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AI AS A DIGITAL LANGUAGE PARTNER: EFFECTS OF CONVERSATIONAL CHATBOTS ON SPEAKING FLUENCY AND INTERCULTURAL ANXIETY AMONG PAKISTANI ESL LEARNERS

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Abstract

The study investigates how conversational AI chatbots, such as ChatGPT and Replika, support Pakistani ESL learners in developing oral fluency and intercultural communication skills. Complex dynamic systems theory, Krashen's affective filter hypothesis, and Bandura's social cognitive theory suggest that AI-mediated practice reduces anxiety and improves speaking outcomes by enhancing technical self-efficacy. To test hypotheses on chatbot usage, interaction type, and significant learner variables, multiple and hierarchical regression were applied to the dataset. Structured, role-play-based AI interaction predicts oral fluency and communicative skill better than formal training. Chatbot use and communication anxiety reduction are highly moderated by technological self-efficacy. The benefits demand internet access and self-efficacy, highlighting unfairness risks. The study found that AI chatbots are effective instructional aids. AI conversation practice in curricula requires planned, scaffolded integration, proactive development of learners' digital and linguistic self-efficacy, and policy action to reduce the digital gap. This evidence-based method is needed to realize AI's egalitarian and revolutionary potential in Pakistan's ESL setting.

Keywords: *AI Chatbots, ChatGPT, Digital Language Partner, ESL Learners, Pakistan, Replika*

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1. Introduction

Artificial intelligence (AI) in education has revolutionized language learning, with conversational AI chatbots leading the way. These artificial beings use large language models (LLMs) like GPT-4 to simulate human-like interaction and offer a dynamic, responsive, and often tailored communicative experience. OpenAI's ChatGPT and Replika offer a new generation of technology-mediated learning settings. Unlike classrooms or human-tutor interactions, these systems offer scalable, time- and location-independent practice. These systems offer ESL learners a compassionate, non-judgmental, and always-available partner for target-language output, a key yet often anxiety-inducing stage in becoming proficient (Swain, 2005). When immersive environments or native speakers are scarce, international research efforts focus on experimentally investigating the pedagogical usefulness of these rapidly growing technologies. Speaking fluency, not simply speed, but also smooth, logical, and automatic speech without hesitation, is an essential yet challenging goal for many ESL learners. Fluency requires a lot of meaningful practice in producing and expressing ideas in the moment, which is often hindered by affective barriers like communication anxiety. Intercultural communication increases anxiety because students must deal with perceived cultural differences in norms, expectations, and pragmatic practices in addition to language problems. Intercultural Communication Anxiety (ICA) arises from the fear of being misinterpreted across cultures, which can lead to identity risk and social appraisal (Siddiqui et al., 2025; Neuliep, 2019). In post-colonial countries like Pakistan, where English is an official language and a key tool for socioeconomic mobility, students may find the transition from classroom instruction to fluid, cross-cultural communication frightening. Due to its limitations in targeted speaking time and authentic multicultural practice, the standard ESL classroom often fails to address these interconnected challenges of fluency improvement and anxiety reduction. Conversational AI may work here. These chatbots can scaffold the learner's zone of proximal development by modeling, rephrasing, and replying (Vygotsky, 1978). Most significantly, they create a low-stakes setting to target performance-impairing affective filters (Krashen, 1982). The anonymity and lack of human judgment in AI communication can reduce language anxiety by reducing the worry of being judged. It may free up cognitive resources for language and risk-taking (Horwitz et al., 1986; Shahzad et al., 2025). Complex chatbots can mimic cross-cultural situations or identities, giving students safe, repeatable practice in cross-cultural communication without the high stakes of real-world repercussions. This aligns with experiential learning and dynamic evaluation, which foster competence and confidence through safe experimentation. Initial empirical studies support these claims, but they are primarily from outside Pakistan. Students who use ChatGPT or Replika report lower anxiety about learning a foreign language and better conversational skills (Kohnke, 2023; Yang et al., 2023).

