Harnessing Artificial Intelligence in English Language Learning: An Analysis of Pashtoon Learners' Perspectives

Muhammad Saleem	PhD Scholar, Department of English, Air University Islamabad, Pakistan.
Dr. Irfan Ullah	Assistant Professor, Department of English, Abdul Wali Khan University Mardan, Khyber Pakhtunkhwa, Pakistan.
Nosheen Farwah Iqbal	MPhil Scholar (Linguistics), Department of English, Abdul Wali Khan University Mardan, Khyber Pakhtunkhwa, Pakistan.

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Corresponding Author:
Muhammad Saleem
Email: saleemsafi5@gmail.com

Abstract: *This study explores the role and reception of Artificial Intelligence (AI) tools in English language learning among Pashtoon students studying in Government Higher Secondary Schools in District Mardan, Pakistan. Despite the growing global integration of AI in education through tools, there remains a significant gap in access and utilization among marginalized student populations in rural Pakistan. Using a qualitative design, data were collected through semi-structured interviews with 400 1st and 2nd year students. Thematic analysis revealed four major findings: widespread unawareness of AI tools, reliance on traditional teacher-centered methods, multiple socio-economic and technological barriers to access, and conditional willingness to engage with AI if proper support is provided. The results highlight a digital divide, further complicated by gender disparities, infrastructural deficits, and lack of teacher training. However, students' expressed interest in AI tools, when introduced properly, presents an opportunity for inclusive and transformative educational reforms. This study addresses a critical research gap and calls for targeted policy measures to integrate AI-driven learning in underserved regions of Pakistan.*

Introduction

English has emerged as the global lingua franca, serving as a crucial medium for communication, education, diplomacy, and access to knowledge in an increasingly interconnected world (Crystal, 2003). Proficiency in English is widely considered a gateway to academic achievement, economic opportunities, and upward social mobility, particularly in multilingual and postcolonial contexts such as Pakistan (Rahman, 2002). In Pakistan, English functions as an official language and holds a dominant position in higher education, civil services, and corporate sectors (Mahboob, 2009). Yet, the reach and quality of English language education remain uneven, especially in linguistically and culturally distinct regions like Khyber Pakhtunkhwa and Baluchistan, where Pashtoon communities predominantly reside.

Pashtoon students face several interlinked challenges in acquiring English language proficiency. These include inadequate school infrastructure, a shortage of qualified English teachers, and limited availability of English learning materials (Rahman, 2005). The exclusion of education is further enhanced by socio-economic limitation, gender inequality, and the pastiamo of conflict in certain regions (UNESCO, 2021). Moreover, digital divide in these areas is quite prominent, and a significant number of students have no connection to the internet, smartphones, and computer literacy knowledge, which are becoming key aspects of language learning nowadays (Malik et al., 2021). Consequently, students in these communities have been failing regularly to keep pace with their counterparts in acquisition of the English language, hence, shrinking their educational and career opportunities.

There has been a proposal of Artificial Intelligence (AI) in education that is promising towards solving some of these challenges. Given that all the major AI-powered language learning tools, including ChatGPT, Duolingo, Grammarly, and Google Translate, offer interactive, flexible, and personalized learning options, they are reshaping the world of language learning since they provide learners with equal opportunities (Zawacki-Richter et al., 2019). Such tools may provide instant feedback and allow learning according to personal styles, as well as be asynchronous, which is especially important in distant and underserved locations (Chen et al., 2020). Artificial intelligence tools can act as a translator into high quality English language learning, in places where the traditional classroom instruction is deficient or non-existent, to the Pashtoon students.

With wide, enthusiastic interest in AI in education, it is easy to find a gap in empirical studies on the implementation of AI in education on the population of South Asia, especially Pashtoon Nation. Research mostly involves urban, technologically equipped or socioeconomically advantageous learners without paying attention to the cultural and infrastructural background of the underrepresented groups (Awais et al., 2022). Such a gap is challenged in this research by the exploration of Pashtoon students' engagement with AI tools to learn the English language, the obstacles in front of them, and what can be done to better localize such technologies to facilitate their educational growth.

Research Objective

- To understand the application of an artificial intelligence (AI) tool by the Pashtoon learners to assist them in English language acquisition in the adverse set of educational resources as well as the digital landscape.

Research Question

- What is the role of the AI-based tools used by Pashtoon students to improve learning the English language?

