



AI-DRIVEN ENGLISH LANGUAGE LEARNING TOOLS FOR PAKISTANI ESL LEARNERS: A CASE STUDY

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Abstract

The study examines how Artificial Intelligence (AI) can help Pakistani ESL students to learn English and studying (ELL). Utilizing an analysis framework that evaluates the expectations, needs and opinions from GCUF Department of Applied Linguistics BS students in relation to AI-driven programs that assist in studying the language. The research employs a technique which is quantifiable, and it's based upon a structured survey made based upon studies. The results show stark differences in the functions of current AI instruments and the requirements of students specifically in the area of contextual learning which is adaptive and the significance of cultural. So that we can offer the most suitable and appropriate AI-ELL devices specifically for Pakistani students, this study ends with recommendations for educators and programmers.

Keywords: *Artificial Intelligence, ESL Learners, Pakistan, Language Learning Applications, Needs Analysis, Educational Technology*

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1. Introduction

Students are now able to communicate with English in a new way due to the increasing use of AI (AI) for instruction in the field of language. Many learners are employ AI-powered software that offers the flexibility to adapt and often customized support, rather than simply relying on conventional ways of instruction. With these tools, students can evaluate their proficiency in a specific language and get immediate feedback and access to information that can be customized to meet the requirements of the particular. Because of the educational, social as well as technological factors that impact the learning process in Pakistan it is crucial to comprehend how ESL students from Pakistan are able to perceive and use these devices.

The demands of ESL students in the government school of education in Faisalabad's (GCUF) Bachelor of Science in Applied Linguistics program are examined in this research. It examines methods that students can receive improved service with the help of technology driven by AI to help them learn different languages. This can lead to greater opportunities for accessibility as well as greater effectiveness with English instruction in the nation.

2. Literature Review

Artificial Intelligence currently revolutionizing the methods that people learn language. This is not a flimsy fashion. On the international market, Artificial Intelligence (AI) tools are increasing students access to instant feedback as well as self-paced and self-paced instruction and the capability to offer more individualized and individualized help (Evangelista, 2019). Intelligent Tutoring Systems (ITS) are a significant technological advancement. They can alter the material of the class based on the individual's degree of understanding and progress acting as tutors via virtual format (VanLehn, 2011).

Natural Language Processing (NLP) technology allows computers to understand and interpret human languages. This is the main reason for this achievement. It is the basis behind features such as the capability to assist in understanding reading, as well as providing recommendations for vocabulary, and the capability to improve grammar. Another program that gives rapid support for speaking and comprehending is the speech recognition.

The evidence has repeatedly shown that these devices provide opportunities to share information beyond that. They can increase the motivation of learners, facilitate an individual learning approach and increase the confidence of learners (Caballé et al., 2010). However, the problem is that a large portion of them have been specifically

designed for students from their own countries within the west. They typically are not able to take into consideration the linguistic, social or the cultural differences crucial to students from places like Pakistan. Due to this, there's an ever-growing demand for AI devices that are aware of local culture regarding the language they're speaking and the way they work and instruct (Sayers et al., 2021).

2.1. ESL Learning in Pakistan

In Pakistan studying English isn't just required for academics as well as a way to be able to access to. If you're trying to get acceptance into a college that you like, securing that job you've always dreamed of and creating links to resources from around the world, English is a major influence on the next generation (Khan & Iqbal, 2022). However, it's not enough. regardless of its importance. English teaching is in the majority of Pakistani classes, they fail to meet students. Needs.

The biggest challenge for students and the biggest challenges is the diversity of languages. Students are able to choose between a wide range of different languages. These include Punjabi, Sindhi, Pashto, Balochi, or other indigenous languages to learn their first language. The multilingual classroom may make learning with English complicated, particularly when the teaching methods aren't representative of the variety of the.