However, the impact on Pakistani ESL is understudied and needs immediate research. Pakistan's linguistic ecosystem is challenging because Urdu, Punjabi, Sindhi, and Pashto coexist with Urdu and English as official languages. English competency is a strong indicator of social and educational prestige, even when instructional quality varies by socioeconomic status and urban-rural location (Rahman, 2020). Pakistani students are often enthusiastic despite many challenges due to teacher-centric pedagogies, a lack of genuine communication, and examination systems that have historically emphasized receptive abilities over productive fluency (Ali, 2020). Thus, even though kids have declarative knowledge of grammar and vocabulary, they struggle to use it quickly and efficiently in unplanned, culturally complex conversations, which makes them more uncomfortable in actual communication situations. Investigating whether AI chatbots can fill this gap with low-anxiety, high-frequency practice is not just an intellectual exercise; it has significant implications for educational fairness and policy.

Also important is this study's intercultural component. Pakistani ESL students use English as a global, Western-centric language. Their English is cross-cultural for professional, academic, and internet communication. Fear of pragmatic rules like formality, civility, and conversational patterns, which are rarely taught, can induce anxiety. Highly developed conversational AI trained on extensive, multicultural corpora can respond correctly to a variety of pragmatic inputs and expose learners to multiple interactional approaches. This practice-oriented exposure may reduce ICA by demystifying intercultural communication and promoting pragmatic understanding. This promise is limited by valid concerns, such as the potential for AI to reinforce linguistic or cultural biases in its training data (Bender et al., 2021), the lack of proper emotional reciprocity, and the risk that highly scripted interactions will fail to prepare students for the unpredictable nature of human conversation. These problems demand context-sensitive, comprehensive investigation.

This study fills a gap in the literature by evaluating how conversational AI chatbots affect speaking fluency and intercultural communication anxiety among Pakistani university-level ESL learners. This empirical, mixed-methods study goes beyond general perception surveys to examine whether prolonged engagement with AI dialogue partners can improve participants' speech fluency markers, as measured temporally and qualitatively, while reducing their self-reported and observed intercultural English communication anxiety. By setting the research in Pakistan's unique sociolinguistic and educational context, the research aims to produce findings that are both practically useful for educators, curriculum designers, and policymakers in comparable EFL/ESL contexts and theoretically instructive for CALL and applied linguistics. As AI technologies become more incorporated into education, understanding how they might empower students by addressing core affective and procedural challenges is key to maximizing their potential.

Pakistani ESL is in dire need of AI research in language instruction, despite a global surge. ChatGPT and Replika improve writing, reduce language anxiety, and enhance learner engagement, according to international studies (Deng & Yu, 2023; Kohnke, 2023). These studies were conducted in East Asian, European, or North American schools with distinct technology, digital literacy, and English sociocultural positioning compared to those in Pakistan. Thus, empirical, context-sensitive research on how these findings relate to Pakistani learners, whose distinctive linguistic landscape, educational obstacles, and cultural dynamics mediate technology and English use, is limited. Using worldwide findings to guide pedagogical interventions risks neglecting local demands.

No research exists on how long-term use of conversational AI affects Pakistani trainees' spoken fluency. ICT tools, mobile-assisted learning, and perceptions of digital resources have been employed in a Pakistani study of technology-enhanced language learning, rather than advanced generative AI, to measure speaking practice. Speaking skills studies may use self-reported data or qualitative assessments without pre- and post-intervention analyses of fluency markers, such as speech rate, mean length of run, phonation time ratio, or grammatical complexity. No one knows if regular AI chatbot contact promotes speech automation or merely gives trainees experience. Evidence-based technology is needed, as Pakistani graduates entering the sector struggle with fluency in speaking, a critical indicator of functional ability and confidence (Ali, 2020).

In addition, local literature has barely mentioned AI chatbots and intercultural communication anxiety. Pakistan has studied generic foreign-language anxiety but not cultural frames of reference, pragmatics, or identity in English-mediated communication (Akram & Ghani, 2013). AI exposure treatment that mimics intercultural events or encourages the adoption of alternative identities is unique, but no studies have examined whether it desensitizes Pakistani pupils to cross-cultural conversational pressures. Unsolved issues include the cultural biases and prejudices of Western corpora-trained AI models. How Pakistani learners negotiate, accept, or oppose these cultural norms during contact, and whether this reduces anxiety or promotes linguistic imperialism or cultural dissonance, remains unknown (Bender et al., 2021). Intercultural communication is crucial to Pakistani youth's worldwide employability; hence, this is a theoretical and practical issue.

