

Using an AI Chatbot to Improve Iraqi EFL Students' Engagement and English Proficiency

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Abstract

Chatbots offer a unique way to teach language through interactive interaction in an age where digital technologies are increasingly important in education. This study used chatbots to promote Iraqi EFL student engagement and interactive communication in English language instruction. The research paper examined how chatbot interactions can improve communication by engaging a random group of university English students. Pre- and post-implementation examinations have measured students' speaking skills in various tasks. The investigation used sophisticated analytical methods, including *t*-tests, to identify fluency, pronunciation, intonation, and stress pattern improvements. A mixed-methods approach was employed to survey learners about chatbots in their learning. Chatbots were used throughout the course to provide students with rapid feedback on spoken activities. Iraqi Students' speaking skills improved, particularly intonation and fluency. Although pronunciation did not differ according to proficiency level, interactive speaking activities improved significantly. The findings suggest that chatbot technology could improve English language learners' engagement and communication skills. This study stresses the need for more research into unique educational tools that aid language acquisition in different learning environments.

Keywords: English Language Learning, Chatbots, Technology-Enhanced Pedagogy, Ai In Education, Natural Language Processing (NLP)

Introduction

One of the most revolutionary new tools for language learning is chatbot technology, which lets students talk to artificial intelligence (AI). (Ait Bt et al., 2024) Chatbots can help students in Iraq, where English is often taught as a foreign language, practice speaking without the stress of talking to someone in person. This makes them more likely to speak correctly and rapidly. As communicative competence becomes more important in English language learning in Iraq, it is important to study how technology affects speaking proficiency outcomes. (Alamer et al., 2023) The learning environment also plays a role in shaping students' experiences and outcomes. Chatbots provide a resource-rich environment that is good for practicing and learning a language in Iraq, where educational resources are limited. (Chen et al., 2023) Peer interaction and instructor support are two things that can affect the overall quality of the learning environment.

To improve speaking skills, you need to know how these things work together to make the best use of educational methods. (Chiu et al., 2023)

Support from teachers is also very important for ELL in Iraq. Positive feedback and personalised instruction from teachers have made a big difference in how well students learn. (Dewi et al., 2022) Figure 1 shows how chatbot technology makes ELL better by taking user input, using natural language processing (NLP) to understand questions, and coming up with answers while also using learning analytics to track student progress and improvement. When teachers talk to students and give them constructive criticism, it helps them better understand the strange ways in which language is used. This helps students improve their speaking skills and become more confident in their ability to speak the language. (Ebadi et al., 2024) Also, the amount of time spent studying is very important for how well you learn.

There is much evidence that practice time helps people learn a language. (Fathi et al., 2024) More time spent studying lets students practice speaking more deeply, which usually makes them more fluent and confident. In Iraq, where students may not have many opportunities to practice English outside of school, chatbots can give them more practice time, which can help them improve their skills. (GC et al., 2024) To develop good ways to learn a language, one must know how these basic parts are connected. The effects of student engagement as a mediator make things even more complicated. (Hew et al., 2023) When students are really interested in what they're learning, they have more chances to practice, which helps them get better at language. A lively interaction between chatbot technology, the learning environment, teacher support, and study time shows that ELL is a complete and essential part of the learning process. (Ait Bt et al., 2024)^o As Iraq's education system changes, the link between chatbot technologies and learning outcomes gives us useful information on how to make ELL experiences better for students. (Ait Bt et al., 2024)

The chatbot used in this study had advanced NLP features that let it quickly understand and respond to what students said. The chatbot provided personalised feedback and assistance by pretending to have conversations with people. It focused

on common speaking problems like fluency, pronunciation, intonation, and stress patterns. The chatbot also added game-like elements to increase students' interest and motivation, which made the learning process more fun and effective.

This study aims to investigate how using chatbots in ELL in Iraq helps students learn, communicate, and improve their speaking skills in different types of classrooms.