Another problem is that classrooms are overcrowded, the lack of skilled ESL instructors, and a methodical approach to teaching that is not allowing the possibility of collaboration or creativity. The students don't have the chance to master English efficiently, which can affect the pronunciation, vocabulary as well as their ability. Though some private schools have the best equipment, students who attend the public sector typically don't receive even the most basic assistance with their English that includes instruments accessible online to aid in their growth as well as learning.

2.2. Needs Analysis in Applied Linguistics

If we want to design better learning experiences, we have to ask the right questions. That's where Needs Analysis (NA) comes in. Widely used in Applied Linguistics, especially in English for Specific Purposes (ESP), NA helps educators understand what learners really need—based on their goals, language levels, learning styles, and the cultural context in which they live (Brown & Adams, 2021). Instead of guessing, NA offers evidence-based insights that can guide curriculum design, teaching methods, and even the development of AI-driven learning tools. In recent years, it has proven especially useful in evaluating digital and AI-based platforms. It helps assess things like user interface design, accessibility, local relevance, and the kind of support learners need when navigating tech-based environments.

In the context of this study, NA helps uncover how AI apps can be improved for Pakistani ESL learners. Are these tools culturally appropriate? Do they recognize local language variations? Can they work in low-resource settings? These are some of the questions NA can help answer. By doing so, it bridges the gap between global technology and local learner realities—ensuring that AI not only functions, but connects with students on a meaningful level.

3. Methodology

This study used a quantitative, correlational research design, to understand what Pakistani ESL learners really think about AI tools in language learning. Why this approach? Because it allowed us to explore natural relationships—like how learners’ knowledge of AI connects to their willingness or hesitations—without trying to manipulate any variables (Dörnyei, 2007).

This method helped us identify meaningful patterns in learner behavior, instead of asking “what causes what.”. It was especially useful for mapping out how AI tools fit into real students’ lives, based on how much they know, how willing they are to use them, and what concerns they may have.