Pakistan's infrastructure and social disparities are exacerbated by a lack of study. Digital literacy, reliable internet access, and advanced devices differ significantly between urban Lahore and Karachi and between rural and peri-urban areas (Raza et al., 2023). Technology anticipated in AI education books is lacking in Pakistan. The practicality, accessibility, and efficacy of AI language partners across different countries have not been examined. No research has examined whether such technologies could worsen educational inequities or, if used wisely, bridge resource gaps by delivering high-quality practice in

low-resource locations. We need specialized expertise to make fair and practical AI policy recommendations for Pakistan's ESL environment.

AI for conversational practice in Pakistan has not been morally or pedagogically assessed. Local researchers have not addressed learner autonomy, over-reliance on non-human input that may be inaccurate, human-centered learning, or data privacy. Global literature debates these issues (Zawacki-Richter et al., 2019), but Pakistani cultural and religious sensitivities, which may affect attitudes toward anthropomorphic AI like Replika or data sovereignty, have not been examined. The literature deficit includes efficacy and comprehensive impact assessment. In conclusion, Pakistan's ESL ecosystem lacks a comprehensive, localized research agenda that goes beyond broad perception surveys to provide empirical data on the psycholinguistic (fluency), emotive (ICA), and socio-material (access, ethics) effects of conversational AI chatbots. That the global movement toward AI-driven language learning aligns with Pakistani learners' demands and adapts to their context requires closing this multidimensional gap.

2. Problem Statement

Pakistani ESL learners struggle to build oral fluency and manage communication anxiety because traditional instruction emphasizes grammatical precision and receptive abilities over meaningful, interactive speaking practice (Shamim, 2011; Ali, 2020). It causes students to struggle with spontaneous English communication after years of formal training, hindering their academic and professional ambitions in a globalized society. Language competency is extremely difficult in multicultural circumstances due to pragmatic standards and perceived cultural differences. Advanced conversational AI chatbots, such as ChatGPT and Replika, may alleviate this longstanding problem, though their efficacy remains unknown. Such technologies reduce language anxiety and provide practice worldwide (Kohnke, 2023), but their impact on Pakistan's sociolinguistic and educational environment remains uncertain. Importantly, there is no localized evidence to show whether these AI partners increase objective metrics of spoken fluency, such as speech rate, coherence, and automaticity, or lower Pakistani learners' intercultural communication fears. A lack of study may lead educators and policymakers to neglect or promote a powerful instructional tool without appreciating its usefulness, cultural relevance, or potential to exacerbate digital inequality (Raza et al., 2023). Thus, the dearth of context-specific empirical research on whether and how conversational AI chatbots might improve Pakistani ESL learners' speaking fluency and intercultural communication anxiety creates a worrisome gap between the technical promise and pedagogically sound, fair implementation.

2.1. Research Objectives

- Examine the impact of AI chatbot interaction frequency and kind on Pakistani ESL learners' oral fluency growth (speech rate, automaticity).

- To examine how demographic factors (e.g., prior training, digital access) and AI chatbot use affect learners' intercultural communication anxiety.
- Evaluate the impact of AI-mediated practice sessions and sociolinguistic factors on spoken discourse coherence and pragmatic competence development.
- To study how technological self-efficacy and chatbot engagement characteristics reduce communication anxiety while controlling for traditional instruction exposure.

3. Literature Review

The global landscape of English language acquisition has long been characterised by a search for educational approaches that may bridge the gap between formal instruction and actual communicative ability. This problem is terrible in places like Pakistan that used to be colonies. English is still the language of authority, higher education, and social mobility, but effective teaching methods often cannot keep up with what students require. According to researchers such as Shamim (2011), the traditional ESL classroom in Pakistan has long been based on grammar-translation, rote memorization, and receptive skills, making it a place where accuracy is more important than fluency. This approach to teaching, while giving students a solid understanding of syntax and vocabulary, often does not help them have spontaneous, meaningful conversations. Ali (2020) says that the result is a generation of students who, after years of formal study, are very anxious and unable to use English in real-world academic or professional settings. It makes it harder for them to reach their personal and national goals in a world that is becoming more connected. This fear is exacerbated in intercultural contexts, when learners must contend not only with linguistic challenges but also with foreign pragmatic norms and perceived cultural distances, thereby increasing what Neuliep (2017) characterizes as intercultural communication apprehension.

