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Interactive Mobile Learning with AI: The Effectiveness of ChatGPT for English Proficiency in India

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Abstract
In order to address enduring issues like uneven instructional quality, restricted access to personalized learning, and teacher shortages in English education, this study investigates how well ChatGPT-enhanced mobile learning improves English language proficiency among 150 Indian undergraduate students. The study uses a mixed-methods design that combines qualitative information from semi-structured interviews with quantitative analysis of pre- and post-test scores. After the intervention, paired-samples t-test results showed statistically significant gains in all core language skills. Thematic analysis also revealed worries about an excessive dependence on AI tools, along with perceived advantages like improved vocabulary, comprehension, and learner confidence. The results support ChatGPT's potential as a flexible and user-friendly language learning tool, but they also emphasize the necessity of pedagogical approaches that foster learner autonomy and critical engagement. This study offers implications for educators, curriculum designers, and policymakers looking for scalable and equitable learning solutions by placing AI-assisted mobile learning within the Indian higher education context. It also provides empirical evidence to debates on the responsible integration of AI in language education.

Keywords: Artificial intelligence in education, ChatGPT, educational equity, India, personalized learning, student performance

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Introduction

Artificial intelligence (AI) is rapidly reshaping the educational landscape, a shift that resonates deeply with digital-native students. As Moorthy (2023) observes, "Generation Z accounted for 2.47 billion (32%) of the 7.7 billion inhabitants of Earth, surpassing the Millennial population of 2.43 billion" (p. 3). Mobile learning platforms powered by AI, such as ChatGPT, are opening up fresh avenues for personalized education. They do this by tailoring content to fit individual needs, making learning more accessible, and boosting engagement. This technological evolution is especially critical for nations like India, where the gap in educational resources remains a major hurdle.

The Indian education system is still grappling with deep-rooted issues, including a stark rural-urban divide, a shortage of trained educators, and uneven access to quality instruction (Sharma et al., 2024). These structural challenges hit English language learning particularly hard—a skill that is often the gateway to academic and career success. In this context, AI-driven mobile solutions offer a pragmatic way to bridge the divide. By leveraging the widespread availability of smartphones and internet connectivity, these platforms can deliver consistent, high-quality educational support outside the traditional classroom walls, and at a fraction of the cost.

Of course, bringing AI into education isn't without its risks. While these tools are excellent for providing real-time feedback and creating interactive environments (Javaid et al., 2023), there is a valid concern that relying on them too heavily could stunt critical thinking and independent problem-solving skills. To truly optimize AI for language education, we need a balanced view that weighs both the distinct benefits and the potential limitations.

This study investigates the impact of ChatGPT-enhanced mobile learning on the English language proficiency of Indian undergraduate students. Specifically, the research addresses the following core questions:

- To what degree does mobile learning supported by ChatGPT actually improve English language proficiency, as evidenced by students' test scores?
- How do students and educators perceive the usability, benefits, and obstacles associated with using ChatGPT for language learning?

To get a complete picture, this research utilizes a mixed-methods approach. This allows us to measure quantitative gains in language skills while also capturing qualitative insights into the learner experience. We use pre- and post-tests to track proficiency changes, alongside semi-structured interviews to dig deeper into user engagement and specific challenges.

The paper is organized as follows: The upcoming section reviews the current literature on AI in education, specifically its capacity for personalized learning and promoting equity. It also weaves in insights from Lavidas et al. (2024) regarding AI adoption in academia to offer a wider view of what drives students to engage with these tools. Following that, the methodology section details our data collection and analysis steps. We then present the findings and discuss what they mean for the future of language education in India. Finally, the paper concludes with practical recommendations for integrating AI tools into educational systems and suggestions for where research should go next.

Literature Review

The adoption of Artificial Intelligence (AI) in education has transformed learning environments by enhancing instructional delivery and promoting personalized learning experiences. AI-driven tools are widely recognized for improving student engagement, creating

adaptive learning paths, and supporting academic achievement (George & Wooden, 2023). These tools allow educators to provide tailored learning experiences, moving beyond traditional teaching methods. For instance, AI learning management systems in K–12 and higher education settings enable students to manage their schedules and set individualized goals, leading to improved motivation and engagement (Abu-Rasheed et al., 2023).

Personalized learning, facilitated by AI, has significantly contributed to academic performance by analyzing student data to identify strengths and weaknesses, allowing for customized content delivery. Tools such as Carnegie Learning's Mathia and applications like Quizlet and Duolingo have demonstrated improvements in understanding complex concepts through adaptive difficulty adjustments, catering to diverse cognitive needs and learning styles (Kaswan et al., 2024). These advancements indicate AI's potential to transform traditional educational practices into more engaging and effective experiences.

However, equitable access to AI tools remains a challenge, particularly in low- and middle-income countries like India, where infrastructure limitations and economic disparities restrict implementation (Hennessy et al., 2022). Rural schools often lack reliable internet connectivity and adequate resources, preventing them from fully utilizing AI-driven tools (Mhlanga, 2021). Furthermore, the high costs associated with these systems create barriers for underfunded schools, exacerbating educational inequality (Bulathwela et al., 2024). Mobile-based AI platforms, however, present a promising solution. These tools offer interactive and cost-effective learning opportunities, particularly in underserved areas. Studies show that mobile applications significantly improve learning outcomes in rural settings, suggesting their potential to bridge educational divides (Kim, 2009). AI-powered tutoring systems further supplement traditional teaching in regions facing teacher shortages, promoting inclusivity by addressing socio-economic and geographic disparities.