Literature Review

Artificial Intelligence (AI) application in teaching language can be supported by numerous theories, namely, the socio-cultural theory introduced by Vygotsky who contributed to the importance of tool development and social involvement in cognitive development (Vygotsky, 1978). Intelligent systems with AI capabilities like ChatGPT or Duolingo fill the mediational tool role, moderating language development by scaffolding the learner through interaction, feedback and context-dependent provision, doing the job previously conducted by human teachers. Also, there is a Computer-Assisted Language Learning (CALL) model which promotes the use of digital technologies which facilitates, enriches language learning powering interactivity, personalization, and autonomy of the learner (Beatty, 2010). These theories provide a good justification of exploring AI application in enhancing English proficiencies among students especially within under-resourced environments.

The world sees the growing potential of AI technologies in second languages acquisition and adoption because it is an effective solution providing an immediate response, learning by adapting, and the possibility of being available 24/7 (Zawacki-Richter et al., 2019). Grammarly helps with writing accuracy, duolingo gives a vocabulary-learning game, and ChatGPT provides an opportunity to practice conversation in real time and receive the explanation of grammar rules and the vocabulary. Studies have shown that AI-supported language learning enhances learner motivation, engagement, and performance, especially in asynchronous and remote contexts (Chen et al., 2020; Wang & Vásquez, 2012).

However, most of these studies are situated in technologically advanced or urban educational environments. Little attention is given to rural or socioeconomically disadvantaged populations where infrastructural and digital constraints affect the practical utility of such tools (Hwang & Fu, 2019).

In the Pakistani context, English holds an elite status and is associated with power, education, and social mobility (Rahman, 2002). While urban areas have begun experimenting with AI-assisted learning, rural and tribal areas still face significant challenges such as a lack of internet connectivity, digital illiteracy, and limited teacher capacity (Malik et al., 2021). Awais et al. (2022) report that although digital tools are expanding in urban schools, their integration remains sporadic and largely unsupported in rural contexts due to systemic inequalities and resource limitations.

Furthermore, while the Higher Education Commission (HEC) of Pakistan promotes digitization and English proficiency, it has yet to formulate policies that support localized AI integration in language classrooms (Ali & Shah, 2020). Existing research in Pakistan focuses more on general ICT usage in education and less on specific applications of AI in language learning, particularly in culturally distinct and underserved communities such as the Pashtoon population.

Pashtoon students, mostly residing in Khyber Pakhtunkhwa, Balochistan, and tribal areas, are among the most educationally marginalized in Pakistan due to poverty, conflict, and underinvestment in infrastructure (UNESCO, 2021). Girls, in particular, face additional socio-cultural barriers to education (Ahmad & Sultana, 2017). The lack of exposure to spoken and written English, combined with weak pedagogical frameworks and an acute digital divide, creates an environment where conventional English instruction often fails to deliver meaningful outcomes (Rahman, 2005).

Despite these challenges, there is growing interest among Pashtoon youth in using smartphones and accessing online platforms, even if informally, to learn English. This presents an opportunity for AI tools to serve as alternative or supplementary resources for language development. However, the effectiveness, accessibility, and cultural relevance of such tools in this specific socio-cultural and educational context remain unexplored in the academic literature.

Research on AI application in learning the English language is extensive in the context of world and some urban Pakistani students, but there is sharp shortage of such studies to support and justify usage of AIs on students of Pashtoon descent. The current literature has failed to address this point concerning the interaction of language training, access to technology and culture in deprived areas. There has not been any study of considerable weight on how Pashtoon learners gain, access, and perceive AI tools and, how and to what extent they can be customized to fit linguistic and contextual needs. This paper therefore seeks to fill this gap by investigating on the lived experiences of Pashtoon students who are using AI tools to learn English language as a way of informing more inclusive and equitable educational policies and practices.

Methodology

This research uses a pragmatist paradigm, which places emphasis on a practical solution to real-world issues, as well as makes methodology flexible (Creswell & Poth, 2018). Pragmatism suits the research on the interaction of a high number of students with the tools of AI in a definite educational and socio-cultural environment.

The research employs qualitative exploratory research the use of which has a descriptive quantitative component. Such cross orientation enables a deep examination of experiences and views of students, as well as finding the scope of usage trends. It is all about determining how AI has been incorporated in the learning of the English language among the Pashtoon students under Government Higher Secondary Schools.