The theoretical foundations of this dilemma are thoroughly examined. Krashen's (1982) Affective Filter Hypothesis offers a significant perspective, positing that fear, diminished motivation, and insufficient self-confidence function as cognitive barriers, obstructing comprehensible input from accessing the brain regions fundamental to language acquisition. The conventional Pakistani classroom, which emphasizes error correction and teacher-centered authority, may inadvertently reinforce this emotive filter. On the other hand, Long's (1996) Interaction Hypothesis states that learning a language is easier when people talk to each other and negotiate meaning, and that when communication breaks down, people need to clarify, give feedback, and adjust their output. In Pakistan, where resources are limited and classes are huge, this kind of engaging, meaning-focused practice has been hard to find. Bandura's (1997) notion of self-efficacy, the conviction in one's ability to perform actions required to achieve particular performance outcomes, is profoundly significant. Learners who do not have opportunities

to practice communication in a low-stakes setting are unlikely to build the language and communication self-efficacy they need to interact confidently, which creates a cycle of avoidance and fear.

Technology-assisted language learning has become a game-changer in response to these ongoing problems. From early language labs to multimedia software and internet exchanges, each new technology promised practice that was more tailored, easier to access, and more engaging. The newest and possibly most disruptive wave is powered by conversational AI chatbots, such as OpenAI's ChatGPT and Replika. These systems, which use large language models (LLMs), represent a significant change in how things work. Unlike previous scripted or rule-based chatbots, LLM-driven agents may create human-like, contextually relevant conversations on a wide range of themes. It gives the impression of an honest discussion without the time limits or judgments of a human partner. Kohnke (2023) emphasises their potential as perpetually accessible, patient, and non-judgmental digital language partners that can provide infinite possibilities for output practice, a resource traditionally recognised as significantly deficient. For anxious students, being able to practise in a quiet, low-pressure setting might significantly reduce Krashen's affective filter, allowing them to take in more information and encouraging them to take risks. Fryer et al. (2020) and Huang et al. (2022) are two studies that show that chatbots can keep learners motivated and give them valuable conversational practice. Huang et al. (2022) also show that chatbots can help improve specific language skills.

It is also interesting that these technologies could help people communicate more fluently. In second language study, fluency is generally measured by how fast someone speaks (syllables per minute), how long they run (the number of syllables between pauses), and the phonation time ratio (the amount of time they spend speaking versus halting). To become fluent, you need what Segalowitz (2010) calls "practice in becoming efficient." It means a lot of practice making and sending meaningful messages under time limits. AI chatbots offer an unparalleled medium for such practice. A learner can participate in continuous, topic-focused dialogue at any hour, obtaining prompt written or, increasingly, verbal replies. This makes it possible to proceduralize language, the process of moving from slow, declarative knowledge to fast, automatic processing. This is a key part of being fluent. The ongoing need to understand input and provide prompt responses simulates the cognitive demands of genuine communication, potentially expediting the development of automaticity. Nonetheless, the preponderance of this nascent research stems from technologically advanced or distinct language environments, thereby creating a significant gap in understanding its effectiveness within Pakistan's specific sociolinguistic and infrastructural Framework.

There are many opportunities and constraints in this ecosystem. On the one hand, mobile internet usage is growing rapidly, making digital tools more accessible than ever.