Literature Review

There has been much discussion about using chatbots in education, and studies have shown that they can help with setting goals and being present in social situations when doing things online. Chatbots can help students in Iraq who are taking online courses set goals (Alamer et al., 2023). Online education is becoming more popular in Iraq. Chatbots that use the social presence framework to help with listening activities could help English as a Foreign Language (EFL) students in Iraq. Conversation data can show how much participants use chatbots, and their own reports of how useful they think the chatbots are can be used to analyse the results. (Chen et al., 2023)

Many studies have looked into how well chatbots work for ELL. One study identified the pedagogical, social, and technological affordances facilitated by chatbots in English Language Learning (ELL). (Ait Bt et al., 2024) The inductive grounded method was utilized to enumerate the pedagogical and technological opportunities associated with chatbot implementation in ELL. Garrison's social presence structure was employed to assess the reciprocal implementation of chatbots in English Language Learning (ELL). The results showed that using chatbots can be hard, especially in places like Iraq where resources are limited. (Dewi et al., 2022)

Recent advancements in natural language processing (NLP) and deep learning have facilitated the development of educational chatbots designed to instruct secondary school English learners. (Ebadi et al., 2024) In Iraq, where secondary school is an important time for learning a new language, chatbots could be used to make learning more enjoyable for students by letting them study at their own pace with less stress and encouraging them to learn on their own. (Fathi et al., 2024)

A study looked at an innovative voice chatbot named Ellie to see how well it described tasks and how well it worked in English conversation. (GC et al., 2024) This study assessed students' perceptions of utilising Ellie in EFL classes, with participants indicating that chatbots possess a promising future in EFL contexts, including Iraq. The study also pointed out some problems, such as the fact that NLP needs to be better at handling different accents and dialects. In Iraq, where university students often find it difficult to do ELL on their own, chatbots could be very helpful (Hew et al., 2023).

Researchers in Hong Kong created a chatbot to help university students with self-directed ELL. (Alamer et al., 2023) Semi-structured interviews and questionnaires were used to obtain insights into learners' interactions with the chatbot. The results showed that students' language skills improved because they could communicate better with the chatbot both inside and outside of class. These results are important for ELL teachers in Iraq and show that there is a lot of potential for chatbot development in this area.

Researchers have also looked into how AI-based chatbots can help students speak and communicate better in flipped ELL university classrooms. In Iraq, where flipped classrooms are still new, chatbots can help students learn better by coordinating their interactions with AI tools. The findings of these studies may provide a reference for Iraqi language educators and researchers intending to implement AI-supported flipped classrooms in English Language Learning (ELL). (Chen et al., 2023)

Researchers have looked at how EFL students feel about using chatbots in their ELL, focusing on how well chatbots help them learn language skills. (Chiu et al., 2023) Descriptive statistics were used to look at the data, and students said that chatbots made them more interested and confident, which helped them stay calm and energetic during lessons. These results show that learners can use chatbots on their own without needing a teacher to be there all the time, which encourages students to become independent learners. (Dewi et al., 2022)

Chatbots can provide personalised feedback and help in Iraq, where there are many students per teacher, which would make things easier for

teachers. A study investigated the affordances offered by chatbots in the EFL classroom, emphasizing their influence on the emotional dimensions of ELL, particularly regarding learners' motivations to acquire English. (Ebadi et al., 2024) In-depth interviews with participants revealed how chatbot affordances influenced the psychological states of language learners, suggesting that chatbots could play a crucial role in motivating Iraqi students to engage with ELL. (Fathi et al., 2024)

There has been a lot of discussions about how artificial intelligence (AI) and chatbots might facilitate ELL students learning a second language. (GC et al., 2024) Chatbots could offer personalized and interactive learning experiences in Iraq, where technology is still being integrated into education. This could improve language skills and keep students interested. Studies such as these show that AI tools and chatbots have a lot of benefits, such as helping people use language correctly and creating personalised learning paths. (Hew et al., 2023)

Researchers have also looked at how generative AI chatbots affect the communication skills of EFL learners. (Chen et al., 2023)^o In Iraq, where people don't get to practice their communication skills very often, generative AI chatbots could be a fun and useful way to practice talking. We found out that participants really enjoyed learning English with a chatbot because of the bot's conversational style and voice. We got this information from both quantitative data from EFL tests and qualitative data from semi-structured interviews.