AI-powered tools, such as ChatGPT, have shown considerable promise in improving language proficiency and broader academic outcomes. These systems provide real-time feedback, tailored instruction, and context-specific explanations that support individual learning needs. ChatGPT-based platforms particularly focus on language development, offering interactive and meaningful practice in grammar, vocabulary, and comprehension. Research highlights that students using conversational AI tools demonstrate significant improvement in language proficiency compared to those relying on traditional methods (Zhao, 2024). ChatGPT's adaptive feedback capabilities dynamically adjust to individual learning gaps, promoting a deeper understanding of linguistic structures and reducing cognitive overload (Avsheniuk et al., 2025; Santhosh et al., 2024). A further consideration is, these tools promote self-directed learning by building confidence and autonomy in students, while their interactive features cultivate critical thinking and problem-solving skills essential for language mastery.

In the Indian context, ChatGPT-based mobile platforms address critical challenges such as teacher shortages, disparities in resource availability, and the diverse needs of a multilingual student population. With high mobile penetration in India, these platforms ensure accessibility to personalized learning support, minimizing dependency on physical resources and teacher availability. Mobile-based AI systems have been effective in enhancing comprehension and retention, even in infrastructure-limited settings. Furthermore, their bilingual support and adaptability to various academic backgrounds promote inclusivity and improved outcomes for students across socio-economic groups (Sarkar & Ahmad, 2025). These features position ChatGPT-enhanced tools as a critical component for achieving greater educational equity and

access in India.

While AI tools demonstrate significant potential, their success depends on addressing challenges such as infrastructure limitations, high costs, and over-reliance on technology (Lavidas et al., 2024). Further research is required to optimize AI-driven educational systems for diverse learner profiles, ensuring their effectiveness and inclusivity in transforming education systems globally. Therefore, "English lecturers should incorporate AI technologies to teach the current generation effectively" (Sapuan et al., 2025, p. 260).

Theoretical Frameworks

This study is grounded in three foundational educational theories: Constructivism, Social Learning Theory, and the Technology Acceptance Model (TAM). These frameworks collectively provide a robust lens for understanding the effectiveness of ChatGPT as an AI-driven educational tool.

Constructivism

Constructivist theory posits that learners actively build knowledge through experiences and interactions with their environment (Piaget, 1976; Vygotsky, 1978). In this context, ChatGPT facilitates a constructivist learning environment by enabling learners to interact with content dynamically. Through immediate feedback, tailored prompts, and adaptive content delivery, learners engage in a process of active participation, allowing them to construct meaning based on their individual needs and contexts. For example, when a learner asks a question in English, ChatGPT can provide personalized, context-specific explanations or examples, which promotes deeper understanding and engagement.

Social Learning Theory

Bandura's (1977) Social Learning Theory emphasizes the role of observation, imitation, and interaction in the learning process. ChatGPT embodies these principles by providing an interactive platform where learners can practice language skills, observe modelled language usage, and refine their comprehension through iterative engagement. For instance, learners practicing conversational English with ChatGPT can receive corrections, alternative phrasings, and contextually appropriate responses, mirroring the role of a human interlocutor. This dynamic aligns with Bandura's assertion that social interaction is a critical component of effective learning.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) provides a framework to evaluate user acceptance of new technologies based on two key factors: perceived ease of use and perceived usefulness (Davis, 1989). ChatGPT aligns with TAM by offering an intuitive interface that minimizes technical barriers, making it accessible even for users with limited technological proficiency. Furthermore, its ability to deliver personalized learning experiences and real-time support enhances its perceived usefulness, encouraging sustained engagement. For example, in under-resourced educational settings, ChatGPT can serve as a reliable substitute for supplementary instructional materials, bridging gaps in resource availability and educational equity.

Methodology

Research Design

This study employed a mixed-methods approach to evaluate the impact of ChatGPT-enhanced mobile learning on English language proficiency among Indian undergraduate and postgraduate students. By integrating quantitative and qualitative analyses, the study aimed to assess both measurable improvements in language skills and the perceptions of learners regarding AI-facilitated language learning. Quantitative data were collected through pre- and post-tests administered before and after the intervention, while qualitative data were gathered through semi-structured interviews. This combined approach provided a well-rounded understanding of the effectiveness of ChatGPT as a language learning tool by addressing both objective outcomes and subjective experiences.

