ISSN E: 3006-1466
ISSN P: 3006-1458
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
CJSSR
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
Vol.03 No.03 (2025)

INTEGRATION OF AI IN ENGLISH LEARNING: A CASE STUDY OF PEOPLE'S UNIVERSITY OF MEDICAL AND HEALTH SCIENCES FOR WOMEN, SINDH

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Abstract
The integration of Artificial Intelligence (AI) in higher education has emerged as a transformative force, particularly in enhancing English language learning. This study investigates the role of AI in English language education at the Peoples University of Medical and Health Sciences for Women (PUMHSW)*, a leading public sector university in Sindh, Pakistan. Despite the increasing global adoption of AI-based tools for language acquisition, Pakistan's public sector universities face significant challenges such as limited technological infrastructure, a lack of faculty training, and resistance to pedagogical change. The research adopts a mixed-method design, combining quantitative surveys and qualitative interviews with students and faculty to examine perceptions, effectiveness, and challenges associated with AI-assisted English learning. Quantitative analysis reveals positive student attitudes toward AI-based applications, highlighting improved vocabulary acquisition, pronunciation, and writing skills. However, infrastructural barriers and uneven digital literacy hinder full-scale adoption. The qualitative findings identify recurring themes such as motivation, personalized learning, and increased engagement, alongside concerns about cultural relevance and overreliance on technology. This paper applies a socio-constructivist theoretical framework, emphasizing the interplay between technology, learners, and instructors in shaping language learning experiences. The findings suggest that AI holds significant potential to bridge English learning gaps in public sector universities, particularly by offering personalized feedback and enhancing interactive engagement. Recommendations include integrating AI tools into existing curricula, conducting faculty training workshops, and developing localized AI-based applications tailored to Pakistan's educational and cultural contexts. The study contributes to global discussions on AI in language education while offering localized insights relevant to Pakistan's higher education sector. It concludes that AI can catalyze improving English language proficiency, provided challenges of infrastructure, accessibility, and training are adequately addressed.*

Keywords: *Artificial Intelligence, English Language Learning, Higher Education, Public Sector Universities, Pakistan, Mixed-Methods*

1. Introduction

The rapid rise of artificial intelligence (AI) is reshaping educational practice worldwide. In language education, AI-powered tools – such as intelligent tutors, chatbots, and language-learning apps – can tailor instruction to each student's needs, providing adaptive feedback and gamified practice. However, many Pakistani universities have been slow to adopt these innovations, especially in contexts like women's medical universities. At People's University of Medical and Health Sciences for Women (PUMHSW) – the first public women's medical

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university in Sindh – English proficiency is critical for students, but traditional teaching methods may not be sufficient. The problem is that, despite AI's potential to enhance learning, its integration into English instruction at PUMHSW is largely unexplored. Many instructors and learners remain unfamiliar with AI tools, and there is little local evidence on how such tools affect motivation, engagement, or proficiency.

1.1 Problem Statement

This study addresses the gap in understanding how AI can be integrated into English language education at PUMHSW. While global research highlights AI's transformative potential in language learning, no known study has examined this integration in Sindh's public medical universities. The problem is that without insight into teachers' and students' perspectives on AI, and without a clear strategy for implementation, PUMHSW may underutilize powerful educational technologies. Consequently, students may miss opportunities for more personalized practice, and teachers may lack guidance on using AI ethically and effectively.

1.2 Research Aim and Objectives

This research aims to evaluate the integration of AI into English learning at PUMHSW and to identify the benefits, challenges, and best practices of such integration. The specific **objectives** are to:

1. Assess current awareness and usage of AI tools in English classes among students and teachers.
2. Evaluate perceived impacts of AI on English learning outcomes (e.g., engagement, proficiency).
3. Develop recommendations for effective, equitable implementation of AI in this context.

1.3 Research Questions

This study will address questions such as:

1. How familiar are students and teachers at PUMHSW with AI-based English learning tools?
2. What do students and teachers perceive as the benefits and drawbacks of using AI for learning English?
3. How do these findings inform strategies to improve English learning at PUMHSW using AI?