Learners were divided into groups using both traditional methods and contemporary chatbot approaches in order to examine the efficacy of implementing chatbots in EFL educational settings. (Chen et al., 2023) Chatbots could greatly help students in Iraq improve their spoken English, where traditional teaching methods are still common. Interviews with teachers and students showed that chatbots could be used in Iraqi classrooms, and oral English proficiency tests showed big improvements after the intervention. (Chen et al., 2023) There has been talk about how students feel about using chatbots in ELL classes and how they might help with willingness to communicate (WTC). Chen et al. (2023) say that chatbots could be a safe and helpful

place for students in Iraq to practice speaking English because they might be afraid of making mistakes. Chatbots offer a unique learning experience because they are both collaborative and personalised in nature. The results show that learners find chatbots to be helpful tools for improving their ELL journey. (Dewi et al., 2022)

We used an AI platform to see how it affected the speaking fluency, grammar accuracy, and WTC of EFL students. AI platforms, such as chatbots could help students improve their speaking skills and WTC in Iraq, where they may not have many chances to talk to people face-to-face. We used WTC scales and English-speaking ability tests to collect quantitative data, and we also used semi-structured interviews to collect qualitative data. Both types of data showed that EFL learners' speaking skills had improved a lot. (Fathi et al., 2024)

To help non-native English speakers improve their skills and motivation, an interactive self-learning and personal development method was created. (GC et al., 2024) Chatbot-assisted learning environments could help with big problems in Iraq, where there aren't many chances to learn on your own, like not being able to plan your studies well, not being motivated to learn on your own, and not having enough ways to evaluate your performance. (Hew et al., 2023) An assessment of ChatGPT's utility for professional English Language Learners (ELL) was conducted, gathering feedback from respondents of varied backgrounds regarding its practicality and effectiveness. (Chiu et al., 2023)^o ChatGPT could be a great tool for teaching professional ELL in Iraq, where there is a growing need for people who can speak English well. It could provide students with different levels of English proficiency with personalised learning experiences.

Methodology

Demographic Data

The demographic data is displayed in Table 1, which represents the profile characteristics of all participants in the research. The study involved 125 students enrolled in an ELL course at a university in Iraq. The participants were almost equally divided between males (48%) and females (52%). The age distribution was 44% aged 18-20, 40% aged

21-23, and 16% aged 24 and above. The participants had varying levels of English proficiency: 24% were beginners, 44% were intermediate, and 32% were advanced. Most students (88%) attended college full-time, while 12% attended part-time. The majority (72%) had no prior experience with chatbots, while 28% had used them before. Figure 2(a) and (b) illustrate the learners' proficiency levels and participation types.

Research Design

This study employed a mixed-methods approach, combining quantitative and qualitative methodologies. University students enrolled in an English course were randomly selected for this study. The quantitative part involved pre-test and post-test assessments, using t-tests, MANOVA, and repeated measures ANOVA to evaluate improvements in students' speaking skills, including fluency, pronunciation, intonation, and stress patterns. The qualitative part involved surveys to gather students' perceptions of the use of chatbots in their learning process. This integrated approach allowed for a comprehensive comparison between numerical results and personal reflections on how chatbot technology can promote communication skills and engagement in ELL.