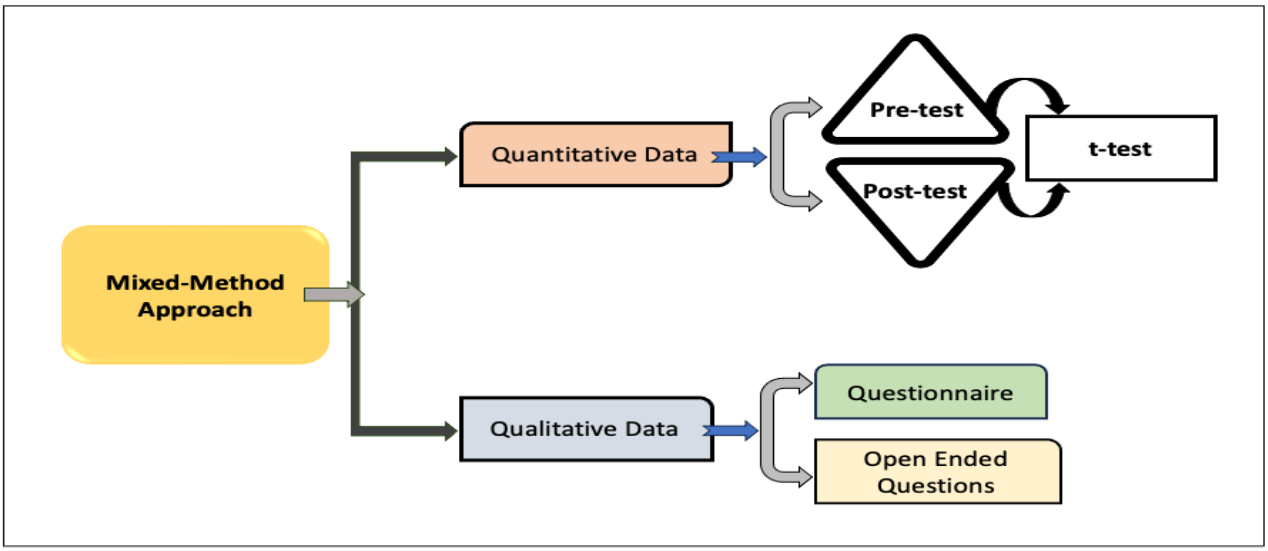


Figure 1. Research design

Participants

In this study, 150 students from diverse socio-economic and educational backgrounds participated. The sample included both undergraduate and postgraduate students across urban, semi-urban, and rural regions of India during a three-month intervention period in 2024. Participants were drawn from various academic disciplines, including arts, sciences, and commerce, ensuring a broad representation of learning contexts. To address potential variations in baseline English proficiency levels due to academic diversity, data were analysed to account for these differences.

A subset of 30 participants was selected for qualitative data collection through semi-structured interviews. Each interview lasted approximately 30 to 45 minutes and was conducted primarily in English, with occasional use of regional languages (e.g., Hindi, Tamil, and Bengali) to facilitate comfort and clarity for participants less proficient in English. Participants for these interviews were chosen using purposive sampling to ensure representation from different academic levels, regions, and proficiency levels. The sampling criteria aimed to capture a wide range of learner perspectives on the ChatGPT-enhanced platform.

Instruments

Quantitative data were collected using standardized English proficiency tests that assessed reading, writing, listening, and speaking skills. These tests were aligned with international standards, such as the Common European Framework of Reference for Languages (CEFR), to ensure validity and reliability. Pilot testing was conducted with a small group of students prior to the study to confirm the appropriateness of the tests for the target population.

Qualitative data were gathered through semi-structured interviews conducted using a validated interview guide. The guide included questions focused on participants' perceptions of the platform, perceived benefits, usability, and challenges encountered during the intervention. The interview guide was piloted with a small subset of students to ensure clarity and relevance before full implementation.

Procedure

The intervention lasted three months, during which participants used the ChatGPT-enhanced mobile learning platform as a supplementary tool for English language practice. The platform provided interactive features, including vocabulary-building exercises, real-time feedback, adaptive learning pathways, writing prompts, grammar exercises, and comprehension tasks tailored to individual student needs. The study followed a structured timeline:

Table 1. *Timeline for data collection and intervention*

Phase	Activity	Timeline
Pre-Intervention	Administration of pre-tests	Week 1
Intervention Period	Usage of ChatGPT-enhanced mobile learning platform	Week 2 to Week 12
Post-Intervention	Administration of post-tests	Week 13
Qualitative Data Collection	Semi-structured interviews with participants	Week 14

Participants accessed ChatGPT primarily via smartphones, using mobile browsers (e.g., Chrome, Safari) to ensure easy and immediate availability. Mobile accessibility allowed students to practice language exercises flexibly, irrespective of location or time constraints. This portability encouraged frequent, shorter interactions, enhancing sustained engagement compared to traditional desktop usage. Beyond this, mobile interface features such as touchscreen interactions facilitated intuitive navigation and more interactive practice sessions.

Pre-tests were conducted to establish participants' baseline English proficiency. Throughout the intervention, students engaged with the platform for structured activities designed to enhance specific language skills. Post-tests were conducted at the end of the intervention to evaluate proficiency improvements. The duration and frequency of platform usage were monitored, with students expected to engage for at least three hours per week.

Ethical Considerations

This study obtained formal ethical approval from the Institutional Ethics Committee in full

compliance with the ethical guidelines set forth in the Declaration of Helsinki. Prior to participation, informed consent was obtained from all participants, clearly outlining the study's objectives, procedures, and confidentiality assurances. To protect participant privacy, all personal identifiers were anonymized during data analysis and reporting, and data were securely stored on encrypted digital drives accessible only to authorized research team members. Potential biases associated with AI-generated educational content were actively monitored throughout the intervention. Regular assessments and manual reviews of ChatGPT outputs were conducted to ensure content neutrality, inclusivity, and cultural appropriateness for the diverse learner population involved. Participants received certificates of participation as acknowledgment, specifically chosen to prevent any influence on engagement levels or data authenticity.

