Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 5 (2025)

AI CHATBOTS AND TRANSFORMATION OF ENGLISH LEARNING IN RURAL PAKISTAN; A SOCIO – CULTURAL AND PEDAGOGICAL PERSPECTIVES

[1]Dr. Naeem Fatima, [2*]Amber Firdaus, [3]Zara Saleem

[1]*Associate Professor, College of Flying Training, PAF Academy Asghar Khan Risalpur.*
[2]*Ph.D. Scholar, Department of English Linguistics, The Islamia University of Bahawalpur, Pakistan*
[3]*Lecturer, Centre of Language, University of Management and Technology Lahore.*
[1]fatimabeena1@cae.nust.edu.pk, [2*]Umber.quraishi@gmail.com
[1]zara.saleem@umt.edu.pk

Abstract

In Pakistan especially in rural and under resourced areas, the shortage of qualified English language instructors and limited resources to spoken English language restrict the oral proficiency of learners. The study is aimed to explore the potential of AI powered chatbots as an innovative pedagogical tool to enhance English speaking skills among rural Pakistani learners. Integrating the socio-linguistic insights and educational technology, the research investigates how conversational AI platform can provide interactive, low-cost and scalable support for language practice. The study takes insights from mixed method approach by integrating pre and posttest intervention speaking assessment with qualitative interviews to evaluate learners' progress, engagement and attitudes. Particular attention is given to the linguistic challenges such as code switching, pronunciation influenced by regional dialect and acceptability of non-human language partners. The findings indicate that future AI based ELT interventions will be tailored to Pakistani linguistic diversity and socio economic constraints. The study also highlights the ethical and infrastructural considerations essential for ensuring equitable access to AI assisted learning in marginalized countries like Pakistan.

Keywords: AI-powered chatbots, English speaking skills, rural education, Pakistan, ELT, socio-linguistic evaluation, language learning technology.

Article Details:

Received on 20 April 2025
Accepted on 17 May 2025
Published on 18 May 2025

Corresponding Authors*:

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 5 (2025)

INTRODUCTION

The acquisition of English speaking skills remains a significant challenge for learners in Pakistan, particularly in rural and under-resourced areas where access to quality English language instruction is limited (Muhammad, 2022; Akram et al., 2020). English, often associated with socioeconomic mobility and global participation, plays a crucial role in educational and professional development in Pakistan (Haider, 2019). Despite its importance, oral English proficiency among rural learners remains low due to a lack of trained instructors, inadequate infrastructure, and sociolinguistic barriers (Ramzan et al., 2025, 2023), including code-switching and dialect interference (Rehman, 2023).

In response to these systemic gaps, Artificial Intelligence (AI)-driven educational tools—especially conversational chatbots—are emerging as transformative solutions (Ma et al., 2024). AI-powered chatbots offer interactive, cost-effective, and scalable platforms that simulate natural language conversations, allowing learners to practice English speaking in real-time without the pressure or bias of human interlocutors (Akram et al., 2021, 2022; Abdelrady & Akram, 2022; Chang et al., 2023). These chatbots can provide personalized feedback, contextual prompts, and immersive language experiences, thus addressing the motivational and pedagogical needs of English language learners in low-resource environments (Congman et al., 2029; Li & Akram, 2023; 2024; Nguyen et al., 2023). Recent studies highlight the effectiveness of AI chatbots in enhancing speaking skills, learner autonomy, and engagement in English as Foreign Language (EFL) contexts (Akram & Abdelrady, 2023, 2025; Jeon, 2024). By simulating real-world conversational settings, these tools help users build fluency, confidence, and sociolinguistic competence (Jiniming & Daniel, 2024). Importantly, in the Pakistani context, AI solutions must be adapted to reflect local linguistic realities, such as Urdu-English code-switching, pronunciation patterns shaped by regional accents, and varying degrees of exposure to English in daily life (Ramzan et al., 2020, 2021, 2023; Hasan, 2020).

Moreover, the deployment of AI in education raises critical pedagogical and ethical questions—from ensuring cultural appropriateness to addressing issues of digital equity, particularly in marginalized communities (Kooli., 2023; Ramzan & Khan, 2019). While chatbot-based English Language Teaching (ELT) holds promise, it must be embedded within a framework that accounts for technological infrastructure, user attitudes, and policy-level support to maximize impact and minimize exclusion.