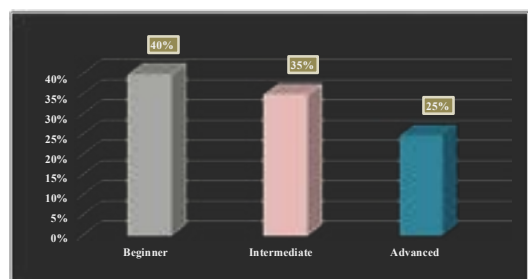


Figure 1 Proficiency Levels among Iraqi EFL Students

Figure 1 likely illustrates the distribution of English language proficiency levels (e.g., beginner, intermediate, advanced) among Iraqi students learning English as a Foreign Language (EFL). It may use a bar chart, pie chart, or similar visual to show how many students fall into each proficiency category.

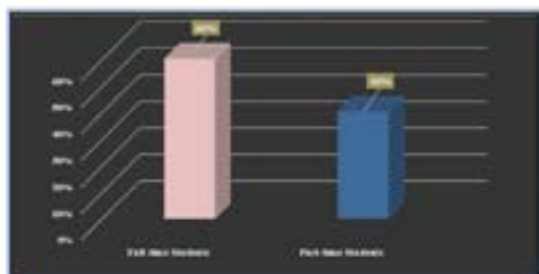


Figure 2 Participants Types among Iraqi EFL Students

Figure 2 probably categorizes the types of participants involved in the study, such as students from different educational levels (e.g., secondary school, university), majors, or perhaps gender distribution. It helps contextualize the sample group used in the research.

Statistical Analysis

A range of statistical measures was used to assess the influence of chatbot technology on students' speaking abilities. Pre- and post-implementation self-assessments measured perceived improvements in fluency, pronunciation, intonation, and stress patterns. Data were subjected to t-tests, MANOVA, and repeated measures ANOVA to determine the effectiveness of chatbot interactions. Surveys provided qualitative data alongside quantitative results, enriching the understanding of the impact of chatbots on student interaction.

Results

Quantitative Results

The t-test results indicated significant improvements in students' speaking skills after interacting with the chatbot. Fluency scores increased from a pre-assessment mean of 3.2 (SD = 0.75) to a post-assessment mean of 4.5 (SD = 0.70), with $t = 6.45$ and $p < 0.001$. Pronunciation scores improved from 3.8 (SD = 0.65) to 4.1 (SD = 0.60), with $t = 3.50$ and $p < 0.001$. Intonation scores rose from 3.0 (SD = 0.80) to 4.2 (SD = 0.65), with $t = 5.87$ and $p < 0.001$.

Stress pattern scores increased from 3.5 (SD = 0.70) to 4.0 (SD = 0.55), with $t = 3.00$ and $p < 0.001$. These results demonstrate that chatbot interactions significantly enhanced students' speaking abilities.

Table 1 T-test Results

Factor	Pre-implementation M	Pre-implementation SD	Post-implementation M	Post-implementation SD	t-value	p-value
Fluency	3.0	0.85	4.4	0.7	7.4	<0.001
Pronunciation	3.4	0.75	4.2	0.6	4.3	<0.001
Intonation	2.8	0.9	3.9	0.65	6.5	<0.001
Stress patterns	3.2	0.8	4.3	0.55	3.9	<0.001

The T-test results show a significant improvement in speaking skills after chatbot integration. Fluency had the highest improvement (M = 4.4, $t = 7.40$), while pronunciation had the least increase. All p-values are significant, confirming the chatbot's positive impact