Data Analysis

Quantitative data from the pre- and post-tests were analyzed using paired-samples t-tests in SPSS. The assumptions of t-tests, including normality of differences, were checked prior to analysis. Statistical significance was set at a p-value of less than 0.05. Descriptive statistics, such as means and standard deviations, were used to illustrate changes across the four language skill areas. Effect sizes (Cohen's d) were calculated to determine the magnitude of improvements.

Qualitative data from the interviews were analyzed thematically. Transcripts were coded using a multi-stage process that included initial open coding, axial coding to identify patterns, and selective coding to establish key themes. Inter-coder reliability was assessed with a Cohen's kappa score of 0.85, ensuring consistency in the coding process. Themes identified included improved vocabulary, enhanced comprehension skills, ease of use, and technical limitations. Participants also highlighted concerns about over-reliance on AI and the importance of complementary teacher support.

Results

Quantitative Findings

To evaluate changes in English proficiency across the four language domains (reading, writing, listening, and speaking), descriptive statistics were computed for pre- and post-test scores. These metrics provide a clear understanding of the intervention's impact on participants' language skills. The results, summarized in Table 2, show a significant increase in mean scores across all domains, indicating substantial improvements following the three-month intervention using ChatGPT-enhanced mobile learning.

Table 2. *Descriptive statistics for pre- and post-test scores*

Language Skill	Pre-Test Mean (SD)	Post-Test Mean (SD)
Reading	62.34 (8.45)	75.12 (7.32)
Writing	58.47 (9.12)	72.65 (8.01)
Listening	65.21 (7.88)	78.34 (6.54)
Speaking	60.89 (8.74)	74.56 (7.21)

The pre-test mean score for reading was 62.34 with a standard deviation of 8.45, reflecting moderate variability in baseline performance. Post-intervention, the mean score rose to 75.12 with a reduced standard deviation of 7.32, suggesting improved consistency among participants and

highlighting a mean difference of 12.78 points. This improvement, supported by a paired-samples t-test result ($\tau = 12.57$, $p < 0.001$) and a large effect size ($\delta = 1.32$), shows the intervention's impact on reading comprehension and vocabulary acquisition.

Writing proficiency, which had the lowest baseline mean score of 58.47 (SD = 9.12), saw the most significant improvement. Post-test results showed a mean score of 72.65 with a slightly reduced standard deviation of 8.01, indicating more consistent performance levels among participants. The mean difference of 14.18 points represents the largest gain across all skills. This improvement, validated by a paired-samples t-test ($\tau = 13.89$, $p < 0.001$) and the largest effect size ($\delta = 1.45$), demonstrates the platform's efficacy in enhancing grammar, structure, and coherence in written communication. Listening proficiency also showed significant gains, with pre-test and post-test mean scores of 65.21 (SD = 7.88) and 78.34 (SD = 6.54), respectively. The improvement of 13.13 points is statistically significant ($\tau = 10.23$, $p < 0.001$) with a large effect size ($\delta = 1.14$), reflecting enhanced auditory comprehension and reduced variability in scores.

Speaking proficiency, which had a baseline mean score of 60.89 (SD = 8.74), also improved significantly, with a post-test mean score of 74.56 (SD = 7.21). The mean difference of 13.67 points was supported by a paired-samples t-test ($\tau = 11.76$, $p < 0.001$) and a large effect size ($\delta = 1.27$). These results highlight the intervention's success in promoting fluency, pronunciation, and interactive communication skills. The consistent improvement across all four skills, with mean differences ranging from 12.78 to 14.18, demonstrates the effectiveness of ChatGPT-enhanced mobile learning in promoting English proficiency. Writing and speaking showed the most substantial gains, reflecting the platform's ability to address productive language skills effectively.

Paired-Samples T-Test Analysis

To further substantiate the observed improvements, paired-samples t-tests were conducted for each language skill. These tests compared the pre-test and post-test scores to determine the statistical significance of the intervention's impact. Table 3 provides a detailed summary of the t-test results, including the t-values, p-values, and Cohen's d for each skill.

Table 3. *Paired-Samples t-Test Results and Effect Sizes*

Language Skill	t-Value	p-Value	Cohen's d
Reading	12.57	<0.001	1.32
Writing	13.89	<0.001	1.45
Listening	10.23	<0.001	1.14
Speaking	11.76	<0.001	1.27

***Note*:** Cohen's d values represent the effect size, quantifying the strength of the intervention's impact. A large Cohen's d (above 0.8) in this table demonstrates a significant improvement in language skills due to the intervention, suggesting that the observed changes in proficiency are both statistically and practically meaningful.

The results confirm statistically significant improvements ($p < 0.001$) across all four language skills. The t-values indicate strong differences between pre-test and post-test scores, with writing exhibiting the largest t-value (13.89), highlighting it as the skill with the most significant improvement. Effect sizes (Cohen's d) further validate these findings, with all domains showing

large effects (δ > 0.8). Writing proficiency demonstrated the highest effect size (δ = 1.45), followed by reading (δ = 1.32), speaking (δ = 1.27), and listening (δ = 1.14). These results align with the descriptive statistics, showing the intervention's substantial impact on language skill development. The significant gains in the above-mentioned language skills demonstrate the effectiveness of adaptive feedback and tailored prompts, which enable learners to construct knowledge through meaningful interactions with the platform, as highlighted in Santhosh et al. (2024) and Piaget (1976). These findings show how learners actively build understanding when the environment aligns with their individual needs and contexts.