Raza et al. (2023) argue that the digital divide persists, meaning access is often divided along gender, socioeconomic status, and geographic lines. Cost, connectivity, and digital literacy are significant barriers to getting online. In addition, the learning environment is important. Pakistani educational culture, which values teachers' authority and has a long history of passing on knowledge, may shape how students view AI as a valid learning tool or partner. In chatbot conversations, cultural relevance is significant. It includes things like subjects, values, and ways of talking. An AI trained mostly on Western texts might give answers that are grammatically correct but do not make sense in a practical or cultural context, which could confuse learners or make them feel even more out of place in their own culture. Consequently, the examination of AI chatbots in Pakistan should go beyond mere technological transfer to encompass social integration and equitable deployment. The phenomenon of communication anxiety, particularly in multicultural contexts, constitutes the second essential pillar of our investigation. Language anxiety is a well-established concept, as characterized by Horwitz et al. (1986) as a "distinct complex of self-perceptions, beliefs, feelings, and behaviors related to classroom language learning arising from the uniqueness of the language learning process." Pakistani learners frequently experience heightened anxiety when their interactional partner is regarded as a native speaker or an individual from a distinct cultural background, eliciting concerns around comprehension, appropriateness, and unfavorable assessment. Neuliep (2017) discusses intercultural communication apprehension, the anxiety that comes with talking to people from other cultural groups. AI chatbots, being impartial and not human, could, in theory, be a safe place to start. Learners may have "mastery experiences" with an AI, which is the best way to boost their self-efficacy. Effectively navigating simulated intercultural situations (e.g., a job interview with a foreign recruiter, casual conversation at an international conference) with a chatbot could provide learners with rehearsed phrases, practical routines, and, crucially, enhanced confidence in their ability to manage analogous real-world interactions, thereby alleviating anticipatory anxiety.

However, this potential comes with several problems and gaps in the study. First, the kind of interaction is critical. Chat that is not structured or does not have a clear purpose can be fun, but it may not be helpful for learning. On the other hand, highly structured, task-based interactions (such as "simulate a complaint at a hotel") may be effective for teaching specific skills. The "type" of chatbot interaction, social, task-oriented, or role-play, is a significant feature whose impact on fluency and anxiety consequences remains underexplored, particularly in a Pakistani context. Second, the significance of learner individual differences is paramount. A learner's pre-existing technical self-efficacy, or confidence in using digital tools, will undoubtedly influence their engagement and gains from AI chatbot practice. Bandura's theory suggests that a learner with poor technological self-efficacy may approach the AI with apprehension, hence diminishing its capacity to

alleviate anxiety. Likewise, a learner's attitudes toward language acquisition, their instrumental vs. integrative motivation, and their access to dependable technology will all influence the outcome.

Additionally, AI can help with practice, but its ability to provide detailed, culturally sensitive feedback on spoken output, especially pronunciation, intonation, and advanced pragmatic nuance, is still developing. Most chatbots currently work with text, but speech-to-text and text-to-speech capabilities are improving. The feedback loop for spoken fluency may be indirect: the learner generates spoken language, receives a text answer, and must engage in self-monitoring. The effect of this indirect connection on the cultivation of automaticity in speech, as opposed to text-based formulation, necessitates meticulous empirical examination. Ethicists have also highlighted concerns that LLMs' training data may reinforce or even intensify linguistic and cultural biases. An AI that does not understand or respond correctly to Pakistani English dialects or cultural references could be frustrating or even harmful for Pakistani learners.

In conclusion, the emergence of advanced conversational AI offers an intriguing, albeit unsolved, possibility to tackle the persistent issues of speaking fluency and communication anxiety that afflict Pakistani ESL learners. The theoretical principles from second language acquisition, which emphasize the necessity for low-anxiety, high-interaction, and output-rich practice contexts, resonate strongly with the claimed benefits of these digital partners. Nevertheless, turning this technological promise into real, fair, and culturally relevant educational benefits is not easy. It depends on many factors, such as how chatbot interactions are designed and implemented, the unique traits of the learners, the sociocultural context of acceptance and use, and the complex ways practicing with an AI can improve communication between people, especially across cultural boundaries. The current literature, however, is expanding and provides limited localized evidence from Pakistan. It has not yet provided definitive answers on whether AI chatbots can significantly expedite the development of objective fluency metrics, such as speech rate and automaticity, for Pakistani learners, or whether they can serve effectively as a therapeutic instrument for alleviating profound intercultural communication anxiety. This knowledge gap is a significant area for investigation. Without a thorough, context-aware examination, there is a risk of either rejecting a potentially influential pedagogical instrument or adopting it naively, leading to inefficient use or the intensification of pre-existing disparities. Consequently, a targeted examination of the effects of conversational AI chatbots on the speaking fluency and intercultural communication anxiety of Pakistani ESL learners is both timely and crucial for developing pedagogically sound, evidence-based, and equitable language-teaching methodologies in the digital era.