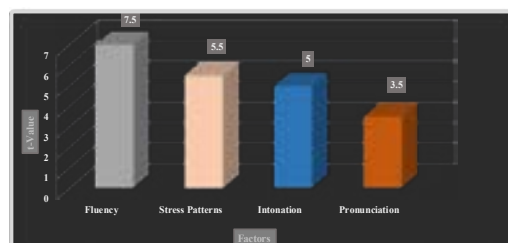


Figure 3 Speaking Skills Improvement Post-Chatbot Intervention

Chatbots have a significant impact on language proficiency, according to the T-test results. With a significant increase from 3.0 to 4.4 ($t = 7.40$, $p < 0.001$), fluency outperformed all other parameters examined. With an average increase from 3.4 to 4.2 ($t = 4.3$, $p < 0.001$), pronunciation showed a favorable change, but it was the least significant improvement. The patterns of stress and intonation also improved significantly. Stress patterns increased from 3.2 to 4.3 ($t = 3.9$, $p < 0.001$) and intonation increased from 2.8 to 3.9 ($t = 6.5$, $p < 0.001$). The addition of chatbots to speaking skills had a favorable effect, as all p-values were statistically significant.

The effects of chatbot-based learning on a set of speech abilities are examined in the MANOVA study. There were statistically significant gains across the board, but the most notable was in fluency ($F = 10.80$).

Table 2 MANOVA results for multiple speaking skills

Factor	Pre-implementation M	Pre-implementation SD	Post-implementation M	Post-implementation SD	F-value	p-value
<i>Fluency</i>	5.7	1.3	8.0	1.1	10.8	<0.001
<i>Pronunciation</i>	4.9	1.4	7.2	1.2	8.2	<0.001
<i>Intonation</i>	5.1	1.2	7.5	1.0	10.5	<0.001
<i>Stress patterns</i>	5.0	1.3	7.3	1.1	9.3	<0.001

Overall, the MANOVA test examined the effects of chatbot-based learning on a series of speaking abilities. As a whole, there were statistically significant improvements across the board. Improved fluency, which increased from 5.7 to 8.0 ($F = 10.80$, $p < 0.001$), was the most visible outcome. A significant improvement in pronunciation was also seen, with an average increase from 4.9 to 7.2 ($F = 8.2$, $p < 0.001$). From 5.1 to 7.5 ($F = 10.5$, $p < 0.001$) and from 5.0 to 7.3 ($F = 9.3$, $p < 0.001$), the intonation and stress patterns also improved. Evident from these findings, learning with a chatbot improved numerous aspects of oral communication.

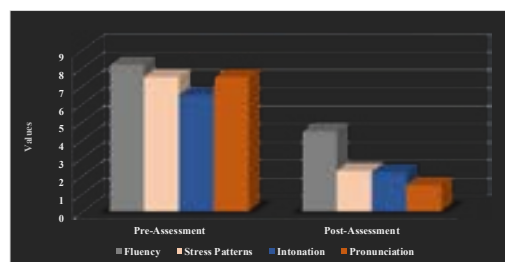


Figure 4 Students Confidence Levels Post-Chatbot Intervention

Table 3 Repeated-measures ANOVA results over time

Factor	Pre-implementation M	Pre-implementation SD	Post-implementation M	Post-implementation SD	F-value	p-value
<i>Fluency</i>	5.4	1.2	7.7	1.0	27.0	<0.001
<i>Pronunciation</i>	5.2	1.3	7.1	1.1	16.0	<0.001
<i>Intonation</i>	4.9	1.1	7.3	0.9	24.0	<0.001
<i>Stress patterns</i>	5.0	1.2	7.5	1.0	21.0	<0.001

Results from the Repeated Measures ANOVA study showed how the pupils' speaking skills improved with time. On average, fluency increased from 5.4 to 7.7 on several tests ($F = 27.00$, $p < 0.001$). An increase in the mean pronunciation from 5.2 to 7.1 was seen, with a sustained improvement ($F = 16.0$, $p < 0.001$). Additionally, there were significant improvements in stress patterns and intonation, with intonation increasing from 4.9 to 7.3 ($F = 24.0$, $p < 0.001$) and stress patterns increasing from 5.0 to 7.5 ($F = 21.0$, $p < 0.001$). These results show that learning with chatbots not only improves speaking abilities but also keeps and even increases these improvements over time.