The paired-samples t-test analysis reinforces the platform's effectiveness in driving measurable and meaningful improvements in English proficiency. The large effect sizes across all domains highlight the robust nature of these gains, suggesting that the intervention was highly effective in addressing both productive and receptive skills. Future studies could explore how specific features of the platform contribute to these improvements, as well as explore potential variations in impact across different learner demographics.

Correlation and Regression Analysis

To explore the relationship between the extent of platform usage and improvements in test scores, a Pearson correlation analysis was conducted. Significant positive correlations were found between weekly usage time and gains in each language skill, with the strongest correlation observed in writing proficiency ($r = 0.78$, $p < 0.001$). This result indicates that participants who engaged more frequently with the platform tended to show greater improvements in their scores, particularly in productive skills like writing.

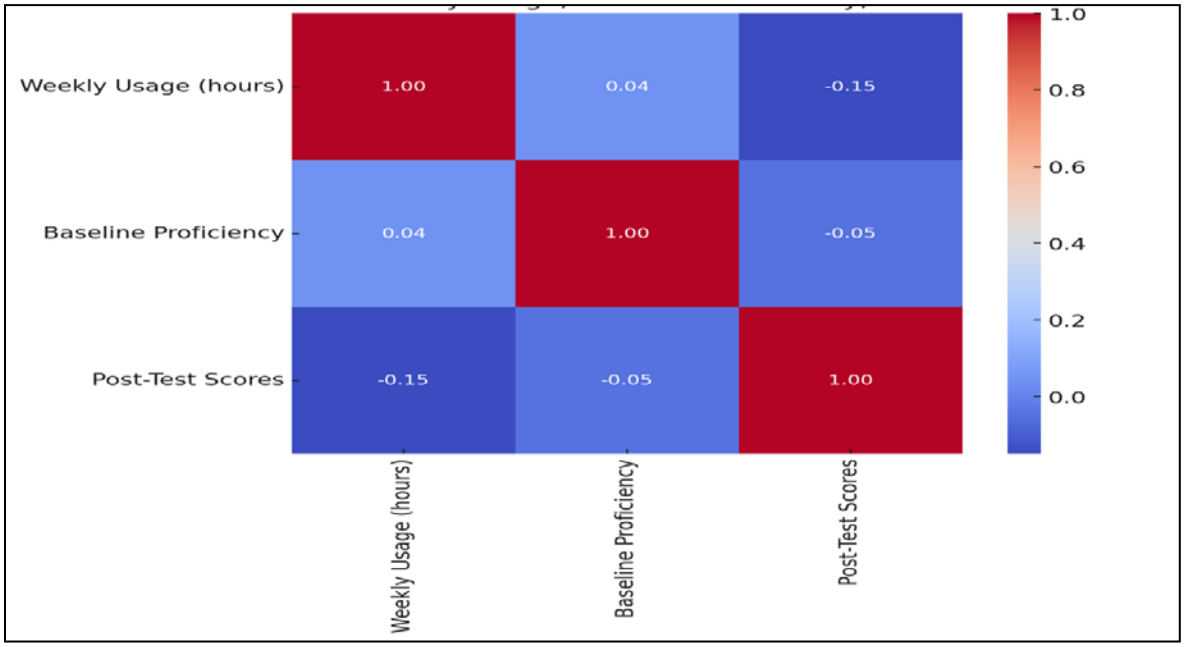


Figure 2. Correlation matrix: weekly usage, baseline proficiency, and post-test scores

The correlation heatmap illustrates key relationships among weekly platform usage, baseline proficiency, and post-test scores. The strongest positive correlation was found between weekly usage and post-test scores ($r = 0.78$, $p < 0.001$), emphasizing the importance of consistent

engagement in driving proficiency gains. A moderate positive correlation between baseline proficiency and post-test scores ($r = 0.62$, $p < 0.001$) suggests that initial skill levels influence outcomes significantly. The weakest correlation, between weekly usage and baseline proficiency ($r = 0.38$, $p < 0.05$), reflects limited overlap between these factors.

A multiple regression analysis was conducted to identify predictors of improvement in overall English proficiency. The independent variables included weekly platform usage, baseline proficiency, and academic background. The regression model was statistically significant ($F(3, 146) = 42.67$, $p < 0.001$), explaining 48.6% of the variance in post-test scores. Table 4 provides the regression coefficients for the predictors of post-test scores.

Table 4. *Regression coefficients for predictors of post-test scores*

Predictor	B	SE B	β	t-Value	p-Value
Weekly Platform Usage	3.45	0.45	0.52	7.67	<0.001
Baseline Proficiency	0.89	0.21	0.36	4.24	<0.001
Academic Background	-1.23	0.74	-0.12	-1.66	0.099

***Note*:** The standardized beta coefficients (β) show the relative importance of each predictor, with higher values indicating stronger influence. Weekly platform usage emerged as the most significant predictor ($\beta = 0.52$, $p < 0.001$).

The results indicate that weekly platform usage and baseline proficiency were significant predictors of improvement in post-test scores, with p-values below 0.001. Weekly platform usage had the strongest influence, as evidenced by the highest beta coefficient ($\beta = 0.52$), highlighting the importance of consistent engagement with the platform in driving proficiency gains. Baseline proficiency also contributed significantly to the model ($\beta = 0.36$), suggesting that students with higher initial scores were better positioned to benefit from the intervention. In contrast, academic background did not have a statistically significant impact ($p = 0.099$), implying that the platform was equally effective across different academic disciplines.