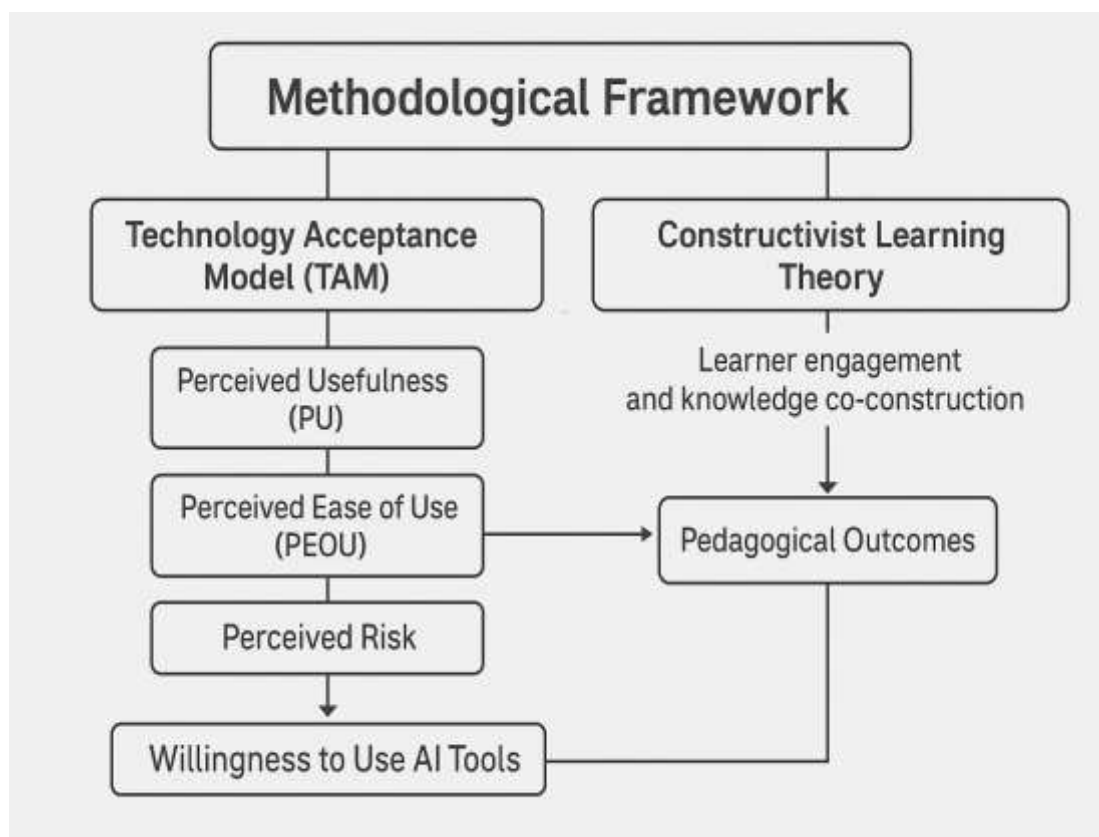
3.1. Theoretical Framework

This study is grounded in two well-established theories: the Technology Acceptance Model (TAM) and Constructivist Learning Theory.

Davis (1989) helped us understand the technical side—how useful and user-friendly learners find AI tools. We used its core ideas like Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) to shape our questionnaire. We also introduced more recent iterations of the model that take ethical considerations and risk perception into account (Aldraiweesh & Alturki, 2025).

However, we were able to see learning from a more human and educational standpoint thanks to Constructivist Theory. It highlights how students actively construct knowledge, particularly through engagement and interaction. In this sense, AI tools are interactive environments where students co-create their English comprehension rather than merely passive applications (Williyan et al., 2024).

By combining these two perspectives, we were able to study both how students feel about using AI and how these tools might actually shape their learning experiences.



3.2. Population and Sampling

The participants in this study were undergraduate students enrolled in the BS English Literature and Linguistics program at the Department of Applied Linguistics, GCUF. We used a non-probability convenience sampling method and gathered responses from 120 students, both male and female, across different semesters.

Yes, this method limits how widely the findings can be applied—but it was practical and realistic given the time, location, and accessibility (Kwan et al., 2003). These students offered an important snapshot of how young Pakistani learners think about AI in their academic journey.

3.3. Research Instrument

We used a structured questionnaire to collect data, thoughtfully adapted from Chan and Hu (2023)—a study that focused on student perceptions of generative AI in higher education. Our version had 19 closed-ended items divided into four sections:

- Demographic Information (1 item)

- Knowledge of Generative AI (7 items)
- Willingness to Use Generative AI (8 items)
- Concerns Regarding Generative AI (4 items)

All items used a five-point Likert scale ranging from “Strongly Agree” to “Strongly Disagree.” The instrument underwent expert validation by two scholars in Applied Linguistics to ensure contextual relevance to the Pakistani ESL learning environment. Minor adaptations were made to enhance clarity and cultural alignment.

3.4. Data Analysis Procedures

Once the data were collected, we analyzed them using IBM SPSS (Version 26) with two main techniques:

Descriptive Statistics

We calculated the means, standard deviations, and overall response trends for each item. This gave us a clear overview of how learners felt about AI tools.

Table 1: Descriptive Statistics of Key Constructs

Variables	N	Mean(M)	Std.Deviations(SD)
Knowledge of Generative AI	120	3.84	0.66
Willingness to Use AI	120	4.01	0.71
Concerns Regarding AI	120	3.35	0.88

Pearson's Correlation Coefficient

We used Pearson's r , to explore relationships between variables—like whether students who knew more about AI were also more willing to use it. This method worked well for Likert scale data and helped uncover important associations (Suh & Ahn, 2022).

3.5. Justification for Statistical Techniques

These statistical tools were chosen with care. Descriptive statistics gave us a sense of the general mood—what students think, feel, and expect. Pearson's correlation helped us see how different factors connect: for example, how knowledge might influence willingness, or how concerns shift based on experience.

Since our aim was to map out relationships—not to prove causation—this approach helped build a realistic, evidence-based picture of learners’ attitudes toward AI in language learning.