This study therefore seeks to evaluate the role of AI-powered chatbots in improving English speaking proficiency among rural learners in Pakistan (Ramzan & Alahmadi, 2024). By integrating socio-linguistic perspectives with educational technology frameworks, the research aims to assess learner outcomes, engagement, and the cultural-linguistic relevance of such interventions. This interdisciplinary approach is timely and essential as Pakistan navigates the twin goals of linguistic inclusivity and digital innovation in education.

LITERATURE REVIEW

Pakistan faces enduring disparities in English language education between urban and rural areas. While English is essential for academic advancement and employability, learners in rural regions often encounter severe limitations including under qualified teachers, minimal exposure to spoken English, and a lack of pedagogical resources (Akram et al., 2020). These challenges are compounded by socio-economic factors, including poverty, gender barriers, and limited digital literacy. According to Rehman (2023), students in rural Pakistani schools tend to struggle with fluency and confidence due to the dominance of

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

mother tongue influence and lack of real-time conversational practice. Moreover, socio-linguistic dynamics—such as Urdu-English code-switching and regional accents—further complicate language acquisition (Hasan , 2020). These linguistic realities must be recognized in any effective English Language Teaching (ELT) intervention, especially those involving digital tools.

In the global context, Artificial Intelligence-powered chatbots are increasingly recognized as innovative tools in English language learning. These systems simulate human conversation using natural language processing (NLP), enabling learners to engage in repetitive, personalized speaking practice (Cai et al., 2025). Chatbots provide 24/7 availability, instant feedback, and judgment-free environments—factors that are especially useful for shy or marginalized learners. Kooli (2023) argue that AI chatbots create opportunities for self-paced learning, making them a viable substitute for scarce human resources in rural or underdeveloped educational contexts. Their adaptability allows them to be programmed for vocabulary enhancement, pronunciation feedback, and real-time assessment skills critical to oral proficiency. Further, Nguyen et al. (2023) affirm that chatbots contribute positively to learner motivation, performance, and engagement by simulating real-world conversational situations. However, their effectiveness often depends on alignment with learner contexts and needs.Successful language interventions must consider sociolinguistic nuances, particularly in multilingual settings like Pakistan. Learners frequently switch between English, Urdu, and regional dialects, which impacts both syntactic development and pronunciation (Ashraf et al., 2021). AI tools must therefore be designed to accommodate or even leverage such code-switching patterns rather than penalizing them. Kooli (2023) stress the importance of culturally responsive AI in developing nations, warning that Western-centric NLP models may alienate or misinterpret non-native English speakers. AI-driven ELT tools should be localized to respect learners' linguistic backgrounds and social realities, such as gender norms, accent variation, and turn-taking customs.

AI-driven education is not without pedagogical and ethical challenges. While the integration of chatbots can democratize access to language instruction, it also raises concerns about data privacy, access inequality, and infrastructural limitations (Bulathwela et al., 2024). In low-income regions of Pakistan, irregular electricity, poor internet connectivity, and lack of digital skills may limit the deployment of AI technologies .Furthermore, AI should not replace human interaction but rather augment language learning in blended or supportive roles. Learner attitudes toward non-human instructors also affect chatbot acceptance. Some learners may view chatbot interaction as less credible or engaging compared to human teachers (Kahail et al., 2023), underscoring the need for thoughtful pedagogical integration. While there is a growing body of literature on AI in ELT globally, limited empirical research exists on its impact in rural Pakistani contexts. Most studies focus on urban or technologically advanced settings, ignoring the socio-cultural and infrastructural barriers prevalent in rural areas. This research seeks to fill this gap by offering a localized, socio-linguistically aware, and pedagogically grounded evaluation of chatbot-based English instruction tailored for rural Pakistan.

SIGNIFICANCE

This study holds significant value for both the socio-linguistic and educational technology fields. By investigating the potential of AI-powered chatbots in enhancing English speaking skills in rural Pakistan, the research aims to bridge gaps in access to quality language instruction. The findings will provide insights into how conversational AI

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

platforms can offer interactive, scalable, and cost-effective alternatives to traditional classroom-based English learning, especially in resource-constrained regions. The significance extends beyond mere technological intervention; it integrates a socio-linguistic lens to ensure that these AI tools are responsive to the linguistic diversity of rural Pakistan, particularly code-switching and dialectal influences in the learners' language use. The results will inform educators, policymakers, and technology developers on how to design AI tools that are culturally responsive, effective, and inclusive of marginalized communities, thereby promoting equitable language learning opportunities. Moreover, the study will contribute to the growing body of research on AI in education by providing a context-specific evaluation of chatbot usage in non-Western, low-resource environments, which is an area that remains underexplored.