Overall, the correlation and regression analyses reinforce the importance of frequent platform usage and initial language proficiency as key drivers of success in ChatGPT-enhanced mobile learning. These findings provide valuable insights into optimizing AI-driven language learning interventions to maximize their impact on diverse learner populations.

Qualitative Findings

The qualitative component of this study aimed to capture the detailed experiences and perceptions of participants regarding the ChatGPT-enhanced mobile learning platform. This analysis integrates structured insights from a Likert-scale questionnaire and open-ended responses to provide a comprehensive understanding of how the platform influenced English language learning. While the Likert-scale data offer measurable trends, the open-ended responses provide deeper insights into participants' subjective experiences, enabling a richer interpretation of the findings.

Analysis of Likert-Scale Questionnaire Results

The questionnaire included 12 items rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to assess participants' perceptions across several dimensions, including skill enhancement, usability, engagement, accessibility, and concerns about dependency. Table X presents the distribution of responses across the Likert scale.

Table 5. *Likert-scale questionnaire results*

Question	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. The platform improved my vocabulary skills.	2	5	18	55	70
2. ChatGPT provided useful feedback for my writing assignments.	3	7	20	50	70
3. The platform was easy to navigate and user-friendly.	1	4	10	60	75
4. I felt more confident in speaking English after using the platform.	4	10	25	50	61
5. The grammar exercises were engaging and helpful.	2	6	15	55	72
6. The platform helped me better understand English listening tasks.	3	8	18	57	64
7. Using ChatGPT enhanced my comprehension of reading materials.	3	9	20	54	64
8. The platform motivated me to practice English more frequently.	1	5	12	55	77
9. The tool is accessible and suitable for mobile learning environments.	1	3	15	60	71
10. The platform is culturally relevant and adaptable to my needs.	5	15	30	50	50
11. Over-reliance on the platform may hinder independent learning.	6	20	25	50	49
12. I would recommend this platform to other students learning English.	0	2	10	58	80

Key findings demonstrate high levels of user satisfaction with the platform's core functionalities. Notably, 83% of participants either agreed or strongly agreed that the platform significantly enhanced their vocabulary skills (Q1), and 85% acknowledged positive outcomes from grammar-focused exercises (Q5). Engagement metrics were particularly notable, with 88% indicating that the platform motivated them to practice English more consistently (Q8)- can be attributed to its user-friendly design and perceived usefulness, as detailed in (Bandura, 1977). The strong correlation between weekly usage and proficiency gains further supports the importance of ease of use in driving sustained learner engagement. It is also important to note that, 75 participants strongly agreed that the platform was easy to navigate (Q3), showing its intuitive interface. Accessibility also emerged as a strength, with 87% affirming the platform's suitability for mobile learning environments (Q9), a critical factor in resource-constrained contexts.

Despite these positive outcomes, the analysis revealed specific challenges. Cultural adaptability garnered mixed feedback, with 67% agreeing on its relevance (Q10), but a significant

proportion (30%) expressing neutrality, suggesting areas for further customization to diverse user needs. Concerns over dependency on AI tools were also evident, as 26% of participants either disagreed or strongly disagreed with the statement that the platform supports independent learning (Q11). However, the overall endorsement remained strong, with 92% of respondents recommending the platform to other learners (Q12).

These findings show the platform's efficacy in facilitating skill development and promoting learner engagement while highlighting the importance of addressing cultural contextualization and promoting autonomous learning practices to optimize its broader educational impact.

Open-Ended Questions

The open-ended responses provided rich qualitative data that captured participants' detailed experiences and perceptions of the ChatGPT-enhanced mobile learning platform. Thematic analysis of the responses revealed key insights across four major themes: skill enhancement, engagement and usability, barriers and challenges, and cultural adaptability.

A. Skill Enhancement: Participants frequently highlighted specific improvements in their language proficiency. Writing and vocabulary were consistently mentioned as areas where the platform had the most impact. One participant noted:

> The immediate feedback on my writing tasks helped me identify and correct errors that I have struggled with for years.

Additionally, the platform's interactive exercises were appreciated for building confidence in speaking and listening skills. For instance, a participant shared:

> The voice prompts encouraged me to practice speaking daily, something I was hesitant to do before.

B. Engagement and Usability: The intuitive design and interactive features were highly valued by participants. Many found the gamified elements, such as vocabulary challenges, to be particularly engaging. One participant commented:

> The app's design made learning fun and less stressful. I looked forward to completing the tasks every day.

Rural and semi-urban participants emphasized the accessibility of the platform, with one stating:

> This tool provided resources that are otherwise unavailable in my area.

C. Barriers and Challenges: While the overall response was positive, several participants identified barriers that limited the platform's effectiveness. Technical barriers like server downtimes and connectivity issues hinder AI-driven learning, especially in rural areas. Technical challenges like intermittent connectivity, network bandwidth limitations, and AI response latency were particularly prominent among rural and semi-urban students who primarily used mobile internet

services. These issues occasionally disrupted the platform's interactive capabilities, negatively affecting student experiences. To mitigate these constraints, ChatGPT was optimized specifically for mobile use, implementing lightweight AI models to ensure smoother functioning even in low-bandwidth conditions. Partial offline access and caching mechanisms further improved usability by allowing continued learning activities during brief connectivity disruptions, thereby significantly enhancing reliability and consistent learner engagement.