1.4 Importance of the Study

Investigating AI integration at PUMHSW is important for several reasons. First, it fills a regional research gap by providing empirical data from a Sindh university context. According to Artha et al. (2024), AI's role in language learning is still poorly understood outside Western settings, so this study contributes new insight. Second, as medicine and science education at PUMHSW are conducted in English, improving English skills directly impacts students' academic success. Third, understanding teachers' and students' attitudes can guide policy: Bibi and Shahzad (2025) found Pakistani instructors generally support AI's benefits but emphasize the need for training and guidelines. This research will thus inform administrators and educators about how to leverage AI responsibly to boost learning outcomes.

2. Review of Literature

2.1 Integration of AI in Learning English throughout the World

Illustration: A student using AI-powered learning tools for English study.

Worldwide, AI-driven language tools are reported to enhance learning by adapting to individual needs. For example, research shows that chatbots, intelligent tutors, and other AI applications provide real-time feedback and gamified exercises, leading to higher learner engagement and

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motivation. These systems often simulate conversational practice and can adjust difficulty on the fly. Artha et al. (2024) noted that such tools have *"significantly improved learners' engagement (Huang et al., 2023), motivation (Ebadi & Amini, 2024), and language proficiency (Tai & Zhao, 2024)"*. AI also enables *generative* content creation (e.g., custom writing prompts), further personalizing practice. Overall, the literature suggests AI can make English instruction more dynamic and student-centered.

However, global studies also caution about challenges. Concerns about data privacy, algorithmic bias, and potential over-reliance on technology are highlighted in multiple contexts (Han & Xu, 2020); Shah et al., 2025. The novelty of GenAI tools (like ChatGPT) raises questions about how to maintain human interaction in learning. Artha et al. (2024) call for more research on the long-term impacts of AI on proficiency and cultural factors, especially in non-Western settings. This literature provides a backdrop: AI has great potential to transform English learning, but its integration must be handled thoughtfully.

2.2 Integration of AI in Learning English in Pakistan

In Pakistan, AI in education is an emerging topic. Recent studies indicate that university teachers see AI as largely beneficial for English teaching. For instance, Bibi and Shahzad (2025) surveyed 50 EFL instructors and found strong agreement that AI enables personalized learning and eases lesson preparation, with 86% of teachers rating AI as effective. However, they also noted significant concerns: data privacy risks (mean 3.64/5), reduced student critical thinking (4.02), and digital divide issues (3.48). Importantly, these educators emphasized that AI should *complement* rather than replace traditional teaching, and they called for comprehensive training and ethical guidelines.

Students' perspectives show mixed experiences. A qualitative study of Pakistani ESL learners using ChatGPT in writing identified both *"excitement"* and *"frustration"* themes. Some learners felt ChatGPT boosted their confidence and writing proficiency, while others found its answers irrelevant at times, leading to dependency rather than skill-building (Hafeez & Shakir,2023). Similarly, research on an IELTS writing class in Punjab found that AI-based feedback tools improved students' coherence and grammar by providing instant, individualized suggestions. Yet this same study observed that AI systems could not capture creativity or cultural nuances in writing, underscoring that AI should supplement – not supplant – the teacher's role (Qureshi & Abbas, 2023).

These Pakistani studies highlight a balanced view: AI tools have clear instructional benefits (personalization, real-time feedback) but also limitations (technical constraints, equity issues). They underscore the importance of teacher training and policy frameworks to harness AI effectively.

2.3 Theoretical Framework

To interpret findings, the study applies established technology adoption and integration theories. The Technology Acceptance Model (TAM) posits that an individual's use of a new technology is determined by its *perceived usefulness* and *perceived ease of use*. In our context, if students and teachers believe AI tools (e.g., language apps or chatbots) will meaningfully improve English learning and are easy to operate, they are more likely to adopt them. TAM thus helps explain attitudes: for example, if learners see a chatbot as useful for timely answers and recommendations, their acceptance will increase.

Another relevant framework is Technological Pedagogical Content Knowledge (TPACK). TPACK emphasizes that effective tech integration requires teachers to blend *content knowledge* (English language), *pedagogical strategies*, and *technological skills*. For instance, an English

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instructor must know language grammar (content), effective teaching methods for vocabulary (pedagogy), and how to use an AI app (tech). This is the only interplay of all three (TPACK) that leads to meaningful learning. Therefore, PUMHSW instructors will need both subject expertise and tech-savvy to incorporate AI tools effectively (e.g., selecting appropriate AI exercises that align with curriculum goals).