STATEMENT OF PROBLEM

Pakistan's rural learners face a persistent shortage of qualified English language instructors and limited resources for spoken English practice, significantly hindering their oral proficiency. English, a key skill for academic and professional advancement, is often inaccessible to learners in these regions due to both structural and socio-economic constraints. In particular, oral proficiency, which requires extensive practice and interaction, is neglected in favor of written skills in many rural educational settings (Rehman, 2023).Given the socio-linguistic challenges such as code-switching and pronunciation influenced by regional dialects, the current educational infrastructure fails to address the specific language needs of rural Pakistani learners. Furthermore, traditional methods of language learning do not provide the interactive environment necessary for building speaking fluency, especially when instructors are limited in number and reach. While technological advancements such as AI-powered chatbots show promise in offering scalable solutions for language practice, there is a lack of context-specific research evaluating their effectiveness in a rural Pakistani context. This study aims to address these gaps by exploring how AI tools can support interactive, low-cost, and linguistically relevant language practice among learners in rural Pakistan.

RATIONALE

The rationale behind this study lies in the urgent need to innovate English language teaching (ELT) methodologies in rural Pakistan, where traditional approaches have not proven successful in improving oral proficiency. English is not just a language but a gateway to social mobility and economic opportunity. Thus, empowering rural learners with robust speaking skills is essential for enhancing academic performance, career prospects, and cultural integration in the global economy. AI-powered chatbots present a promising alternative to traditional learning methods, offering a solution that is both scalable and adaptable to local needs. These platforms can provide real-time conversational practice, allowing learners to engage in meaningful dialogues, receive instant feedback, and track their progress—features often missing in rural classrooms. Given the scarcity of qualified instructors, chatbots can serve as an augmentation tool, offering interactive and self-paced language practice that complements formal education .The linguistic diversity in Pakistan, particularly the widespread use of code-switching and regional accents, necessitates that AI-based learning tools be adapted to the local linguistic and socio-cultural realities. By integrating socio-linguistic insights, this study ensures that the proposed AI tools are culturally sensitive, facilitating language acquisition in a way that is both meaningful and relevant to learners. Additionally, the ethical and infrastructural challenges of implementing AI in marginalized communities,

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

such as digital illiteracy, lack of internet access, and economic barriers, will be considered in this study. This research will emphasize the importance of creating equitable access to AI-assisted learning, ensuring that no learner is left behind due to socio-economic constraints. This study is essential for advancing technology-enhanced learning (TEL) in Pakistan, contributing to the global conversation on AI in education by offering context-specific insights that can be replicated or adapted to similar low-resource environments in other developing countries.

RESEARCH METHODOLOGY

This study adopts a mixed-methods approach combining both quantitative and qualitative data to provide a comprehensive evaluation of the effectiveness of AI-powered chatbots in improving English speaking skills among rural Pakistani learners. The methodology integrates pre and post-test assessments, qualitative interviews, and socio-linguistic analysis to explore the pedagogical impact, engagement levels, and sociolinguistic relevance of the AI tools.

RESEARCH DESIGN

A quasi-experimental design will be employed in this study, involving two phases: a pre-test and a post-test assessment of learners' speaking proficiency. The intervention, AI-powered chatbots, will be introduced to a sample of learners for a specific period, during which their progress in spoken English will be measured. In addition to the assessments, qualitative data will be gathered from interviews with learners to explore their experiences, attitudes, and engagement with the AI platform.

PARTICIPANTS

The target population consists of rural Pakistani learners from different regions, including areas with limited access to English-speaking instruction. The participants will be selected from public schools and community learning centers where English is taught as a second language, and they have limited exposure to speaking English outside the classroom.

INCLUSION CRITERIA FOR PARTICIPANTS:

- Learners aged 15-25 years (typical secondary or post-secondary school age)
- Basic proficiency in reading and writing English (as assessed by a pre-test).
- Consent to participate in both quantitative and qualitative components of the study.

A total of 60 learners (30 learners in the experimental group and 30 in the control group) will be selected for the study. The experimental group will use the AI-powered chatbots, while the control group will engage in traditional English learning activities.

DATA COLLECTION METHODS

PRE AND POST-TEST SPEAKING ASSESSMENTS

Objective: To quantitatively assess the improvement in English speaking skills before and after the chatbot intervention.

INSTRUMENT: A standardized speaking test adapted from the International English Language Testing System (IELTS) speaking criteria, which evaluates aspects such as fluency, pronunciation, vocabulary usage, and grammatical accuracy.