A purposive sampling technique was used to select students who met the following criteria:

- Currently enrolled in 1st and 2nd year at Government Higher Secondary Schools
- Self-identified as Pashtoon
- Familiar with or have used AI tools

The sample consists of 400 students from multiple schools across District Mardan, ensuring a wide demographic spread in terms of gender, school location (urban/rural), and academic performance.

Data Collection

Data was collected through structured and semi-structured interviews. Students were interviewed either individually or in small focus groups, depending on the setting and logistical feasibility. The interview protocol focused on:

- Familiarity and frequency of AI tool usage
- Perceived usefulness for English learning
- Challenges related to access, comprehension, and cultural fit
- Preferences for tool improvement or local relevance

Each interview lasted approximately 15–25 minutes. Interviews were conducted in Pashto or Urdu (depending on the student's preference) and translated into English for analysis.

Data Analysis

Interview transcripts were analyzed thematically following Braun and Clarke's (2006**)** six-step process:

1. Familiarization with the data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the final report

Given the large sample size, coding was partially automated using Excel-based matrix categorization, and cross-checked manually to ensure consistency.

The study adhered to ethical research practices. All participants were informed of the study's purpose, voluntary participation, and data confidentiality. Informed written consent was obtained from all students, and parental consent was secured for participants under 18 years of age. All data was anonymized and securely stored.

Limitations

- Although the sample size is large, findings are contextually bound to Government Higher Secondary Schools in District Mardan.
- Interviews relied on self-reported usage of AI tools, which may be subject to recall bias.
- The study does not include teacher or administrative perspectives, which could offer additional insights into AI integration.

Data Analysis

Thematic analysis was conducted on interview responses from 400 1st and 2nd year students enrolled in Government Higher Secondary Schools in District Mardan. Following Braun and Clarke's (2006) six-phase framework, this analysis aimed to explore students' awareness, use, challenges, and attitudes toward AI tools for English language learning.

Transcripts were reviewed, coded, and categorized using manual coding and Excel matrixing. From this analysis, ten key themes emerged, reflecting the students' lived realities. Illustrative quotations are included to represent participants' perspectives, and theme prevalence is based on observed frequency in coded responses.

Theme 1: Lack of Awareness of AI Tools (~75%)

Most students had never heard of AI-powered tools. For many, the idea of using mobile apps or AI for language learning was completely unfamiliar.

> *"Sir, what is ChatGPT? Is it a game or something?"* (Student A)
>
> *"I use WhatsApp but not for learning English. I didn't know apps can help."* (Student B)

These points to a fundamental digital knowledge gap, not a rejection of AI tools.

Theme 2: Minimal Integration in Classroom Practice (~90%)

Students consistently reported that teachers do not introduce or use AI tools in their English classes. Learning remains strictly limited to textbooks, grammar translation, and lecture-based methods.

"Our teacher just writes notes and tells us to memorize them. No mobile, no internet." (Student C)

"In our school, no one talks about apps for learning. It's all books and chalk." (Student D)

This shows the absence of AI in formal teaching, limiting exposure and experimentation.

Theme 3: Technological and Economic Barriers (~70%)

Even those who had mobile phones cited lack of regular internet**,** poor device quality, and financial constraints as major obstacles to accessing AI tools.

"I have a basic mobile, and I can't install apps like those. Storage is full." (Student E)

"My father gives me credit once a week. I can't waste it on apps I don't understand." (Student F)

This reflects a material digital divide, not just an awareness issue.

Theme 4: Reliance on Conventional Learning Methods (~80%)

Learning practices remained rooted in rote memorization, translation, and teacher dictation. Students often equated "real learning" with textbook-based preparation for exams.

"We learn essays by heart and write them in exams. That's how we pass." (Student G)

"Our sir says, don't waste time on mobile. Read your grammar book." (Student H)

This hinders autonomous learning and reinforces passive dependence on outdated methods.

Theme 5: Disconnect Between Policy and Practice (~60%)

Despite national policy commitments to "Digital Pakistan" and "Smart Classrooms," students found no evidence of digital transformation in their schools.

"They show digital education on TV, but our lab is always locked." (Student I)

"There is no multimedia, no internet. Only chalk and duster." (Student J)

This highlights a policy-implementation gap, particularly in rural Pashtoon regions.

Theme 6: Fear and Confusion around AI and English Apps (~45%)

Some students expressed anxiety or confusion when interacting with AI interfaces, especially in English.

"It speaks in English. I don't understand what it says, so I close it." (Student K)

"What if I press something wrong and it sends my data?" (Student L)

This fear stems from low digital and language confidence, not unwillingness to learn.

