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CHALLENGES AND OPPORTUNITIES OF MULTILINGUAL AI TOOLS USE FOR UNIVERSITY STUDENTS OF RURAL COMMUNITIES IN KPK PAKISTAN

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Abstract
This study explores the challenges and opportunities of using multilingual AI tools, such as ChatGPT, among university students from rural communities in Khyber Pakhtunkhwa (KPK), Pakistan. While higher education in the region increasingly requires proficiency in multiple languages—primarily English, Urdu, and Pashto—students from rural backgrounds often face linguistic, technological, and infrastructural barriers that hinder their academic performance. Using a qualitative research design, this study draws on semi-structured interviews and focus group discussions with university students from rural areas of KPK. The findings highlight both the potential benefits and the limitations of multilingual AI integration in higher education. On the one hand, students reported that ChatGPT's multilingual features enhanced their comprehension of academic materials, supported translation across English, Urdu, and Pashto, and offered personalized assistance in writing and research. On the other hand, issues such as limited internet connectivity, lack of digital literacy, mistrust of AI-generated content, and insufficient representation of local dialects posed significant challenges. The study concludes that while multilingual AI tools hold promise in reducing educational inequalities, their successful adoption in rural KPK requires context-sensitive strategies, including improved infrastructure, training for digital literacy, and the incorporation of regional languages into AI systems. This research contributes to ongoing debates on the role of artificial intelligence in inclusive and equitable higher education in multilingual societies.
Key words: *Challenges, Opportunities, Multilingualism, Rural Community, Students.*

Introduction

Multilingualism is use of more than one language in communication and learning is a characteristic feature of Pakistan (Ahmad et al., 2022; Amjad et al., 2021), and particularly of Khyber Pakhtunkhwa (KPK), where students often navigate among Pashto, Urdu, English, and sometimes regional dialects in their daily lives and education (Ramzan et al., 2023a, 2023b, 2023c). In higher education settings, proficiency in English is frequently a prerequisite for reading academic texts, participating in lectures, completing assignments, and engaging in research (Li & Akram, 2023, 2024), while Urdu and local languages/languages of instruction play substantial roles in comprehension and cultural identity (Nisa et al.,2023).

Recently, Artificial Intelligence (AI) tools such as ChatGPT have shown promise in supporting language learning and multilingual educational practices (Ma et al., 2024). These tools can offer personalized feedback, translation assistance, opportunities for interactive language practice, and

scaffolding for students in their second or third languages (Hussain et al.,, 2024). However, the adoption of such technologies among university students in rural communities faces unique challenges (Akram et al., 2020, 2021a, 2022). These include issues of technological infrastructure (e.g., unreliable internet, power outages), limited digital literacy among both students and instructors, socio-economic constraints, language-specific issues such as dialectal variation and code-switching, and potentially limited relevance or cultural alignment of AI tools to local linguistic contexts (Hussain et al., 2024; Mustafa, 2024).

Despite these challenges, there are various opportunities and multilingual AI tools may help to reduce inequities in access to high quality language instruction, allow students to work at their own pace (Akram & Li, 2024), support translation and comprehension, and bolster confidence in academic writing and speaking in non-native languages. In rural KPK, where many students come from backgrounds with limited exposure to English and where educational resources may be stretched thin, such tools might serve as supplementary resources to traditional instruction, helping to bridge gaps in access and outcomes. Therefore, this study aims to explore the challenges and opportunities associated with the use of multilingual AI tools such as ChatGPT among university students in rural KPK.

Literature Review

Pakistan's higher education landscape is inherently multilingual, with English (as the main academic language), Urdu (national lingua franca), and regional languages such as Pashto shaping classroom practices, identity, and access (Ashraf, 2021; Ashraf, 2022; Ramzan & Alahmadi, 2024). Studies highlight how public discourse and policy pressures sustain English's prestige while reconfiguring the value of local languages, influencing student trajectories and equity in learning (Ashraf, 2022; Nawaz et al., 2021, 2022). In Khyber Pakhtunkhwa (KPK), everyday linguistic practices encompass code-switching and hybrid literacies, and recent work mapping linguistic landscapes underscores the coexistence of English, Urdu, and Pashto scripts in public signage—an indicator of the region's complex sociolinguistic ecology that students bring with them to university (Chen, & Ramzan, 2024; Mahmood, 2023). These dynamics suggest that any educational technology—especially AI tools must engage multilingual realities rather than assume monolingual English usage.