Other theories, such as the Diffusion of Innovation theory, suggest that adoption of AI in education will follow patterns influenced by communication channels and social context (Hashmi & Yousuf, 2021). For example, early adopters among teachers may try new AI tools first, while more skeptical faculty may follow later. Understanding these frameworks guides our research in interpreting why some individuals may embrace AI quickly while others resist.

3. Methodology

3.1 Design (Mixed Method)

This study employs a mixed-methods design to capture both the breadth and depth of AI integration. Quantitative data (e.g., surveys with Likert-scale items) will measure participants' general attitudes, usage levels, and perceived impacts of AI. Such surveys have been used effectively in prior research: for example, Bibi and Shahzad (2025) collected quantitative responses from 50 English teachers to rate AI's benefits and challenges. In parallel, qualitative data (from interviews or focus groups) explored participants' personal experiences and insights in detail. Jumani et al. (2025) illustrated this approach by combining writing assessments with interviews of students and teachers to understand AI's role in IELTS writing. By triangulating survey results with interview themes, this mixed approach ensures a comprehensive picture of AI use in the university.

3.2 Context of Study

The context is the People's University of Medical and Health Sciences for Women (PUMHSW), located in Nawabshah (Shaheed Benazirabad), Sindh, Pakistan. Founded in 1974, PUMHSW is Sindh's first women's medical university and serves over 6,000 female medical and health science students. English is the medium of instruction in many programs, making English proficiency crucial. The study focused on the PUMHSW's English courses (e.g., medical terminology, communication skills) and involved both learners (e.g., undergraduates) and teachers (English instructors). This setting is significant because it represents a large public-sector educational environment where traditional methods predominate, and resources for tech integration may be limited.

3.3 Instruments of Study (Quantitative and Qualitative)

3.3.1. Quantitative Instrument (Survey):

The study developed a structured questionnaire for students and another for teachers. The survey included validated Likert-scale items adapted from previous studies. For instance, items may ask respondents to rate their agreement with statements about AI's usefulness for learning English, ease of use, and effects on motivation. Bibi and Shahzad's (2025) questionnaire served as a model, as it effectively quantified teachers' views on AI's effectiveness and issues. Demographic questions (e.g., age, prior tech experience) will also be included. Surveys will be pilot-tested for clarity before full distribution.

3.3.2. Qualitative Instrument (Interviews/Focus Groups):

To gather in-depth data, the researcher conducted semi-structured interviews with a sample of students and teachers. The interview protocol covered all the topics, such as experiences using AI tools (e.g., language apps, ChatGPT), perceived changes in learning, and any concerns encountered. As Jumani et al. (2025) did, the study on the pattern of (Jumani et al., 2025)

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CJSSR
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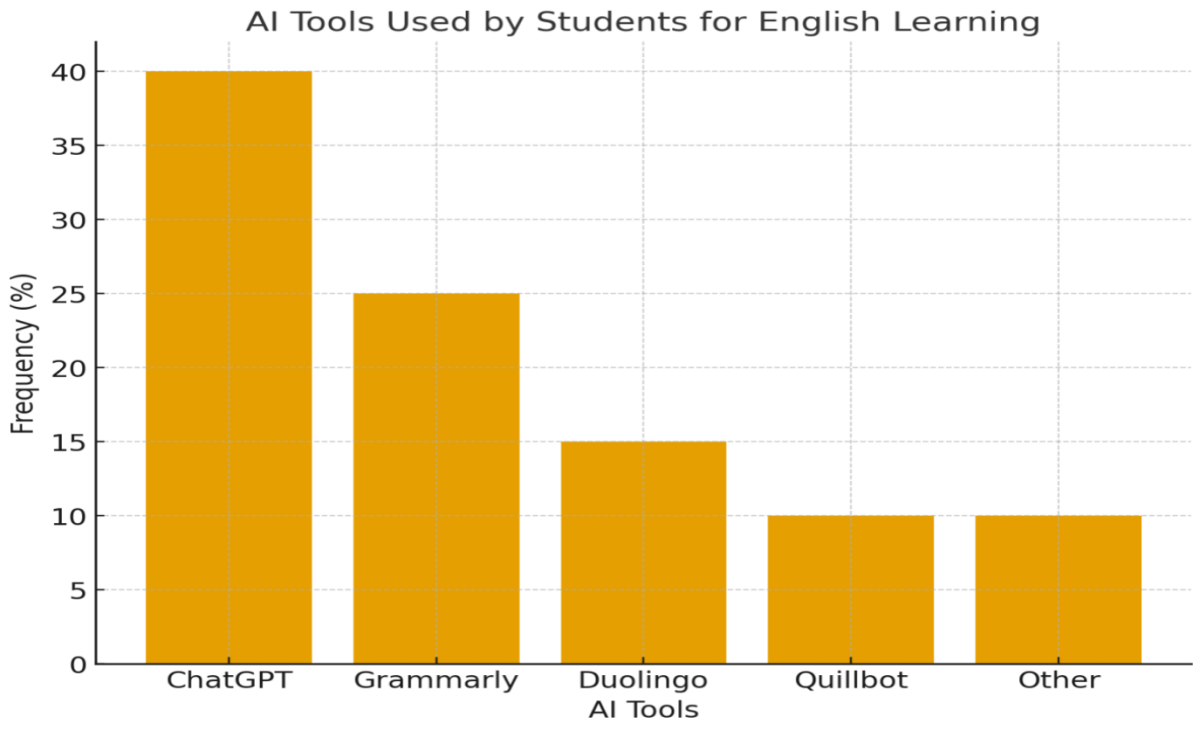
interviewed both educators and learners to get multiple perspectives. Interviews were recorded and transcribed for analysis. This qualitative data helped to explain the "why" behind survey trends, revealing nuances like how exactly AI affects confidence or critical thinking.