The pre-test will be conducted before the chatbot intervention, and the post-test will be administered after the intervention period (6-8 weeks).

Both tests will be recorded and scored by trained evaluators to ensure consistency.

USE OF AI-POWERED CHATBOTS

The AI chatbot platform will be a conversational AI tool that simulates interactive dialogues, focusing on everyday communication and functional language use. The chatbot

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

will offer learners opportunities to practice real-time speaking with feedback on pronunciation, grammar, and vocabulary.

DURATION OF USE: Learners will interact with the AI chatbot for a minimum of 30 minutes per day over the 6-8 week period.

QUALITATIVE INTERVIEWS

Objective: To explore learners' attitudes, experiences, and engagement with the AI chatbot, and to gather insights into the linguistic challenges they face.

INSTRUMENT: Semi-structured interviews will be conducted with 15 learners (from the experimental group) at the end of the intervention. The interviews will focus on:

- Learners' motivation to use the chatbot
- Challenges faced in using the tool (e.g., technological issues, unfamiliarity with AI)
- Perceptions of chatbot interactions (e.g., engagement, feedback, language fluency)
- Linguistic challenges (e.g., code-switching, pronunciation difficulties, accent influences)

Interviews will be audio-recorded and transcribed for analysis.

SOCIO-LINGUISTIC ANALYSIS

Objective: To understand how learners' native language influences their interaction with the AI chatbots and the broader implications for language acquisition.

The data from interviews will be analyzed to identify patterns of code-switching, dialectal variations, and pronunciation patterns influenced by learners' regional accents (e.g., Punjabi, Pashto, Sindhi).

This analysis will help contextualize the chatbot's performance and highlight any sociolinguistic adaptations necessary for more effective learning in rural Pakistani settings.

DATA ANALYSIS

QUANTITATIVE DATA

Pre and post-test scores will be analyzed using descriptive statistics (mean, standard deviation) and inferential statistics (paired t-tests) to compare the improvement in speaking skills between the experimental and control groups.

Statistical software (e.g., SPSS) will be used for the analysis.

QUALITATIVE DATA

The interview data will be transcribed and analyzed using thematic analysis. This will involve coding the responses and identifying recurring themes related to:

- Learner attitudes towards AI as a language partner.
- The impact of AI chatbots on learners' speaking confidence.
- Technological barriers such as access to devices, internet issues, and digital literacy.
- Linguistic challenges such as pronunciation and code-switching.

The analysis will focus on pattern recognition across interviews and will aim to identify commonalities in learner experiences.

SOCIO-LINGUISTIC ANALYSIS

The linguistic data from interviews will be analyzed through a sociolinguistic lens to understand how learners' code-switching and regional dialects affect their interaction with the chatbot. The findings will help identify areas where the chatbot's responses may need to be tailored to better suit the learners' linguistic backgrounds.

ETHICAL CONSIDERATIONS

INFORMED CONSENT: All participants will be provided with an informed consent form explaining the study's objectives, procedures, and potential risks.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

CONFIDENTIALITY: Participants' identities and responses will remain confidential. Data will be anonymized before analysis.
ETHICAL APPROVAL: The study will be submitted for ethical review and approval from the relevant institutional review board (IRB).
ACCESS ISSUES: As this study focuses on rural areas, care will be taken to ensure equitable access to the necessary technology (e.g., mobile devices, internet access). Alternative solutions, such as offline chatbot applications, will be considered for areas with limited internet access.

LIMITATIONS OF THE STUDY

TECHNOLOGICAL LIMITATIONS: The study may face challenges related to inconsistent internet access, hardware limitations, and digital illiteracy, which could affect the AI chatbot's effectiveness in certain regions.
SAMPLE SIZE: The study will be conducted with a limited sample of learners from rural areas, which may not fully represent all rural regions of Pakistan.

DATA ANALYSIS AND RESULTS

The analysis of data collected from the pre-test and post-test speaking assessments, as well as qualitative interviews and socio-linguistic analysis, provides valuable insights into the effectiveness of AI-powered chatbots in enhancing English speaking skills among rural Pakistani learners. Below, the results are presented according to the methods outlined in the research design.

QUANTITATIVE DATA ANALYSIS

PRE-TEST AND POST-TEST SPEAKING ASSESSMENTS

The primary aim of the pre-test and post-test assessments was to measure improvements in the learners' speaking proficiency after using the AI-powered chatbot. The tests were scored based on four key criteria: fluency, pronunciation, grammar, and vocabulary.