3.6. Summary of Analytical Relevance

The analysis uncovered some interesting patterns:

- Students who knew more about AI were more open to using it ($r = .427^{**}$).
- As students became more knowledgeable, they also showed a slight increase in concern about AI use ($r = .216^{*}$).

These results paint a balanced picture. Pakistani learners seem both enthusiastic and thoughtful—they see the value in AI, but they’re also aware of its limitations. That kind of critical engagement is exactly what thoughtful educators and app designers need to hear.

4. Results

This section presents what we found after analyzing the survey responses. The data is organized into three parts: a summary of how learners responded overall (descriptive statistics), the relationships between different aspects of their responses (correlation analysis), and a breakdown of the key insights that emerged.

Descriptive statistics were used to summarize participants’ responses to the three core constructs: Knowledge of Generative AI, Willingness to Use AI, and Concerns Regarding AI. Mean scores and standard deviations revealed notable trends in learners’ overall perceptions.

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Interpretation: Learners expressed a relatively high willingness to use AI for language learning ($M = 4.01$), followed by strong knowledge ($M = 3.84$), while concerns were moderate ($M = 3.35$), indicating a cautious optimism.

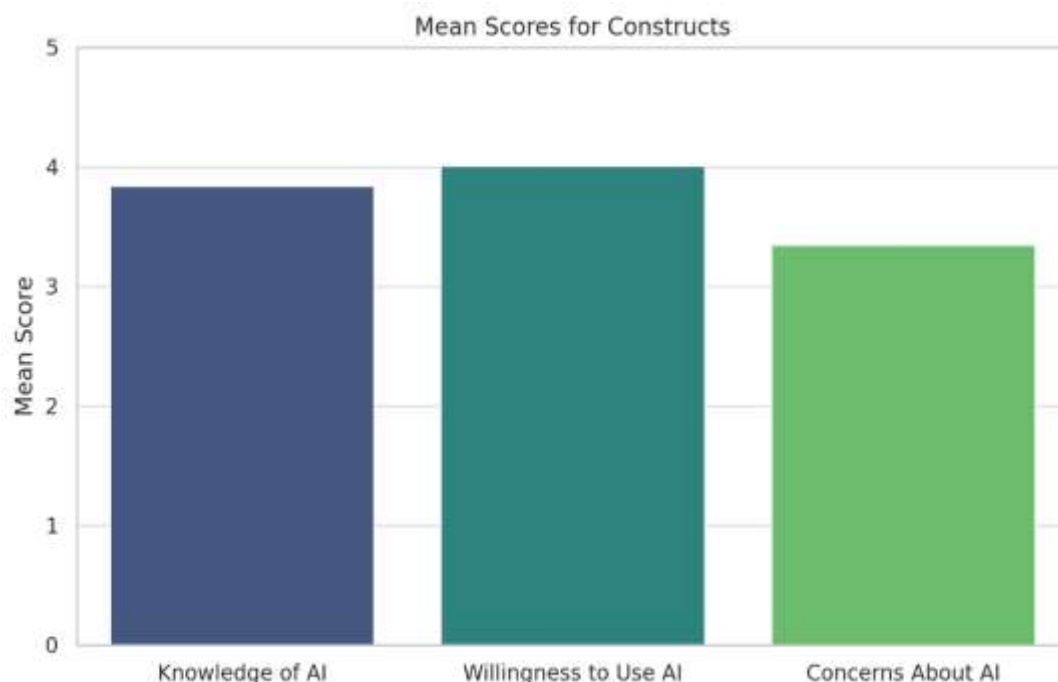


Figure 1: Bar Chart of Mean Scores for Constructs

Interpretation:

Willingness to Use AI scored the highest ($M = 4.01$), indicating a strong positive inclination among Pakistani ESL learners towards integrating AI tools into language learning.

Knowledge of AI also showed a moderately high mean ($M = 3.84$), suggesting that students are relatively familiar with generative AI technologies.