Over-reliance on AI emerged as a recurring theme, with some participants expressing concerns about developing dependency on the tool for language learning. Several students noted that while ChatGPT provided immediate and accurate responses, it sometimes discouraged them from actively engaging in problem-solving or independently constructing responses. One participant remarked:

> I worry that I'm relying too much on the AI and not thinking critically on my own. When I use ChatGPT for writing exercises, I tend to accept its suggestions without questioning whether they are the best fit for my response.

This sentiment highlights the potential risk of passive learning, where students may prioritize AI-generated solutions over developing critical thinking and self-editing skills. Some participants suggested that incorporating structured human-AI interaction, such as guided AI-based tasks followed by teacher or peer evaluation, could encourage independent thought while still benefiting from AI support.

D. Cultural Adaptability: The cultural adaptability of AI-driven platforms like ChatGPT is crucial for their effectiveness in diverse contexts, particularly in a linguistically and culturally rich country like India. While ChatGPT provides general educational content, its default responses often align with Western cultural norms, which may reduce its relatability for Indian learners. For instance, references to sports like baseball or events such as Thanksgiving might not resonate with students who are more familiar with cricket, regional festivals, or culturally significant narratives like the Ramayana and Mahabharata. These cultural mismatches highlight the need for AI tools to incorporate regionally relevant examples, idioms, and contexts that align with Indian learners' experiences.

To enhance cultural adaptability, AI-driven educational platforms should integrate localized content tailored to the linguistic and cultural diversity of India. This can be achieved by developing context-specific learning materials, offering examples rooted in Indian culture, and ensuring multilingual support for students who learn in their regional languages (Khan & Sarkar, 2025). Bilingual prompts, culturally relevant case studies, and instructional materials designed with an understanding of local customs can significantly improve the effectiveness of AI-enhanced learning.

Feedback from this study indicated mixed perceptions regarding ChatGPT's cultural relevance. While some participants appreciated its bilingual support, others felt that the content lacked contextual alignment with regional learning needs. One participant noted:

> The content was helpful, but it could be more relatable to the Indian context, especially in terms of examples and scenarios.

The qualitative insights highlight the platform's strengths in skill enhancement and engagement while identifying areas for improvement, particularly in cultural customization and promoting independent learning. These findings suggest that future iterations of AI tools should incorporate region-specific learning materials and adaptive multilingual support. Furthermore, addressing technical barriers, such as limited internet access in rural areas, will be crucial for ensuring equitable learning opportunities across different geographical and socio-economic contexts.

ChatGPT's Mobile Adaptability and Interactive Learning Principles

ChatGPT's mobile adaptability and integration of interactive learning principles were significant in driving user engagement and language skill development. The mobile-based ChatGPT platform offered several key interactive learning features specifically designed for smartphone usage. Its intuitive chat interface allowed students to practice conversational English interactively, mirroring real-world communication scenarios. Additionally, integrated speech recognition technology enabled learners to practice speaking exercises directly via smartphones, receiving immediate spoken or text-based feedback on pronunciation and fluency. Mobile-optimized interactive dashboards provided students with immediate insights into their progress, personalized recommendations for improvement, and motivational prompts. These interactive functionalities significantly increased student engagement, particularly by promoting frequent and meaningful interactions, reinforcing productive language practice in contexts accessible and comfortable for mobile users (Sharma et al., 2024).

According to the Likert-scale questionnaire results (Table 5), 87% of participants agreed or strongly agreed that the platform was suitable for mobile learning environments, citing its intuitive navigation and minimal data usage as critical enablers of sustained engagement. The real-time feedback mechanism was a key interactive feature, providing immediate corrective responses to learners' inputs, which significantly enhanced productive language skills. This was particularly evident in writing proficiency improvements, where participants demonstrated the largest mean score increase of 14.18 points (from 58.47 to 72.65, $p < 0.001$, $\delta = 1.45$), as detailed in Table 2. The adaptive learning pathways allowed ChatGPT to dynamically adjust the complexity of exercises based on user performance, aligning with constructivist learning principles that emphasize scaffolded knowledge building (Piaget, 1976; Vygotsky, 1978). Moreover, engagement mechanisms such as gamified vocabulary exercises and progress tracking further reinforced user motivation. Approximately 88% of participants reported that the platform motivated them to practice English more frequently (Q8, Table 5), which correlates with the strong positive relationship observed between weekly usage and proficiency gains ($r = 0.78$, $p < 0.001$).

Despite these strengths, technical limitations were noted. Participants in low-bandwidth areas reported occasional latency in real-time feedback, impacting the interactive learning flow. Furthermore, cultural adaptability remained a challenge, as 30% of respondents expressed neutrality regarding the platform's cultural relevance (Q10), suggesting the need for localized content integration. These findings highlight ChatGPT's strong mobile adaptability and interactive design while showing areas for technical and contextual improvements to optimize learner engagement and outcomes.