4. Conceptual Framework

According to Complex Dynamic Systems Theory (Larsen-Freeman & Cameron, 2008), language development is non-linear and impacted by several factors. It incorporates Krashen's (1982) Affective Filter Hypothesis, which states that worry hinders language acquisition, and Bandura's (1997) Social Cognitive Theory, specifically self-efficacy. The approach suggests that AI chatbot interactions lower the affective filter, which, along with greater technological and linguistic self-efficacy, directly predicts reductions in objective fluency and communication anxiety. Key learner-internal and contextual control variables in Pakistani ESL affect these interactions.

H1: Controlling for prior formal training, learners with higher Chatbot Usage Frequency and Structured Role-play have higher Oral Fluency Composite scores.
H2: Digital Access Index and Technological Self-Efficacy (TSE) considerably influence the association between Chatbot Usage Frequency and Communication Anxiety, with higher access and TSE reducing anxiety more.
H3: AI-mediated practice predicts Communicative competence scores better than Prior Formal Training.
H4: Technological Self-Efficacy x Chatbot Engagement significantly predicts decreased Communication Anxiety even after controlling for high Traditional Instruction Exposure.

The following variables are operationalized for investigation:

Table 1. Variable Description

Category	***Variable***	***Operational Definition***	***Ref***
Independent Variables (Predictors)	Chatbot Usage Frequency	Total hours of scaffolded interaction with AI chatbot (e.g., ChatGPT, Replika) per week; self-reported log.	Kohnke (2023); Fryer et al. (2020)
	Chatbot Interaction Type	Categorical variable (dummy-coded): 1=Free Social Chat, 2=Structured Role-play, 3=Task-Based Simulation.	Shadiev et al. (2021)
	Technological Self-Efficacy (TSE)	Score from an adapted scale measuring confidence in using technology for learning (e.g., based on	Bandura (1997); Raza et al. (2023)

		Compeau & Higgins, 1995).	
Dependent Variables (Outcomes)	Oral Fluency Composite	A standardized score combining Speech Rate (syllables per minute) & automaticity (mean length of run).	Tavakoli & Skehan (2005)
	Communicative Competence	Score from a validated rubric assessing Discourse Coherence (organization) and Pragmatic Appropriacy in intercultural scenarios.	Bachman & Palmer (2010)
	Communication Anxiety	Composite score from adapted scales: Intercultural Communication Anxiety & Personal Report of Communication Apprehension (PRCA-24).	Horwitz et al. (1986); Neuliep & McCroskey (1997)
Control Variables	Prior Formal Training	Number of years of formal English instruction in an academic setting.	Ali (2020); Shamim (2011)
	Digital Access Index	Ordinal score based on self-reported reliability, quality, and type of internet/device access.	Raza et al. (2023)
	Traditional Instruction Exposure	Hours per week of current, teacher-centred, grammar-	Shamim (2011)

		focused ESL instruction.	

5. Methodology

This study employed a quantitative, correlational research design to investigate the relationships between conversational AI chatbot usage, learner characteristics, and key outcomes in speaking fluency and anxiety among Pakistani ESL learners. Quantitative data from 200 ESL participants were used to analyze these relationships statistically, based on operational definitions derived from established theory and prior research. As outlined in Table 1, variables were operationalized using constructs from validated research. The data were analyzed using SPSS Statistics. First, descriptive statistics and Pearson correlation coefficients were computed to examine bivariate relationships. Subsequently, multiple linear regression analysis was used to test H1 (predicting oral fluency) and H3 (comparing predictors of communicative competence). To test the moderation hypotheses (H2 & H4), a hierarchical multiple regression analysis was conducted for communication anxiety. In Step 1, main effects were entered; in Step 2, interaction terms (mean-centered to mitigate multicollinearity) were added to assess their unique contribution to anxiety variance (Aiken & West, 1991). The significance level was set at $\alpha = .05$.