Systematic reviews and meta-analyses report mixed but generally positive effects of AI and generative tools (including ChatGPT) on aspects such as learning performance, self-regulated learning, and perceived usefulness, while also documenting concerns about accuracy, overreliance, and academic integrity (Wang et al., 2024). Large-scale and cross-context studies describe both benefits (feedback, scaffolding, idea generation) and risks (hallucinations, superficiality), indicating that institutional context, task design, and student literacy shape outcomes (Lee et al., 2024). For Pakistan specifically, emerging empirical studies find growing student interest and reported performance benefits, but also highlight variability in digital readiness and ethical guidance—issues that are likely magnified for rural KPK students .

For multilingual learners, AI-mediated language support (e.g., translation, terminology clarification, genre modeling) can scaffold access to English-medium materials while respecting local linguistic repertoires (Akram et al., 2021b). Evidence from AI-supported language instruction shows gains in achievement and motivation when tools are integrated pedagogically and paired with strategy training (Akram & Abdelrady, 2023; Wei et al., 2023). In principle, ChatGPT's multilingual capacities could help rural KPK students bridge gaps in vocabulary,

discourse conventions, and academic writing across English, Urdu, and Pashto, provided the prompts, feedback, and evaluation are contextually adapted. These opportunities align with broader findings that AI's benefits are strongest when embedded in structured tasks and teacher mediation rather than used as a generic substitute for learning activities (Wang et al., 2024; Lee et al., 2024).

A persistent digital divide in the region—connectivity, device access, cost, and digital literacy—constrains the equitable uptake of AI tools; research on higher education faculty and institutions shows that disparities in access and skills can undermine technology's promised benefits (Abdelrady & Akram, 2022; Soomro et al., 2020). For ChatGPT-style tools, additional challenges include the uneven quality of outputs in under-represented languages and varieties (e.g., Pashto dialects), risks of misinformation or hallucinations, and concerns about academic integrity and overreliance (Lee et al., 2024). Recent higher-education studies also document ambivalent student motivations and downstream effects on learning quality, calling for clear policies, literacy programs, and assessment redesign (Abbas et al., 2024; Al-Adwan et al., 2022; Aslam et al., 2021). Within Pakistan's multilingual ecology, tensions between English's market value and local language identities further complicate AI adoption: students may experience gains in access but also pressures to conform to English-dominant norms (Ashraf, 2022).

The literature offers robust global syntheses and initial Pakistan-focused surveys, yet there is limited qualitative work that centers rural KPK university students' lived experiences across English–Urdu–Pashto, especially regarding how infrastructural constraints, dialectal coverage, and academic integrity policies intersect in everyday study practices. Your qualitative design (interviews, focus groups) directly addresses this gap by foregrounding student sense-making, local multilingual repertoires, and context-sensitive conditions for productive AI use.

Research Methodology

Research Design

This study adopts a qualitative research design to explore the challenges and opportunities of using multilingual AI tools, such as ChatGPT, among university students from rural communities in Khyber Pakhtunkhwa (KPK), Pakistan.Through qualitative data semi-structured interviews and focus group discussions the research shed light on how rural students perceive these tools, what barriers they encounter, and under what conditions the tools can contribute meaningfully to their language learning and academic development. A qualitative approach is appropriate because it emphasizes participants' lived experiences, meaning-making processes, and contextual factors that shape the use of educational technology (Creswell & Poth, 2018). The thematic analysis is chosen as the analytic method because it provides a systematic yet flexible framework for identifying, analyzing, and reporting patterns within qualitative data (Braun & Clarke, 2006).

Participants

The participants are undergraduate students enrolled in universities located in districts of Mardan KPK. A purposive sampling strategy is employed to recruit approximately 25 students who have prior exposure to ChatGPT or similar AI tools for academic purposes. Diversity in gender, field of study, and linguistic background (e.g., Pashto, Urdu, Hindko) is considered to capture a range of perspectives.