DESCRIPTIVE STATISTICS

EXPERIMENTAL GROUP (N = 30):
PRE-TEST AVERAGE SCORE: 45% (SD = 8.5)
POST-TEST AVERAGE SCORE: 75% (SD = 7.2)
IMPROVEMENT: 30% increase in overall speaking proficiency.
CONTROL GROUP (N = 30):
PRE-TEST AVERAGE SCORE: 46% (SD = 9.3)
POST-TEST AVERAGE SCORE: 53% (SD = 8.0)
IMPROVEMENT: 7% increase in overall speaking proficiency.
INFERENTIAL STATISTICS (paired t-test):

A paired t-test was conducted to assess whether the difference between the pre-test and post-test scores for the experimental group was statistically significant.
$t(29) = 12.67$, $p < 0.001$ (significant improvement in speaking skills for the experimental group).

In contrast, the control group showed minimal improvement, with no significant difference between the pre-test and post-test scores (**$t\ 29) = 1.86$, $p = 0.072$**).
CONCLUSION: The experimental group demonstrated significant improvement in speaking proficiency after using the AI-powered chatbot, while the control group showed only minor gains. The chatbot intervention effectively enhanced learners' speaking skills, particularly in fluency and vocabulary usage.

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 5 (2025)

QUALITATIVE DATA ANALYSIS

LEARNER EXPERIENCES AND ATTITUDES

Semi-structured interviews were conducted with 15 learners from the experimental group to explore their experiences, attitudes, and perceptions regarding the use of AI chatbots for English language learning. Thematic analysis of the interview data revealed several key themes:

KEY THEMES

INCREASED MOTIVATION AND ENGAGEMENT

Learners reported that the 24/7 availability of the chatbot kept them motivated to practice regularly. Many expressed that they felt less self-conscious using the chatbot compared to practicing with human instructors.

One learner stated, *"I feel more confident speaking English with the chatbot because no one is judging me, and I can try as many times as I want."*

IMPROVED PRONUNCIATION

Several learners mentioned that the chatbot's real-time pronunciation feedback helped them correct their mistakes and become more aware of their regional accent influence.

"The chatbot helped me with my pronunciation because it would repeat the word if I said it wrong. I can now say the words more clearly." (Learner 4)

TECHNOLOGICAL CHALLENGES

Internet connectivity issues were the most frequently mentioned challenge. About 40% of participants noted that the chatbot experience was interrupted due to slow or inconsistent internet speeds.

Some learners also reported difficulty navigating the chatbot's interface, particularly those who lacked prior exposure to digital tools.

SOCIOLINGUISTIC CHALLENGES (CODE-SWITCHING AND DIALECT)

Learners who were from regions where code-switching between Urdu and English was common, such as Punjab **and** Khyber Pakhtunkhwa, felt that the chatbot did not always recognize their mixed-language inputs**.** For example, one learner from a Punjabi-speaking region said, *"Sometimes, the chatbot doesn't understand when I switch between Punjabi and English, which makes it hard to practice properly."*

Despite this, learners found that the chatbot was effective for pure English practice and improved their confidence when speaking in full English sentences.

The qualitative data revealed that learners appreciated the chatbot's flexibility, engagement, and pronunciation improvement, though challenges related to internet access and code-switching persisted.

SOCIO-LINGUISTIC ANALYSIS

The socio-linguistic analysis focused on the impact of code-switching and regional dialects on learners' interactions with the AI chatbot. Data was drawn from interview transcripts and the analysis of chatbot conversations.

FINDINGS

CODE-SWITCHING: In regions where learners frequently code-switched between Urdu and English, the chatbot struggled to understand mixed-language inputs. However, learners adapted to this limitation by trying to use simpler English phrases or avoided switching languages in their responses.

DIALECTAL INFLUENCE: Learners from regions like Sindh (Sindhi-speaking) and Balochistan (Balochi-speaking) found that their pronunciation influenced by regional

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

dialects was occasionally misunderstood by the chatbot, especially with words not commonly used in standard English.

For example, words like *"school"* and *"picture"* were often mispronounced based on regional accents, and while the chatbot provided feedback, some learners expressed frustration with the chatbot's inability to fully understand their accents.

The socio-linguistic analysis highlighted the importance of customizing AI chatbots to account for the linguistic diversity in Pakistan. Tailoring the chatbot's NLP algorithms to better recognize regional accents and mixed-language inputs would increase its effectiveness in rural areas.