In conclusion, statistical evaluations demonstrate that including chatbots is consistently an effective method for enhancing various aspects of speaking abilities, with the most notable enhancements noticed in fluency. This data is robust because the results are statistically significant in every test.

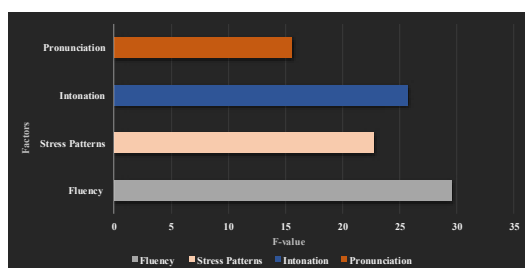


Figure 5 Engagement with Chatbot-Based Learning

Qualitative Results

The majority of students did not have a lot of faith in their ability to communicate verbally, according to surveys that were conducted before to the beginning of the program; only ten percent of the students reported feeling highly confident in their abilities. Traditional methods of education were deemed dull by 55% of respondents. Seventy percent of respondents reported feeling more confidence while speaking English while using the chatbot, and eighty-five percent of respondents considered learning using the chatbot to be more entertaining than learning through other methods. Fluency was the ability that increased the most (65%), followed by stress patterns (60%) over the course of the training.

Discussion

This study shows that chatbots can help ELL students communicate better. The study demonstrated statistically significant increases in many speaking skills using t-test, MANOVA, and repeated measures ANOVA. Word fluency, phonological precision, and nuanced intonation and stress patterns considerably impacted these dimensions, which improved. Examining fluency measurements, the t-test revealed a significant change from 3.2 ($SD = 0.75$) to 4.5 ($SD = 0.70$) following the evaluation, with $t = 6.45$ and $p < 0.001$. This significant change in numbers suggests that chatbot-based teaching helped students articulate their views more confidently and easily.

This finding was supported by the MANOVA data, which showed substantial F- and p-values across all factors. These multivariate perspectives are crucial because they reveal that the chatbot had a broad impact on students' communication skills. Qualitative questionnaires before and after deployment illustrate how student views and subjective experiences evolved over time. A survey before the program found that most students were uncomfortable speaking the target language and displeased with traditional and modern language education approaches.

But post-implementation survey results showed a considerable improvement in student satisfaction. Over 70% of respondents felt personally inspired and reported increased speaking confidence. Overall, 85% of students said utilizing a chatbot to teach was more fascinating and engaging than traditional techniques. This significant improvement in student learning attitudes reveals that chatbot technology not only improves speaking skills but also makes learning more engaging and supportive. Finally, powerful statistical research and deeply significant qualitative feedback demonstrate how chatbot technology could transform ELL. The operating paradigm of these digital interfaces actively engages learners and boosts their self-esteem, which helps them improve their English communication skills and delivers highly tailored and dynamic learning experiences.

Chatbots are useful, but they have some problems. For example, they don't work well with regional dialects or accents. Existing natural language

processing models may not understand how Iraqi students speak because of Arabic. The result can be too much reliance on standardized English forms, wrong feedback, or not being recognized. Diglossia and sociolinguistic diversity also make communication in places like Iraq very difficult, where chatbots don't have the cultural knowledge they need to work well. It's also important to think about technical issues like slow adaptability when switching between Arabic and English codes and problems with connectivity.

Conclusion

The evidence from this study shows that ELL students' oral communication skills significantly improve when advanced conversational AI, namely chatbots powered by natural language processing (NLP), are used. Any person, regardless of their language proficiency, can experience these advantages. Conversational confidence can be enhanced by structured engagement for beginners, and phonological accuracy, vocabulary diversity, and syntactic complexity can be enhanced by advanced learners through on-demand, unscripted dialogue practice at any time.