Theme 7: Dependency on Teachers for Learning Direction (~85%)

Students reported a heavy reliance on teachers to guide, approve, or allow any learning method. Independent learning via digital tools was rare.

"We only follow what our teacher says. We don't try anything else." (Student O)

"Sir never asked us to search online. He gives us notes to prepare." (Student P)

This dependency restricts learner autonomy—a critical factor in AI tool usage.

Theme 8: Misconceptions about Technology and Education (~30%)

Some students believed that digital tools were harmful, distracting, or unhelpful for real learning.

"Apps are for entertainment. Study is only with books." (Student Q)

"My cousin failed because he kept using his phone all day." (Student R)

Such beliefs are influenced by family narratives and peer perceptions, rather than direct experience.

Theme 9: Desire for AI Exposure and Training (~35%)

Despite barriers, a significant number of students showed interest and willingness to learn if they were properly guided.

"If someone trains us, I want to try grammar apps." (Student S)

"We need a class where they show us how to use these tools." (Student T)

This points to potential for meaningful adoption if structured digital literacy programs are introduced.

This comprehensive thematic analysis reveals that lack of access, awareness, digital literacy, and institutional support remain the key barriers to the integration of AI tools in English language learning for Pashtoon students in government schools. However, student curiosity and willingness provide a hopeful path for future digital inclusion initiatives.

Discussion

This study investigated the role and reception of AI tools in English language learning among Pashtoon students in Government Higher Secondary Schools of District Mardan. Thematic analysis of interview data from 400 students revealed critical barriers to AI integration and deepened understanding of student perceptions. The discussion here situates these themes within broader national and international research.

The data revealed that the majority of students had no knowledge or experience with AI tools. This reflects the continued exclusion of rural and ethnic minority learners from digital learning transformations in Pakistan (Malik et al., 2021; Awais et al., 2022). Indeed, as the government endorses smart classrooms and e-learning policies, there is a gap between government policy vision and policy implementation as evident in the lack of infrastructure, training, and access to public schools in Mardan (Ali & Shah, 2020).

The belief of students in teacher-centered instruction which is based on a book justifies the point that nothing has changed with regard to pedagogical practices in these schools. The absence of digital literacy among teachers may further hinder the introduction of innovative tools (Rahman, 2005). Teachers are gatekeepers of change, and without their participation in digital transformation, learners remain anchored to traditional rote learning models.

Economic challenges, lack of stable internet, and shared or outdated devices all contributed to the technological gap observed in this study. Female students faced additional sociocultural restrictions on mobile phone usage, pointing to a gendered digital divide (Ahmad & Sultana, 2017). These results align with UNESCO (2023) findings that rural and marginalized students often face multiple forms of digital exclusion, not just in device access but also in digital confidence and training.

Fear, confusion, and even suspicion about AI tools were evident in many interviews. Some students believed these tools could be dangerous or distracting, mirroring community-level concerns about the misuse of technology. This reinforces the idea that digital literacy must also address cultural attitudes, not just skills training.

Encouragingly, a portion of students expressed interest in learning through AI tools—if proper guidance and support were available. This willingness shows that attitudes can be shifted through awareness programs, inclusive training, and supportive policies tailored for disadvantaged regions. As Lee (2021) argues, AI's educational benefits are only realized when users are empowered to interact meaningfully with the technology.

This study responds to the lack of empirical research on AI-based language learning in the context of ethnic, socioeconomically challenged students in Pakistan—particularly Pashtoon students in public-sector institutions. While much of the AI-education literature focuses on urban, tech-literate environments, this study presents ground-level insights into underserved learners' realities, filling a key gap in national and international discourse.

Findings

The analysis of interviews with 400 1st and 2nd year Pashtoon students from Government Higher Secondary Schools in District Mardan revealed four major findings regarding their relationship with AI tools in English language learning. These findings reflect not only technological and educational barriers but also sociocultural dynamics and latent potential.

A dominant finding was that the majority of students had never heard of or used AI tools. Many expressed surprise or confusion when these tools were mentioned during the interview. This point is a complete lack of exposure, both at home and in school environments. Students frequently noted that they used their mobile phones only for basic activities such as making calls or using WhatsApp or TikTok.

"Sir, I've never used anything like that. What is Grammarly? I only use my phone for music and messages." (Student A)

This lack of awareness is not due to unwillingness but to structural neglect. These tools were never introduced in their formal education, nor were they promoted by teachers, peers, or school leadership. The digital revolution in education—globally prominent—remains invisible to most of these learners.