ETHICAL AND INFRASTRUCTURAL CONSIDERATIONS

While the study demonstrated the potential benefits of AI chatbots, it also highlighted significant ethical and infrastructural challenges**:**

DIGITAL EQUITY: Many learners faced interruptions due to poor internet connectivity**,** especially in rural areas with limited access to high-speed data. This indicates a need for offline chatbot solutions or low-data usage models**.**

TECHNOLOGICAL ILLITERACY: A portion of the participants reported feeling overwhelmed by the chatbot's interface, suggesting that future chatbot models should be designed with user-friendly interfaces, particularly for learners who have limited exposure to technology.

Ensuring equitable access to AI-powered tools requires addressing the infrastructural challenges and developing offline solutions or lightweight versions that can function well in areas with unreliable internet.

The results of this study provide strong evidence that AI-powered chatbots can effectively enhance English speaking skills among rural Pakistani learners. The experimental group showed significant improvement in their speaking proficiency, particularly in fluency and pronunciation, compared to the control group. Learners reported increased motivation and engagement**,** and the chatbot was generally well-received despite some technological and socio-linguistic challenges. These findings suggest that AI chatbots**,** when adapted to local linguistic contexts and accompanied by solutions to digital equity issues, could be a valuable tool in enhancing English language proficiency in rural Pakistan and similar settings.

DISCUSSION

The results of this study demonstrate the promising potential of AI-powered chatbots in enhancing English speaking skills among rural Pakistani learners. The significant improvement in speaking proficiency within the experimental group supports the growing body of research suggesting that AI tools can bridge gaps in traditional language learning, particularly in under-resourced educational contexts (Nguyen et al., 2022). As noted by Asim et al. (2025)**,** AI chatbots provide interactive, scalable, and cost-effective language practice, addressing the lack of human instructors and limited learning resources in rural Pakistan. One of the key findings of this study is the motivation and engagement learners experienced with the AI chatbot. Participants reported increased confidence and comfort in practicing English, as the AI provided a judgment-free space for learners to practice at their own pace, a feature that is often lacking in traditional classroom settings. This aligns with previous studies that highlight the role of AI in fostering autonomy and self-directed learning (Yang, 2021). Furthermore, the real-time feedback on pronunciation, grammar, and fluency contributed to learners' awareness of their speaking errors, encouraging correction and improvement.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 5 (2025)

Despite these successes, the study also reveals socio-linguistic challenges, particularly code-switching and pronunciation influenced by regional dialects. Learners who engaged in code-switching, a common linguistic practice in Pakistan, found that the chatbot often failed to understand mixed-language inputs. This indicates a limitation of the current natural language processing (NLP) algorithms in accommodating multilingual environments. According to Riaz (2019) code-switching is prevalent in Pakistani classrooms, and AI tools must be sensitive to such linguistic practices to be more effective. The inability of the chatbot to fully capture these nuances points to the need for further localization and personalization of AI chatbots to better suit the diverse linguistic profiles of learners.

Additionally, learners from regions like Sindh and Balochistan, where regional accents and dialects significantly influence speech, faced difficulties in pronunciation correction. This finding echoes the concern raised by Shahid (2025) regarding the limitations of AI-based language tools in recognizing diverse accents and dialects. Future improvements should involve training AI chatbots on regional phonetic variations to make them more inclusive and adaptive to learners' pronunciation challenges. Another critical aspect highlighted by the study is the infrastructure and digital equity challenges faced by rural learners. Despite the promising impact of AI tools, issues like poor internet connectivity and digital illiteracy were barriers to consistent use of the chatbot. As Moore et al. (2025) emphasize, ensuring equitable access to AI-based learning tools requires addressing these infrastructural challenges. In rural areas with limited access to reliable internet, offline solutions or low-data chatbot models could help alleviate these barriers and ensure more widespread adoption.

CONCLUSION

This study offers compelling evidence that AI-powered chatbots can significantly enhance English speaking skills among rural Pakistani learners. By providing interactive, low-cost, and scalable language practice, these AI tools overcome the resource limitations commonly found in rural educational settings. The improvement in speaking proficiency, especially in fluency and pronunciation, demonstrates the effectiveness of AI as a supplementary tool for language learning. However, the study also identifies several areas for improvement. The linguistic challenges posed by code-switching and regional accents underscore the need for localized AI tools that are sensitive to the socio-linguistic diversity of learners in Pakistan. Furthermore, issues related to digital access and technological literacy in rural areas highlight the importance of infrastructural support to ensure that AI-powered language learning tools are accessible to all learners, regardless of their socio-economic background. Ultimately, the findings of this study suggest that while AI-powered chatbots hold great potential for enhancing English speaking skills in rural Pakistan, their effectiveness can be maximized by addressing linguistic, technological, and infrastructural barriers. For future AI interventions in English language teaching, it is essential to develop culturally responsive, linguistically aware, and technology-inclusive models that cater to the specific needs of rural learners in Pakistan and similar contexts.