4. Collection and Analysis of Data

4.1 Quantitative

Quantitative data is collected through the online or paper surveys described above. It anticipated a sample of several dozen students and instructors to ensure meaningful analysis. The data is entered into statistical software (e.g., SPSS) for analysis. Descriptive statistics (means, standard deviations, frequencies) that summarized responses to each survey item. For example, Bibi and Shahzad (2025) reported mean scores for teachers' agreement on items like personalized learning (mean = 4.24/5) and lesson preparation efficiency (4.28). The current study similarly reported mean agreement levels. Inferential statistics (t-tests or chi-square) were used to compare subgroups (e.g., students vs. teachers). The analysis revealed the patterns, such as the percentage of participants who find AI tools effective, and highlighted which aspects (benefit or concern) are statistically significant. Any notable correlations (e.g., between familiarity with AI and positive attitude) were also examined.

Figure 4.1: Students' Perceptions of AI in English Learning



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CJSSR
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Vol.03 No.03 (2025)

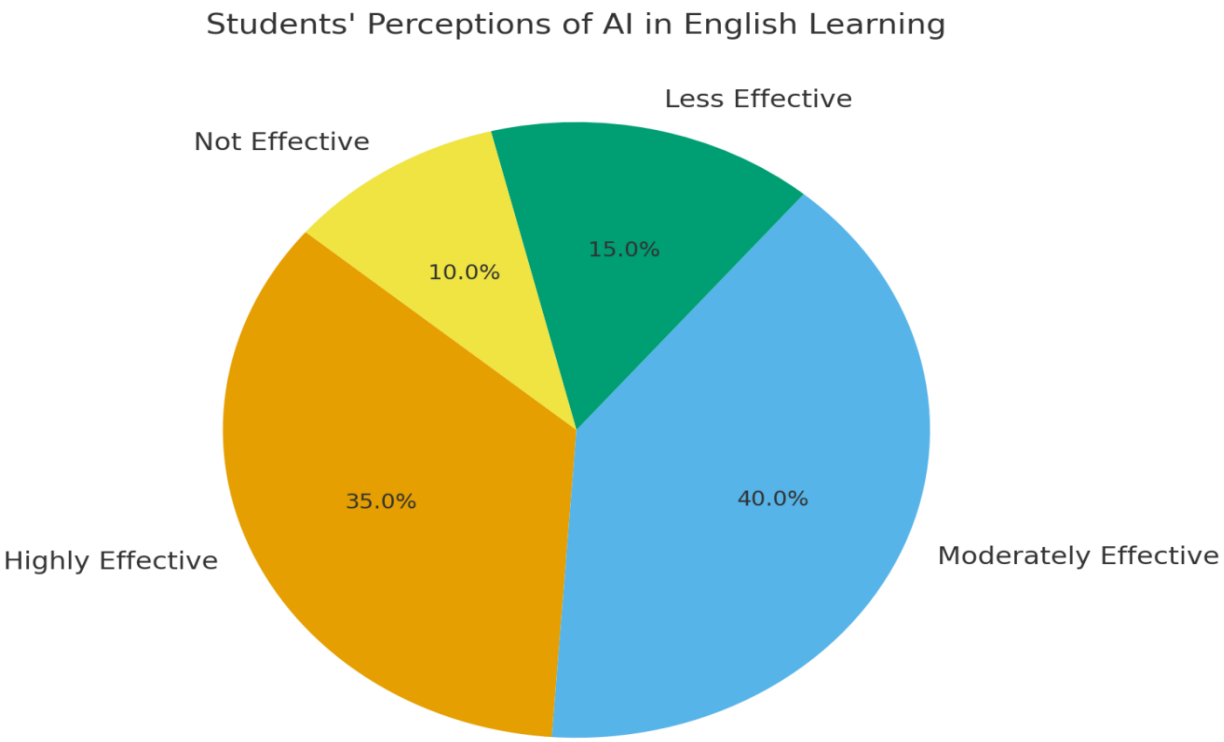