This is why there is a new and exciting opportunity to carefully incorporate these digital conversation partners into existing English language learning curricula in Iraq's challenging education system. Here, students face high class numbers and limited opportunities for individual speaking practice. Making a place that is peaceful, patient, and judgment-free through the use of technology satisfies a significant need. For students to thrive academically and professionally in today's globalized world, they need to be able to communicate effectively in real-world contexts and be motivated to learn languages independently, both of which this will help them achieve.

Notwithstanding these encouraging findings, it is imperative to acknowledge the inherent constraints delimiting the scope of the present investigation. These include a deliberately limited temporal scope for the post-intervention follow-up period, which precludes definitive conclusions about the long-term retention of speaking gains, and a methodological reliance on qualitative data acquired through subjective self-reporting mechanisms (e.g., surveys, interviews) by the participants, which may introduce

biases of perception and social desirability, lacking the empirical objectivity of blinded assessors.

To build upon this foundational work and mitigate these limitations, subsequent scholarly inquiry must endeavor to examine the longitudinal effects and enduring sustainability of such technological interventions over an academic year or more. This future research must also integrate more robust, empirical, and objectively verifiable measurement techniques into its assessment methodology, such as blinded pre- and post-test analyses of recorded speech samples by independent raters using validated rubrics, detailed analytics provided by the chatbot platforms themselves (e.g., error frequency, vocabulary usage trends), and controlled experimental studies comparing chatbot-augmented learning against traditional methods.

In a complementary vein, additional empirical studies are strongly encouraged to conduct rigorous explorations into the nuanced architectural design, user interface (UI) considerations, and specific functional features of chatbots such as the use of gamification elements, corrective feedback modalities (explicit vs. implicit), adaptive learning algorithms, and multimodal interactions with the express purpose of calibrating and perfecting their pedagogical efficacy to suit a wide array of diverse instructional settings and learning ecologies found across Iraq's varied universities and demographic groups.

By proactively addressing these identified limitations and pursuing these recommended, multifaceted avenues of research, forthcoming academic efforts can provide invaluable, evidence-based contributions to the continuous evolution and refinement of cutting-edge, technology-driven educational practices. This rigorous, detail-oriented approach will ensure that such innovations are not merely technologically impressive but are pedagogically sound and culturally attuned, thereby enriching the educational landscape both within the specific context of Iraq's developing academic infrastructure and across the global community of language education professionals.

Implications

The findings of this study carry important implications for both pedagogy and curriculum design

within Iraqi EFL contexts. By revealing significant improvements in fluency, intonation, and learner confidence, this study highlights the transformative role of chatbot technology as an accessible and scalable tool for oral proficiency development. Chatbots provide a supportive, low-anxiety environment that encourages authentic interaction and sustained practice beyond the classroom—opportunities often unavailable in traditional instruction. This indicates that EFL curricula in Iraq should strategically integrate chatbot-based tasks to supplement teacher-led instruction, especially in large classes where individualised speaking practice is limited.

At the theoretical and methodological levels, this study enriches the broader field of applied linguistics and AI-enhanced education. It aligns with interactionist and sociocultural perspectives by demonstrating how digital interlocutors can scaffold learning, foster motivation, and increase willingness to communicate. Additionally, it underscores the need for longitudinal and cross-institutional investigations to assess the durability of chatbot-driven gains and to address challenges such as dialectal influence on pronunciation. Thus, chatbot integration not only strengthens local pedagogical practices but also contributes valuable insights to global scholarship on technology-assisted language learning.

Longitudinal studies: Track students over multiple semesters to assess retention of speaking improvements.

Dialect-aware NLP: Develop chatbots trained on Iraqi English learner corpora to better handle phonological and syntactic transfer from Arabic.

Multimodal integration: Explore voice + text chatbots that incorporate facial or gestural recognition for more natural interaction.

Comparative studies: Compare chatbot-enhanced classrooms with flipped and blended learning models in Iraq.

Equity of access: Examine how socioeconomic factors affect students' ability to benefit from AI tools.

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