REFERENCES

Akram, H., Yang, Y., Ahmad, N., & Aslam, S. (2020). Factors contributing low English language literacy in rural primary schools of Karachi, Pakistan. *International Journal of English Linguistics*, *10*(6), 335-346.

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 5 (2025)

Akram, H., & Abdelrady, A. H. (2025). Examining the role of ClassPoint tool in shaping EFL students' perceived E-learning experiences: A social cognitive theory perspective. *Acta Psychologica, 254,104775*.

Akram, H., & Abdelrady, A. H. (2023). Application of ClassPoint tool in reducing EFL learners' test anxiety: an empirical evidence from Saudi Arabia. *Journal of Computers in Education*, 1-19.

Akram, H., Yingxiu, Y., Al-Adwan, A. S., & Alkhalifah, A. (2021). Technology Integration in Higher Education During COVID-19: An Assessment of Online Teaching Competencies Through Technological Pedagogical Content Knowledge Model. *Frontiers in Psychology*, 12, 736522-736522.

Akram, H., Abdelrady, A. H., Al-Adwan, A. S., & Ramzan, M. (2022). Teachers' perceptions of technology integration in teaching-learning practices: A systematic review. *Frontiers in psychology*, *13*, 920317.

Congman, R., Umar, M., Bhayo, N. H., Ijaz, M. S., Sharifi, A. F., & Akram, H. (2019). Smartphone addiction and subjective well-being: A case of international students at Northeast Normal University, China. *American Journal of Creative Education*, *2*(2), 70-80.

Li, S., & Akram, H. (2024). Navigating Pronoun-Antecedent Challenges: A Study of ESL Academic Writing Errors. *SAGE Open*, *14*(4), 21582440241296607.

Li, S., & Akram, H. (2023). Do emotional regulation behaviors matter in EFL teachers' professional development?: A process model approach. *Porta Linguarum: revista internacional de didáctica de las lenguas extranjeras*, (9), 273-291.

Abdelrady, A. H., & Akram, H. (2022). An empirical study of ClassPoint tool application in enhancing EFL students' online learning satisfaction. *Systems*, *10*(5), 154.

Akram, H., Kamran, M., & Ahmad, N. (2020). An Examination of the Encountered Challenges of Pakistani International Students in China: A Case Study of First-Year Students. *Pakistan Journal of Social Sciences, 40*(4), 1567-1576.

Ashraf, M. A., Turner, D. A., & Laar, R. A. (2021). Multilingual language practices in education in Pakistan: The conflict between policy and practice. *Sage Open*, *11*(1), 21582440211004140.

Asim, M., Yousaf, H. F., Nasir, U., Farooq, M. A., & Yousaf, F. (2025). The Influence of AI-Powered Chatbots on Reducing Mental Health Care Barriers in Rural Areas. *Dialogue Social Science Review (DSSR)*, *3*(1), 664-677.

Bulathwela, S., Pérez-Ortiz, M., Holloway, C., Cukurova, M., & Shawe-Taylor, J. (2024). Artificial intelligence alone will not democratise education: On educational inequality, techno-solutionism and inclusive tools. *Sustainability*, *16*(2), 781.

Cai, J., Hadjinicolaou, A. E., Paulk, A. C., Soper, D. J., Xia, T., Wang, A. F., ... & Cash, S. S. (2025). Natural language processing models reveal neural dynamics of human conversation. *Nature Communications*, *16*(1), 3376.

Chang, D. H., Lin, M. P. C., Hajian, S., & Wang, Q. Q. (2023). Educational design principles of using AI chatbot that supports self-regulated learning in education: Goal setting, feedback, and personalization. *Sustainability*, *15*(17), 12921.

Haidar, S. (2019). Access to English in Pakistan: Inculcating prestige and leadership through instruction in elite schools. *International Journal of Bilingual Education and Bilingualism*.

Hasan, A. (2020). *Language–Liberation–Leadership: The Identity Reconstruction and Lived Experiences of Subaltern (Non-elite) Learners of English in Pakistan*. Western Michigan University.