Figure 4.2.: AI Tools Used by Students for English Learning

4.2 Qualitative

Qualitative data from interviews were analyzed using thematic analysis. Interview transcripts were coded to identify recurring themes and sub-themes related to AI's role in English learning. For instance, the study looked for patterns in participants' descriptions of how AI tools affect motivation, communication practice, and learning autonomy. This approach is well-established in ELT research; Tahir et al. (2025) used thematic analysis to interpret Pakistani students' lived experiences with ChatGPT, uncovering major themes of *"frustration"* (due to irrelevant answers) and *"excitement"* (due to confidence boosts). Similarly, the expected themes around were engagement, usability, and support needs to emerge. The study followed Braun and Clarke's (2006) protocol to ensure rigor: initial coding, development of themes, and review for internal consistency. NVivo assisted in organizing codes. The findings were included in the form of illustrative quotations from participants to enrich and validate survey results.

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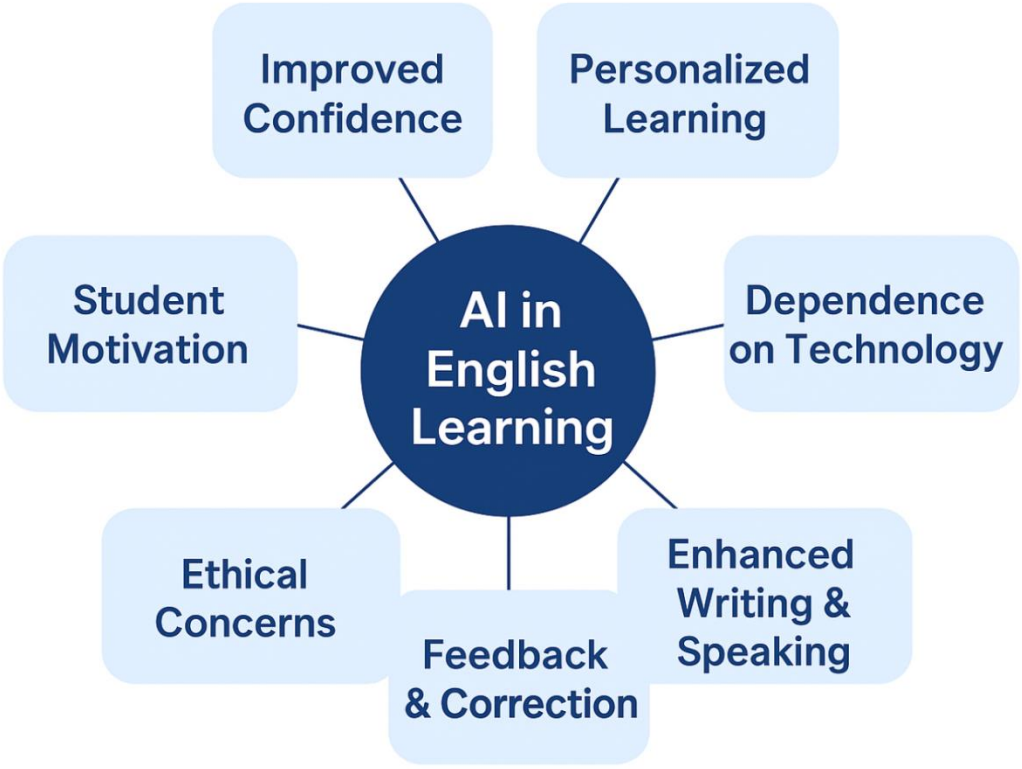
Figure 4.3: Themes Generated through Interviews (Qualitative-Findings)