Students across all sampled schools emphasized that their English language instruction was based on rote memorization, textbook translation, and teacher dictation. Digital learning methods, multimedia resources, or AI-based learning aids were completely absent from their classrooms. The entire learning process depended on note-taking and repetition, often driven by exam preparation rather than meaningful language acquisition.

"Our English teacher reads from the book, explains grammar rules, and we memorize essays. That's how we learn." (Student B)

This finding highlights a wider pedagogical problem: teachers themselves are not equipped or encouraged to adopt modern teaching tools. As a result, students remain locked into rigid learning models that offer no opportunity for creative, interactive, or autonomous engagement, which AI tools are designed to foster.

Even among students who showed interest in exploring AI tools, technological, economic, and social barriers made such exploration nearly impossible. Many students did not own smartphones or had limited access to shared family devices. Lack of internet connectivity, unreliable electricity, and the high cost of mobile data were frequently cited issues.

Moreover, even students who had devices often lacked the confidence or digital literacy to try unfamiliar apps. Some feared making mistakes, while others avoided English-language apps altogether because they couldn't understand the interface.

"The app was in English, and I didn't know what to click. I just deleted it." (Student D)

This finding illustrates how the digital divide is not merely about device ownership—it is also about confidence, language barriers, digital skills, and social support**.**

While most students had never used AI tools, a minority showed interest and motivation when the concept was explained to them. Some students asked whether they could use AI to improve their writing or pronunciation. They expressed curiosity and willingness—but also clear dependence on guidance.

"If someone teaches us how to use these apps, I want to learn. Maybe it can help in grammar." (Student E)

This shows that the problem is not one of resistance, but of lack of direction. Students are not reluctant to embrace AI, but they are just not given an opportunity. The school system was the source of awareness in few cases where the awareness existed at all, either through personal tuitions or elder siblings or through YouTube Channels.

The result indicates a potential opportunity: students in underrepresented areas such as Mardan can use the benefits of AI with appropriate teacher training, awareness-raising, and support on the school level. Interest in language improvement is already present; and there once was just a lack of the connecting point between interest and access.

Conclusion

In this research, I tried to examine the use of Artificial Intelligence (AI) in English language acquisition in

Government Higher Secondary Schools of District Mardan of Pakistan amongst the Pashtoon students. Based on the interviews of 400 1st and 2nd year students, the study uncovered the confusing narratives amidst unawareness, systemic non-inclusion, and socio-economic limitations, which simultaneously determine how and whether the students can access and use AI-based learning tools.

It was demonstrated that most of the AI tools could be used extensively to facilitate the process of learning the English language, yet it is absent to a high degree in the experiences of the examined students. The learning is traditional, teacher-centered, and exam-centered, and therefore there is no chance to innovate and discover something new using the modern technology. Not only are students ignorant of the existence of AI tools, but they are also left socially, economically and educationally behind the digital change, which is taking place in other areas.

Not least of all, the results unveiled the willingness and eager curiosity of part of the students to embrace the use of AI-based approaches, provided they were equipped with adequate assistance, training, and facilities. This is an alarm call that educational stakeholders should fill the digital divide, especially in deprived areas such as Khyber Pakhtunkhwa, by initiating context-sensitive programs in digitally training and even integrating AI.

Conclusively, the study points out that incorporation of AI into language learning among Pashtoon students is never a technological concern, rather, a multidimensional compounding of pedagogy, policy, access, and empowerment. It is noted that the findings may be of great help in understanding how a neglected group of the Pakistani younger generation can be further integrated into the global digital learning trend already as long as effective, inclusive, and locally focused approaches are designed.

Recommendations

To close the digital divide, there is a need to conduct training of the English language educators of the schools operating in the public-sector regarding their capability to make good use of AI instruments to teach students in classrooms. The training process must comprise practical workshops, continuous online assistance, and curriculum integration in such a way that AI will not be an added feature or an add-on to the processes that are already used in teaching but an additional feature instead. Teachers, who are confident in the application of such tools, will have more chances of using those with students, rather than state-only approach because students will feel more engaged.

Education departments and policymakers should devise and use digital literacy curriculum that will suit the need of the rural students especially in areas such as District Mardan. Such programs must offer basic information on how to use mobile apps and AI in learning English and may be made available in both foreign and local languages (Pashto/Urdu). The priorities should be given to mobile-based, low-bandwidth tools.

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