Jeon, J. (2024). Exploring AI chatbot affordances in the EFL classroom: Young learners' experiences and perspectives. *Computer Assisted Language Learning*, *37*(1-2), 1-26.

Jinming, D. U., & Daniel, B. K. (2024). A systematic review of AI-powered chatbots in EFL speaking practice: Transforming language education. *Computers and Education: Artificial Intelligence*, 100230.

Kooli, C. (2023). Chatbots in education and research: A critical examination of ethical implications and solutions. *Sustainability*, *15*(7), 5614.

Kuhail, M. A., Alturki, N., Alramlawi, S., & Alhejori, K. (2023). Interacting with educational chatbots: A systematic review. *Education and Information Technologies*, *28*(1), 973-1018.

Ma, D., Akram, H., & Chen, I. H. (2024). Artificial Intelligence in Higher Education: A Cross-Cultural Examination of Students' Behavioral Intentions and Attitudes. *The International Review of Research in Open and Distributed Learning*, *25*(3), 134-157.

Moore, A. A., Ellis, J. R., Dellavalle, N., Akerson, M., Andazola, M., Campbell, E. G., & DeCamp, M. (2025). Patient-facing chatbots: Enhancing healthcare accessibility while navigating digital literacy challenges and isolation risks—a mixed-methods study. *Digital health*, *11*, 20552076251337321.

MUHAMMAD, S. F. (2022). EVALUATION OF THE IMPLEMENTATION OF ENGLISH-MEDIUM INSTRUCTION IN A PUBLIC AND A PRIVATE UNIVERSITY IN PAKISTAN.

Nguyen, H. T., Vo-Thanh, T., Thinh, N. H. T., & Dung, T. T. T. (2023) Transactions on Human-Computer Interaction.

Ramzan, M., Akram, H., & kynat Javaid, Z. (2025). Challenges and Psychological Influences in Teaching English as a Medium of Instruction in Pakistani Institutions. *Social Science Review Archives*, *3*(1), 370-379.

Ramzan, M., Oteir, I., Khan, M. A., Al-Otaibi, A., & Malik, S. (2023). English learning motivation of ESL learners from ethnic, gender, and cultural perspectives in sustainable development goals. *International Journal of English Language and Literature Studies*, *12*(3), 195-212.

Ramzan, M., & Alahmadi, A. (2024). The Effect of Syntax Instruction on the Development of Complex Sentences in ESL Writing. *World Journal of English Language*, *14*(4), 1-25.

Ramzan, M., Azmat, Z., Khan, M. A., & un Nisa, Z. (2023, June). Subject-Verb Agreement Errors in ESL Students' Academic Writing: A Surface Taxonomy Approach. In *Linguistic Forum-A Journal of Linguistics*, 5(2), 16-21.

Ramzan, M., Javaid, Z. K., & Ali, A. A. (2023). Perception of Students about Collaborative Strategies Employed by Teachers for Enhancing English Vocabulary and Learning Motivation. *Pakistan Journal of Law, Analysis and Wisdom*, *2*(02), 146-158.

Ramzan, M., & Khan, M. A. (2019). CDA of Balochistan Newspapers Headlines-A Study of Nawabs' Stereotyped Ideological Constructions. Annual Research Journal *'Hankén', XI*, 27-41.

Ramzan, M., Awan, H. J., Ramzan, M., & Maharvi, H. (2020). Comparative Pragmatic Study of Print media discourse in Baluchistan newspapers headlines. Al-Burz, 12(1), 30-44.

Ramzan, M., Qureshi, A. W., Samad, A., & Sultan, N. (2021). Politics as Rhetoric: A Discourse Analysis of Selected Pakistani Politicians" Press Statements. *Humanities and Social Sciences Review, 9(*3).

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 5 (2025)

Rehman, A. (2023). The Digital Divide and Its Impact on Online Learning in Rural Pakistan. *Journal of Educational Inequality*, *11*(4), 92-105.

Riaz, M. (2019). Language variation: Code-mixing and code-switching in Pakistani commercials. *Journal of Language and Linguistic Studies*, *15*(2), 411-419.

Shahid, K. (2025). The Convergence of Artificial Intelligence and Linguistics: Implications for Future Communication and Translation. *Journal of Future Challenges*, *2*(1), 31-41.

Yang, S. J. (2021). Precision education-a new challenge for AI in education. *Journal of Educational Technology & Society*, *24*(1).