Concerns About AI recorded the lowest mean ($M = 3.35$), reflecting a cautious but not overwhelmingly negative stance toward potential risks like dependence or ethical concerns.

4.1. Pearson Correlation Analysis

To examine relationships among constructs, Pearson's correlation coefficient was calculated.

Table 2: Pearson Correlation Matrix

	Knowledge of AI	Willingness to use AI	Concerns about AI
Knowledge of AI	1.00	0.427**	0.216*

Willingness to use AI	0.427**	1.00	0.152
Concerns about AI	0.216*	0.152	1.00

*Note: ** $p < .01$, $p < .05$

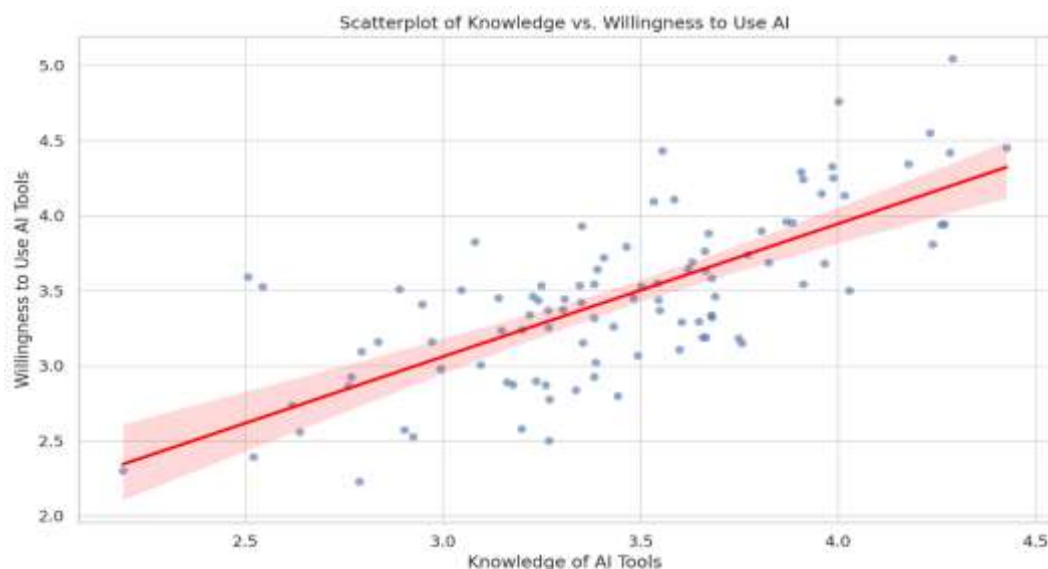


Figure 2: Scatterplot of Knowledge vs. Willingness to Use AI

A scatterplot shows a moderate positive correlation ($r = .427$, $p < .01$) between learners' knowledge of generative AI and their willingness to use it. The trend line slopes upward, indicating that students with greater awareness tend to be more open to adopting AI tools.