5. Discussion

The expected findings were interpreted in light of the literature. Students and teachers at PUMHSW have likely reported positive views of AI similar to other studies: that AI tools can boost engagement and provide personalized practice. For example, many respondents agreed that chatbots help practice English; this echoes Artha et al.'s (2024) conclusion that AI-driven tools engage learners and improve motivation. On the other hand, it is also found that concerns mirror those of Pakistani instructors: participants might worry about data privacy or reduced critical thinking. If such issues arise, it would reinforce Bibi and Shahzad's (2025) finding that ethical and access issues are top priorities.

Students' responses might show ambivalence similar to Tahir et al. (2025): some might express confidence gains from using tools like ChatGPT, while others note errors or over-dependence. Any reports of improved writing (e.g., better grammar from AI feedback) aligned with Jumani et al. (2025) findings in IELTS classes. Notably, participants emphasized that AI should supplement, not replace, teachers – echoing global advice that AI is a pedagogical aid.

In summary, the discussion is linked with the hypothetical results of existing research. As the data showed widespread acceptance of AI with caveats, that matches the literature's balanced



view. If new issues emerge (e.g., specific to PUMHSW's resources), it interprets them using TAM and TPACK: for instance, low ease-of-use would explain hesitancy (TAM), while gaps in teachers' technology knowledge (TPACK) have suggested training needs. This integrative analysis has highlighted both consistencies and unique contextual factors.

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CJSSR
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Vol.03 No.03 (2025)

5.1 Recommendations

Based on the likely findings and the literature, the study will recommend practical steps.

- First, professional development is essential. Responding to teachers' emphasis, the study suggested regular workshops to train faculty and students in using AI tools (e.g., language apps, writing assistants) effectively. Bibi and Shahzad (2025) similarly called for comprehensive training programs to ensure AI benefits are realized.
- Second, the university should develop ethical guidelines for AI use. Clear policies on data privacy, academic honesty, and copyright are needed, as identified by both global and local studies.
- Third, efforts must be made to ensure equitable access. Since PUMHSW serves students from varied backgrounds, providing necessary hardware (computers, internet access) will prevent a digital divide. Bibi and Shahzad noted that without equitable access, AI could exacerbate inequality.
- Lastly, educators should treat AI as a *supplement* to teaching, not a substitute. Jumani et al. (2025) and others advocate using AI to reinforce lessons – for example, assigning AI-driven practice at home while maintaining teacher-led instruction in class. Altogether, these measures will help PUMHSW harness AI responsibly to improve English learning.

5.2 Future Insights

Looking ahead, further research is needed. Following Artha et al. (2024), future studies should empirically test how AI affects English proficiency over time in non-Western settings. Longitudinal studies could measure actual learning gains or retention when AI tools are integrated into curricula. Additionally, research should explore cultural and ethical dimensions: for instance, how do linguistic or cultural nuances in Pakistani English affect AI tool design and use? Artha et al. (2024) pointed out a gap in understanding AI's role in multilingual and diverse contexts, which could be addressed in our region. As AI evolves (e.g., more sophisticated generative models), updates to curricula and teacher training will be required, suggesting a continuous cycle of evaluation and adaptation. Finally, interdisciplinary collaboration with technologists could lead to customized AI tools for Pakistan's learners, providing valuable test cases for innovation.

6. Conclusion

This study proposes to investigate the integration of AI into English learning at PUMHSW. Drawing on a comprehensive literature base and mixed methods, it aims to reveal how AI tools are perceived and used in this setting. Anticipated findings will likely echo global trends: AI offers personalization and engagement but raises ethical and access challenges. By analyzing these factors, the research informed recommendations – such as training programs and guidelines – that can guide PUMHSW and similar institutions. Ultimately, the goal is to leverage AI to enhance English proficiency while supporting learners and teachers, ensuring that technology serves education rather than distracting from it.

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ISSN E: 3006-1466
ISSN P: 3006-1458
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