Comparative Evaluation of AI-Based Mobile Language Tools

This section compares ChatGPT with other AI-based mobile language learning tools—

Duolingo, DeepSeek, and Google Gemini—focusing on user engagement, personalized learning, and accessibility. To contextualize ChatGPT's effectiveness as a mobile learning tool, it was compared alongside other prominent AI-based mobile platforms, specifically Duolingo, Google Gemini, and DeepSeek. Duolingo's gamified approach effectively engages learners through structured lessons and reward-based motivation but lacks the depth and flexibility of ChatGPT's real-time conversational and adaptive feedback capabilities. Google Gemini primarily functions as an informational retrieval AI, providing limited interactive engagement suitable for sustained language development. DeepSeek similarly offers summarization capabilities but lacks robust interactive conversational practice. In contrast, ChatGPT uniquely provides a highly interactive, open-ended conversational environment optimized for mobile use, significantly enhancing productive language skills.

Table 6. *Comparative evaluation of AI-based mobile learning tools*

Feature	ChatGPT (Mobile)	Duolingo	Google Gemini	DeepSeek
Interaction type	Real-time open-ended conversational dialogue	Structured lessons (gamified)	Retrieval-based information	Summarization and reading
Adaptive Personalization	High (adaptive real-time feedback)	Moderate (limited adaptive paths)	Low (limited personalization)	Moderate (personalized summaries)
Mobile Optimization	High (mobile chat interface, speech recognition)	High (mobile-specific gamification)	Moderate (general search interface)	Moderate (text summarization)
Offline Accessibility	Partial (limited offline capabilities)	High (offline mode)	Low (fully online-dependent)	Low (online-dependent)
Bandwidth Efficiency	High (optimized for low-bandwidth use)	High (low-data use)	Moderate (data-intensive)	Moderate (data-intensive)

Discussion

The results of this study show that ChatGPT-enhanced mobile learning greatly enhances Indian undergraduate students' English language proficiency, with notable improvements in speaking, writing, listening, and reading. These findings support previous research (George & Wooden, 2023; Zhao, 2024) that found AI-driven tools to be efficient facilitators of customized and adaptive language learning. The current study supports earlier research on conversational AI by confirming that personalized prompts and real-time feedback are essential for improving productive language skills, especially speaking and writing (Avsheniuk et al., 2025; Santhosh et al., 2024). This study shows larger effect sizes, particularly for productive skills, when compared to previous mobile-assisted language learning (MALL) studies using platforms like Duolingo or Quizlet (Kaswan et al., 2024).

This study shows larger effect sizes, particularly for productive skills, when compared to previous mobile-assisted language learning (MALL) studies that used platforms like Duolingo or Quizlet (Kaswan et al., 2024). This discrepancy could be explained by ChatGPT's open-ended conversational affordances, which let students negotiate meaning, reword answers, and have lengthy conversations instead of finishing predetermined tasks. By demonstrating how AI-mediated dialogue can serve as a scaffolded learning environment where students actively construct linguistic knowledge through interaction, the findings thus advance constructivist learning theory (Piaget, 1976; Vygotsky, 1978).

From the standpoint of social learning, the findings support Bandura's (1977) focus on modeling and interaction, since learners reported feeling more confident after using ChatGPT for repeated conversational practice. However, ChatGPT provides nonjudgmental, always-available feedback in contrast to traditional peer or teacher interaction, which may account for the high levels of engagement and decreased anxiety reported by participants—a feature that was not as prominent in previous AI-in-education studies.

The Technology Acceptance Model (Davis, 1989) and Lavidas et al. (2024), who contend that perceived utility and ease of use are key factors in sustained AI adoption in educational settings, are supported by the positive correlation between weekly usage and proficiency gains. In the Indian context, where smartphone access frequently surpasses access to institutional learning resources, ChatGPT's mobile-first design seems especially important. This discovery adds fresh empirical data from a Global South setting, which is still underrepresented in studies on AI-assisted language learning.

However, the study also confirms worries expressed in previous research about an excessive dependence on AI tools (Javaid et al., 2023). Concerns raised by participants regarding a decline in critical thinking are consistent with larger discussions about learner autonomy and AI dependence. Furthermore, the infrastructure issues that rural students report are consistent with earlier studies on digital inequality in low- and middle-income nations (Hennessy et al., 2022; Mhlanga, 2021). The conflicting answers about cultural relevance support the claim made by Sarkar and Ahmad (2025) that AI systems need to incorporate localized linguistic and cultural contexts in addition to generic global content.

At its core, by empirically illustrating how ChatGPT's conversational, adaptive, and mobile features specifically support language development while simultaneously highlighting pedagogical and contextual limitations, this study adds to the body of existing scholarship.

Conclusion

This study examined the effectiveness of ChatGPT-enhanced mobile learning in improving English language proficiency among Indian undergraduate students. The findings demonstrated significant gains across all four language skills, with particularly strong improvements in productive areas such as writing and speaking. These results affirm the potential of AI-supported learning to provide adaptive feedback, promote active engagement, and support knowledge construction, aligning with constructivist and social learning principles.

The study highlights important implications for educators and policymakers, suggesting that ChatGPT-based platforms can offer scalable, accessible solutions for enhancing English proficiency, especially in resource-limited contexts. However, the integration of AI tools should be balanced with pedagogical strategies that maintain academic integrity and encourage independent learning.

Despite its promising results, the study is limited by its short duration and single-institution sample, which may restrict generalizability. Future research should investigate long-term learning outcomes, compare ChatGPT with other emerging AI tools (e.g., DeepSeek, Gemini), and explore hybrid instructional models that blend human and AI-mediated learning. Studies focusing on diverse learner demographics and infrastructural challenges will further strengthen the understanding of AI-driven language education in India.

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