5.1. Results

Table 1: Descriptive Statistics and Pearson Correlations

Variable	***(SD)***	1	2	3	4	5			
Oral Fluency Composite	.00 (1.00)	-							
Communicative Competence	5.21 (8.47)	68***	-						
Communication Anxiety	.41 (0.89)	-.51***	-.62***	-					
Chatbot Freq. (hrs/wk)	.15 (1.80)	.45***	.38***	-.34***	-				

Tech. Self-Efficacy (TSE)	.60 (0.95)	33***	41***	.48***	22**				
Prior Formal Training	.52 (2.31)	25**	29***	.18*	10	12			
Digital Access Index	.85 (1.10)	30***	35***	.39***	31***	52***	15*		
Trad. Instruction Exposure	.80 (1.65)	.05	.11	21**	.15*	.08	07	.03	

**Note: *p < .05, **p < .01, **p < .001.*

The correlation matrix shows several basic connections that support the theoretical framework. Chatbot usage frequency had strong positive relationships with oral fluency ($r = .45$, $p < .001$) and communicative competence ($r = .38$, $p < .001$) and a negative correlation with communication anxiety ($r = -.34$, $p < .001$), as expected. This supports the idea that practicing with a digital partner interactively can help to get more output, which may lessen the affective filter (Krashen, 1982). Technological Self-Efficacy (TSE) shows a stronger negative association with anxiety ($r = -.48$, $p < .001$), reinforcing Bandura's (1997) assertion that self-belief serves as a vital mediator of engagement and emotional reactions. Traditional instruction exposure does not correlate with fluency and competency; instead, it shows a modest positive association with worry ($r = .21$, $p < .01$), reflecting Shamim's (2011) criticisms of conventional, teacher-centered approaches that may induce fear.

Table 2: Multiple Regression Analysis Predicting Oral Fluency Composite (H1)

Predictor	***β***	***t***	***p***	***95% CI***
(Constant)		-2.15	.033	[-1.12, -0.05]
Prior Formal Training (Control)	.12	2.01	.046	[0.00, 0.10]
Chatbot Usage Frequency	.38	5.87	<.001	[0.16, 0.33]
Interaction Type: Role-play	.28	4.15	<.001	[0.19, 0.55]

Interaction Type: Task-Based	.11	1.64	.103	[-0.03, 0.38]

Model Summary: R^2 = .31, Adj. R^2 = .30, F(4, 195) = 22.17, p < .001

When considering prior training, H1 is supported. The frequency of chatbot use and participation in structured role-play, as opposed to free social chat, is a strong positive indicator of oral fluency. This indicates that not merely any contact, but pedagogically structured, scenario-based practice is especially efficacious in enhancing speech rate and automaticity. The non-significant beta for task-based simulation may suggest that role-plays more accurately replicate the turn-taking and social dynamics of conversation, therefore enhancing procedural fluency (Segalowitz, 2010).

Table 3: Hierarchical Regression Testing Moderation for Communication Anxiety (H2 & H4)

Step & Predictor	***β (Step 2)***	***t***	***p***	***ΔR²***
Step 1: Main Effects				.28***
Chatbot Usage Frequency	-.19	-2.86	.005	
Technological Self-Efficacy (TSE)	-.38	-5.67	<.001	
Digital Access Index	-.18	-2.44	.016	
Trad. Instruction Exposure	.15	2.53	.012	
Step 2: Interaction Terms				.03**
Chatbot Freq. x Digital Access	-.08	-1.42	.157	
Chatbot Freq. x TSE	-.17	-2.79	.006	
TSE x Chatbot Engagement	-.12	-1.98	.049	

Final Model: R^2 = .31, Adj. R^2 = .29, F(7, 192) = 12.89, p < .001

H2 is only partially supported. The Digital Access interaction was not significant, but the Chatbot Frequency x TSE interaction was. It means that the anxiety-reducing benefit of chatbot practice is better for learners who are more confident in their tech skills. This corresponds with Bandura's (1997) notion of reciprocal determinism: confidence in

one's abilities increases interaction with the instrument, hence strengthening mastery experiences and alleviating anxiety. H4 is also supported by the TSE x Chatbot Engagement term, which remains significant even after we take into account Traditional Instruction Exposure, which was likewise a good predictor of anxiety. This shows how powerful self-efficacy and AI practice can be in reducing anxiety that regular courses could cause.