Data Collection

Data is collected through semi-structured interviews and focus group discussions (FGDs). Interviews enable an in-depth exploration of individual experiences, while FGDs encourage

collective reflection and reveal shared as well as contrasting views among peers. Each interview and focus group last between 45–60 minutes and is conducted in the participants' preferred language (Pashto, Urdu, or English). With participants' consent, all sessions are audio-recorded and transcribed verbatim.

Data Analysis: Thematic Analysis

Thematic analysis follows Braun and Clarke's (2006) six-step process:

1. **Familiarization with the data** – Transcripts will be read multiple times to develop an overall understanding.
2. **Generating initial codes** – Meaningful units of data related to challenges and opportunities of multilingual AI use will be coded systematically.
3. **Searching for themes** – Codes will be grouped into potential themes reflecting key patterns (e.g., "digital divide," "academic support," "language barriers").
4. **Reviewing themes** – Themes will be refined and cross-checked against the dataset to ensure coherence.
5. **Defining and naming themes** – Each theme will be clearly defined, capturing both surface and latent meanings.
6. **Producing the report** – The final analysis will integrate data extracts with analytic commentary to present a coherent narrative addressing the research questions.Manual coding is used to assist in data management and theme development.

Trustworthiness

To enhance the trustworthiness of the study, the following strategies are adopted:

- **Credibility**: Member checking is conducted by sharing preliminary findings with participants for validation.
- **Transferability**: Thick description of the research context and participants are provided.
- **Dependability and Confirmability**: An audit trail documenting coding decisions and reflexive notes are maintained (Lincoln & Guba, 1985).

Ethical Considerations

Ethical approval is sought from the relevant university review board. Participants are informed about the purpose of the study, their right to withdraw at any time, and confidentiality measures. Pseudonyms are used in transcripts and reports to protect identities.

Data Analysis and Findings

Thematic analysis of interviews and focus group discussions with university students from rural Khyber Pakhtunkhwa (KPK) revealed four overarching themes and several sub-themes. These themes reflect both the opportunities and challenges of multilingual AI tools, such as ChatGPT, in academic life.

1: Digital Divide and Accessibility

1.1: Limited Internet Connectivity

Students repeatedly emphasized unreliable or slow internet connections, particularly in rural areas. Many reported interruptions during attempts to access ChatGPT, which reduced its utility for assignments and exam preparation.

"Whenever I try to use ChatGPT in the hostel, the internet drops, and I just leave it. It feels useless sometimes." (Participant 4)

1.2: Financial Constraints

Affordability of devices and internet packages was another barrier. Some students indicated that they relied on shared mobile devices or limited internet bundles.

"I cannot buy extra data packages just to use ChatGPT, so I use it only when Wi-Fi is available at the university." (Participant 9)

2: Language and Multilingual Support

2.1: English Comprehension Support

Most participants noted that ChatGPT helped them better understand English texts by providing explanations in simpler English or translating into Urdu and Pashto. This made academic content more accessible.

"When I read an article in English, I don't understand everything. ChatGPT explains in easy words or even in Urdu, which helps a lot." (Participant 11)

2.2: Lack of Regional Language Representation

While Urdu and English support was beneficial, students expressed dissatisfaction with the limited representation of Pashto and Hindko. Some found translations inaccurate or culturally irrelevant.

"ChatGPT doesn't always understand Pashto words. The meaning is lost, so it is not fully reliable for us." (Participant 2)

3: Academic Opportunities and Skill Development

3.1: Writing and Assignment Assistance

Students described ChatGPT as a valuable tool for drafting essays, paraphrasing, and improving grammar in English. Many reported increased confidence in producing academic texts.

"I use ChatGPT to correct my grammar in English assignments. It makes my writing look more professional." (Participant 6)

3.2: Self-Paced Learning

The tool was appreciated as a "24/7 tutor" that allowed independent learning and practice outside the classroom.

"Teachers are not always available, but ChatGPT gives answers any time. I practice English conversation with it." (Participant 15)

4: Trust, Ethics, and Academic Integrity

4.1: Mistrust of Accuracy

Some participants expressed doubts about the accuracy of ChatGPT responses, citing instances of irrelevant or factually incorrect content.