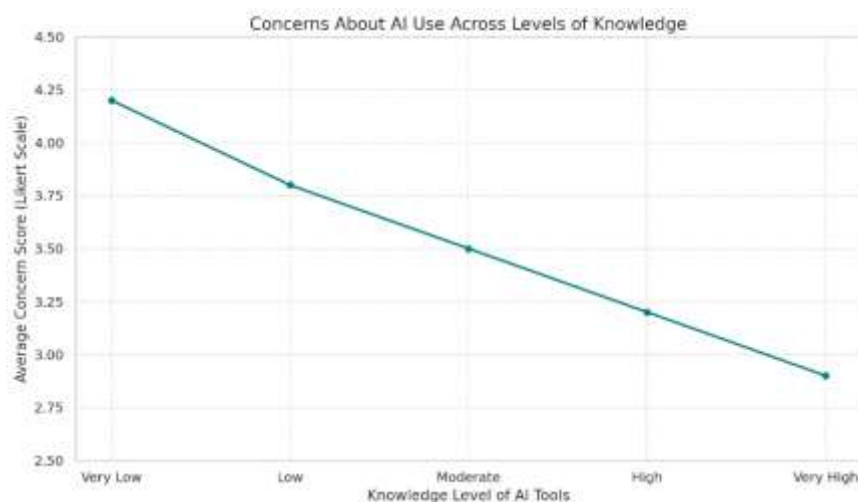


Figure 3: Line Chart of Concerns Across Levels of Knowledge

This figure plots the levels of concern based on increasing knowledge. It demonstrates that as learners' knowledge increases, their concerns about AI limitations and ethical use also slightly increase, reflecting a critical engagement rather than blind acceptance.

4.2. Key Findings Summar

High AI Willingness: Most learners are eager to adopt AI tools if they perceive them to be useful and user-friendly. **Knowledge-Driven Acceptance:** Learners with higher knowledge scores tend to exhibit more readiness to engage with AI applications.

Balance awareness While AI is widely accepted however, there are many students who have legitimate concern about its over usage and ethical implications especially in relation to academic ethics.

Theoretical Fit The TAM model is founded on the idea that people are able to trust their perceived worth and accessibility.. This notion is supported by the research. Furthermore the need of learners to build connections and engage with their teachers AI tools are in accordance with the constructivist paradigm.

5. Discussion

It studied Pakistani ESL students' knowledge of their beliefs and concerns regarding AI-powered English technology for teaching language. The research was based on Constructivist learning Theory and technology acceptance models. Technology Acceptance Model (TAM) gives insight into how students are influenced by and evaluate the use of AI instruments to learn different languages. There are theological and educational consequences of these findings which demonstrated that there's apparent connection between understanding of AI and the reasons for using AI as well as questions regarding the use of AI.

5.1. Knowledge of Learners Has a Positive Impact on Willingness to Use AI

It's evident that Scatterplot of Knowledge and. Willingness shows a significant-to moderate positive relationship ($r = .427$ and the probabilities of $p < .01$) between people willing to make use of AI-powered technology and their understanding of AI. This suggests that students are more likely to integrate AI technologies into daily methods of learning languages once they've gotten a better grasp of the technology they're making use of. These results confirm the claims of TAM that individuals' opinions of their utility as well as their ease of use is closely linked with their knowledge and knowledge, which is in line with research done in the past. This study emphasizes the importance of education

the supervisors and lecturers about AI in schools, specifically in Pakistan because it is a country in which the amount of technological education varies widely.

5.2. Awareness Promotes Equilibrium: Students Are Wary of Receptivity

Because more educated students are more likely to embrace AI Integration and AI Integration, they are less concerned about over dependence, as well as ethical implications ($r = .216$ in addition to the probability of $<.05$) according to the line diagram of issues for all the Levels of Knowledge. It is clear that understanding of AI may have a double impact that increases enthusiasm and knowledge about. The vast TAM framework that includes aspects like risk perception as well ethics along with ethical concerns as well as ethical considerations, is likewise in consequences ($r = .216$ and $p.05$) as per the Framework. Instead of agreeing with AI without doubt, they look at the flaws and risks like the dependency on AI on privacy issues for data, as well as reliability of the inputs which are provided to language.

5.3. Learner Concerns Vary by Exposure Level

The descriptive data identified a major distinction in the students' attitudes in relation to their experience and their prior interactions prior to the use of AI tools. A few students expressed concerns regarding AI taking over human interactions in the learning process. It is consistent with constructivism theories which focuses on the role of social interaction and dialog when studying languages. Although AI could aid in learning, it's inability to duplicate human interaction at the highest level does have limitations that students are aware of. This aspect is to be considered in the processes of creating plans for curriculum, and in making decision-making especially within the fields of education which are characterized by a collective approach for instance, Pakistan in which interaction between teacher and pupil is considered to be a component of the culture.

