Research is needed on the importance of localizing AI content to accommodate regional languages and dialects, as well as how such localization can enhance the efficacy of AI tools for English language learning.

Impact on Language Learning Outcomes: While AI has the potential to enhance language learning, there is insufficient research on its specific impact on English language proficiency in the context of unprivileged areas of Pakistan. Few studies have empirically measured how AI tools influence student outcomes in English language acquisition, particularly in rural schools.

By addressing these gaps, this study seeks to provide a comprehensive understanding of the challenges and opportunities associated with AI-driven English language learning tools in unprivileged areas of Pakistan. Furthermore, it will propose solutions to overcome these challenges and pave the way for more equitable AI integration in education, specifically in marginalized regions.

2. Literature Review

2.1. Artificial Intelligence in Education

AI has been integrated into educational settings in various forms, such as intelligent tutoring systems (ITS), virtual assistants, and automated grading systems (Baker & Siemens, 2014). These technologies are designed to enhance the learning experience by providing personalized content, real-time feedback, and adaptive learning paths. In language learning, AI-powered systems can offer speech recognition, grammar correction, and interactive dialogues, helping students practice in a low-pressure environment.

2.2. Challenges of AI in Education

The integration of AI in education faces significant challenges, particularly in low-income and rural areas. Some of these challenges include:

Digital Divide: Lack of access to technology, such as smartphones, computers, or high-speed internet, is a major barrier for students in unprivileged areas (DiMaggio & Hargittai, 2001). This divide exacerbates the gap between urban and rural education levels.

Infrastructure Limitations: In many rural areas of Pakistan, the lack of stable electricity and inadequate internet connectivity further complicates the use of AI-based learning tools (Warschauer, 2004).

Teacher Training: Teachers in unprivileged areas may lack the necessary training to effectively use AI-based educational tools (Bakia et al., 2012). Without proper professional development, AI tools cannot be used to their full potential.

Socio-Cultural Factors: Cultural norms, socio-economic status, and parental attitudes towards technology and education can affect students' ability to engage with AI tools (Selwyn, 2016).

3. Methodology

This study employs a mixed-methods approach, combining both qualitative and quantitative research methods to gain a comprehensive understanding of the challenges faced by students in unprivileged areas of Pakistan in using AI for English language learning.

3.1. Data Collection

Surveys: A survey was administered to 200 students from various unprivileged areas of Pakistan. The survey consisted of both closed and open-ended questions, focusing on

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
JALT

students' access to technology, their experiences with AI-based learning tools, and the challenges they face in using these technologies.

Interviews: In-depth interviews were conducted with 20 teachers who work in rural areas. These interviews aimed to gain insights into the challenges teachers face when integrating AI tools in classrooms and their perceptions of students' abilities to use such tools.

Focus Groups: Two focus groups were conducted with a total of 15 students and 5 parents from rural areas. The discussions centered around students' and parents' experiences with technology and their perceptions of AI's role in education.

3.2. Data Analysis

The quantitative data collected through surveys were analyzed using statistical tools to identify patterns related to technology access, usage frequency, and perceived effectiveness of AI tools in language learning. Qualitative data from interviews and focus groups were analyzed thematically to identify recurring themes related to infrastructure, teacher training, socio-economic factors, and cultural perceptions of technology.

4. Findings and Discussion

4.1. Digital Divide and Infrastructure Limitations

A major challenge for students in unprivileged areas is the lack of access to technology. The survey revealed that 68% of students do not own a smartphone, and 82% reported that their schools lacked sufficient computers or internet access. Furthermore, 54% of students reported frequent power outages, which hindered their ability to use AI tools effectively. These findings align with previous studies that highlight the digital divide as a significant barrier to AI adoption in education (Burch, 2017).

4.2. Teacher Training and Support

The lack of proper teacher training emerged as another critical challenge. Over 70% of teachers interviewed reported that they had never received any formal training on how to integrate AI into the classroom. Many teachers expressed concerns about their own technological literacy, with some mentioning that they felt overwhelmed by the fast pace of technological advancements. This lack of training not only limits the potential of AI tools but also creates resistance among educators to adopt new teaching methods (Sharma & Singh, 2020).

4.3. Socio-Economic and Cultural Factors

The socio-economic challenges faced by students in rural areas further complicate the adoption of AI in classrooms. Many students come from low-income families where access to the internet or even the basic tools needed for AI-based learning is a luxury. Moreover, cultural attitudes towards education and technology can also play a significant role. The study found that 40% of parents expressed skepticism about the value of AI tools in education, citing concerns about their effectiveness and the fear that technology might replace traditional forms of learning.

4.4. Lack of Localization and Language Barriers

Another significant challenge identified in the study is the lack of localized content in AI learning tools. The majority of AI-powered language learning apps are designed for native English speakers, which often results in poor adaptation for students in Pakistan who are learning English as a second language. Over 50% of students mentioned that the lack of support for local languages (such as Urdu and regional dialects) made it difficult for them to fully comprehend instructions or exercises in AI tools.

5. Solutions and Recommendations

5.1. Improved Infrastructure and Technology Access

To overcome the digital divide, it is essential to increase investment in digital infrastructure in rural areas. This includes providing affordable internet access, distributing low-cost

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
JOURNAL OF APPLIED LINGUISTICS AND TESOL (JALT)
Vol.7.No.4 2024

devices, and ensuring stable electricity. Public-private partnerships can play a crucial role in this process by funding and facilitating these initiatives.

5.2. Teacher Training Programs

Comprehensive teacher training programs on the effective use of AI tools should be implemented. These programs should focus on building teachers' technological literacy, providing hands-on experience with AI tools, and fostering confidence in using AI in the classroom. Online training modules and workshops can be utilized to reach rural teachers more effectively.

5.3. Culturally Relevant and Language-Sensitive AI Tools

AI tools should be designed to be culturally relevant and sensitive to the linguistic needs of students in Pakistan. This includes offering support for local languages, such as Urdu and Punjabi, and ensuring that the content is appropriate for the socio-cultural context of the learners.

5.4. Community Engagement and Awareness

To address the skepticism surrounding AI in education, community awareness programs should be organized. These programs can educate parents and communities about the benefits of AI in language learning and how it can supplement traditional teaching methods rather than replace them.

Conclusion

The challenges faced by students in unprivileged areas of Pakistan in utilizing AI for English language learning are multifaceted and rooted in technological, socio-economic, and cultural factors. Addressing these challenges requires a collaborative approach that includes improving infrastructure, enhancing teacher training, developing culturally appropriate content, and engaging communities. While AI has the potential to significantly enhance language learning, its successful implementation in rural Pakistan depends on overcoming these barriers. By addressing these issues, AI can become an invaluable tool in bridging the educational divide and providing students in underprivileged areas with opportunities to improve their English language skills.

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