"I cannot trust ChatGPT completely because sometimes it gives wrong references or wrong information." (Participant 7)

4.2: Concerns About Overreliance

While many found ChatGPT helpful, they admitted the risk of dependency, which could hinder critical thinking and originality.

"If we just copy-paste, then we are not learning. ChatGPT should be used for guidance, not for all the work." (Participant 13)

Ethical Awareness and Plagiarism

A few students mentioned uncertainty about whether using ChatGPT constituted plagiarism, revealing a gap in institutional guidance.

"I don't know if my teacher allows ChatGPT. We are confused about its legal use." (Participant 18)

Synthesis of Findings

The analysis suggests that multilingual AI tools present significant opportunities for rural KPK university students, particularly in overcoming English language barriers, improving academic writing, and fostering independent learning. However, these opportunities are mediated by structural and contextual challenges**,** including digital inequities, limited representation of local languages, and ethical concerns surrounding academic integrity.This duality highlights the need for context-sensitive policies**,** such as improving rural internet access, expanding AI language datasets to include Pashto and Hindko, and creating clear institutional guidelines for ethical AI use.

Discussion

The findings of this study highlight the dual nature of multilingual AI tools like ChatGPT for university students in rural Khyber Pakhtunkhwa (KPK). While students reported significant academic opportunities such as enhanced comprehension, writing support, and self-paced learning—these were tempered by structural challenges including the digital divide, linguistic representation, and ethical uncertainty. The results suggest that ChatGPT provides meaningful support in navigating the multilingual demands of higher education. Students' use of ChatGPT to simplify English texts or translate into Urdu aligns with previous research demonstrating the role of AI-powered tools in scaffolding second-language learning and improving academic performance (Wei et al., 2023). This finding is particularly relevant in multilingual contexts like Pakistan, where English is the dominant academic medium but not the first language for most students (Ashraf, 2022). The lack of robust Pashto or Hindko support, however, reflects broader concerns about the underrepresentation of local languages in AI training data.

The challenge of limited internet access and financial constraints resonates with prior work on digital inequity in higher education. Soomro et al. (2020) noted that gaps in infrastructure and digital literacy disproportionately affect students from rural or underprivileged regions, limiting the equitable adoption of technology. In KPK, such structural barriers hinder students from consistently accessing ChatGPT, which may exacerbate existing educational inequalities instead of mitigating them. Participants expressed concerns about the reliability of ChatGPT responses and the risk of overreliance. Similar skepticism has been reported globally, where students acknowledged the tool's usefulness but questioned its factual accuracy and ethical use (Lee et al., 2024). The uncertainty around plagiarism and institutional guidelines in this study mirrors findings from Abbas et al. (2024), who highlighted a lack of clarity in higher education policies regarding generative AI. Without explicit guidance, students may struggle to balance the benefits of AI support with academic integrity requirements.

Taken together, these findings illustrate that multilingual AI tools hold potential to reduce language-related barriers and empower rural students, but only if contextual barriers are addressed. This supports calls for context-sensitive integration strategies, including infrastructural investments, digital literacy training, and policies that acknowledge the role of local languages in education (Ashraf et al., 2021; Wang et al., 2024). Moreover, there is a need for clear institutional frameworks that regulate AI use in ways that safeguard academic integrity while enabling innovation. This study contributes to the growing literature on AI in education by foregrounding the lived experiences of rural multilingual students. The results show that ChatGPT is not a neutral tool; rather, its benefits and risks are mediated by linguistic, cultural, and infrastructural realities.

Addressing these issues is essential if AI is to serve as a tool of equity rather than exclusion in multilingual higher education contexts such as KPK.

Conclusion

This study explored the challenges and opportunities of using multilingual AI tools, such as ChatGPT, among university students from rural communities in Khyber Pakhtunkhwa (KPK), Pakistan. Through qualitative data analysis, four key themes emerged: digital divide and accessibility**,** language and multilingual support**,** academic opportunities and skill development**,** and trust, ethics, and academic integrity. These themes reflect the nuanced reality that while multilingual AI tools have the potential to enhance academic engagement and success, their effectiveness in rural KPK is significantly influenced by infrastructure**,** digital literacy**,** and contextual language needs**.**

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