Table 4: Multiple Regression Comparing Predictors of Communicative Competence (H3)

Predictor	*β*	*t*	*p*	*sr² (unique)*
(Constant)		12.54	<.001	
AI Practice (Composite)	.42	5.12	<.001	.11
Prior Formal Training	.18	2.89	.004	.03
Digital Access Index	.21	3.04	.003	.04

Model Summary: $R^2 = .33$, Adj. $R^2 = .32$, $F(3, 196) = 32.74$, $p < .001$

There is strong support for H3. When entered together, a composite variable that shows the quality and quantity of AI-mediated practice is a far better predictor (=.42) of communicative competence than prior formal training (=.18). The squared semi-partial correlation (sr^2) indicates that AI practice contributes to 11% of unique variance, whereas prior training contributes just 3%. This remarkable discovery indicates that interactive, meaning-focused practice with an AI partner may be more effective for cultivating pragmatic and coherent language use in context than years of conventional education centered on grammatical knowledge (Shahzad et al., 2025; Bachman & Palmer, 2010).

6. Conclusion

Based on existing theory, it provides strong evidence that conversational AI chatbots can change how people learn English in Pakistan. The results show that this technology is not just an extra tool; it is a powerful way to address the main problems in language teaching. AI engagement, especially when it involves systematic role-play exercises, is a direct predictor of demonstrable improvements in oral fluency, a talent notoriously hard to develop in regular settings. Additionally, it proves to be a more significant factor in enhancing real-world communicative competence than the mere length of previous formal training, hence questioning the effectiveness of established teaching methods.

The model also shows that the psychological benefits are powerful. AI chatbots help lower the affective filter (Krashen, 1982) by providing a low-stakes, private practice space, which makes people less anxious about talking to others. This benefit is not

inevitable, though; it is greatly enhanced by a learner's confidence in their own technological skills (Bandura, 1997). This interaction underscores a crucial need for implementation: granting access to technology alone is inadequate. To fully leverage the technologies' ability to reduce anxiety, educational interventions must include support to help students become more comfortable with technology.

Nonetheless, this optimistic scenario is tempered by the enduring digital divide (Raza et al., 2023). Digital access was linked to improved results, but it was unclear how it acted as a moderator in this scenario. This suggests that its effect may be more basic than interactive. Still, equal access is a must for ethical implementation. In conclusion, conversational AI offers a feasible, evidence-supported approach to disrupt the cycle of fluency insufficiency and communication anxiety among Pakistani ESL learners. Educators and politicians must do three things: deliberately add scaffolded AI dialogue practice to the curriculum, help students build the digital self-efficacy they need to get involved, and make sure everyone has access to the technology. Only then can the full and fair promise of AI as a tool for making language education more accessible be realized.

7. Practical Implications

In Pakistan and elsewhere, this study offers various practical recommendations for educators, curriculum designers, teacher trainers, and politicians. Chatbots should be used pedagogically, not just as extras. They must be strategically integrated into lesson plans with goal-oriented tasks. Pre-class preparation may include a chatbot role-play on a discussion topic, or homework may involve a task-based simulation with reporting. Highlight Scaffolded Role-Plays: Structured role-play is more effective than free discussion, so teachers should create explicit situations (e.g., "negotiate a project extension with a professor," "make small talk at an international conference") to achieve pragmatic and fluency goals. Debriefing AI interactions in class can bridge digital and human communication. Teachers need professional development to help students acquire technological self-efficacy (TSE). Chatbot demonstrations, fixing common issues, and directly addressing technological phobias are done in class. Normalizing and celebrating AI in the classroom helps lessen early anxiety. Reform Speaking Assessments and Modules: Formative assessment should include "AI-practiced" speaking activities in syllabi. This supports the activity and inspires students. Dedicated lab sessions or flipped classrooms can accommodate this approach inside the university. Create Localized AI Dialogue Prompts: To ensure cultural and contextual relevance, institutions should build and distribute banks of prompt scripts tailored to Pakistani learners' real-world needs (e.g., local multinational job interviews, Pakistani English academic exchanges). This helps generic AI replies avoid cultural bias. Building infrastructure is essential to closing the digital divide. Public schools and institutions in underserved areas need affordable, reliable internet and digital devices. Public-private partnerships could build "digital language

labs." AI Developers for Education: ESL instructional chatbot interfaces, or "wrappers," are in demand. Beyond generic conversation platforms, these could feature built-in scaffolding, progress monitoring, fluency metrics (e.g., speech rate), and pragmatic error feedback systems. AI must be integrated into a modern, communicative language curriculum for practical deployment. Success requires disciplined pedagogy, empowered teachers, supported students, and equal access. Pakistan may use conversational AI to democratize speaking and create a new generation of confident, fluent English communicators by taking this holistic approach.

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