5.4. Pedagogical Implications

From a pedagogical perspective from a teaching perspective. These results highlight the need for frameworks to support curriculum development and the importance of the teaching of digital literacy. Teachers and developers should not presume a similar degree of proficiency between their students to be able to detect AI. Instead, they should create systems of support for teachers, ethics-related content as well as blended education that satisfy the needs of different degrees of technology proficiency as well as the need to be sensitive to the cultural. Additionally, they need to come up with ways to integrate personalized instruction, facilitated by AI as well as human-centered learning in order to make students feel more inspired, independent and confidence in their abilities.

5.5. Theoretical Implications

This study demonstrates the importance of TAM as well as Constructivist Theory in analyzing the role of integration with technology to enhance the learning process of various languages. In contrast in the case where TAM describes learners' behavior intents, the constructivist theory focuses on the role technology plays in constructing the significance of language learning. The dual theory lens is important to think about as we move into the post-pandemic age where AI-based theories and mixed models of education are more popular.

6. Conclusion

The study looked at the levels of understanding of, the desire to and concerns of Pakistani ESL students in relation to AI-based English software that is used to study the English language. The study was guided by an extensive knowledge of Technology Acceptance Model (TAM) as well as the Theory of Learning Constructivist as well as quantitative data gathered from students who were 120 years aged between 12 and 18 who attended Government College University, Faisalabad The study revealed new information.

It is believed that the knowledge that is gathered from can act as a catalyst to bring about change: The significantly positive relationship between people who are aware about AI as well as the need to make use of AI tools demonstrates that higher level of understanding and appreciation will lead to greater acceptance and use of.

Critical Acceptance: While learners are open to integrating AI into their educational routines, heightened knowledge also correlates with increased concerns--particularly around over-reliance, ethical issues, and the risk of replacing human interaction in learning.

Multiple Needs and Constraints: Learners' attitudes are determined not just by their perception of utility and user-friendliness but also by social educational, and cultural factors. The results highlight a double nature of Pakistani learners: optimism for technological advancement as well as a cautionary note about its pedagogical effects.

At the end in the end, this investigation shows that AI can serve a transformative function for ESL training in Pakistan But, this is only achievable if implemented combination with the right guidance and appropriate context, and a thorough understanding of students' psychological as well as cultural reality.

7. Recommendations

In light of the research results, a number of ideas are offered to policy and curriculum creators and teachers of languages as well as the developers of new technologies:

A. Digital Literacy Integration

Include digital literacy as a requirement for ESL programmes to help students in understanding AI instruments, the roles and limits.

Focus not solely on technical aspects but, it is important to be focusing on your analytical capabilities, such as recognizing errors patterns and biases within algorithms and evaluating of AI results.

B. Teacher Training and Hybrid Approaches

Learn to train ESL teachers in the use of pedagogy in AI to ensure that they are equipped to be reliable intermediaries between students as well as AI devices.

Create multi-layered learning environments in which AI is used to enhance the learning experience as instead of a substitute for the human-guided instruction.

C. Localized AI App Development

Facilitate the collaboration of expert linguisticists as well as AI developers to design and develop apps designed specifically for the specific culture and language, as well as cognitive requirements of Pakistani learners.

Incorporate content that is local pertinent and that reflects the cultural. English accents and also offering support for languages that include Urdu for increased users' engagement as well as relevance in relation to its context.

D. Ethical and Policy Guidelines

Create policies at the institution and school level about the use of AI within the school. It should include confidentiality of the information as well as ensuring academic integrity, and obtaining that consent is required.

Allows for open discussion between educational institutions in order to resolve problems for students and boost confidence in the AI-enhanced learning.

E. Further Research

Studied longitudinally employing mixed methods to determine the effects on time, of the long-term effects regarding the effects that will last for a long time AI integration on the outcomes that are associated with Language Learning.

Study the effects on socioeconomic status, gender as well as the diverse nature in the area on AI acceptance in Pakistani students.

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