AI -Powered Language Learning: Enhancing Speaking Skills Among Saudi Female EFL Learners

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Abstract

This study employed artificial intelligence (AI) to develop the speaking skills of Saudi female EFL learners. A mixed -methods, quasi -experimental design was used, with 67 participants assigned to an experimental group and a control group. The experimental group received speaking instruction with the addition of two AI -based tools: ELSA Speak and ChatGPT. Quantitative data were gathered using pre and post speaking tests, along with qualitative data through a focus group. Quantitative results indicated that the experimental group showed a significant improvement in their speaking skills (pronunciation accuracy: 45.1% increase, fluency: 42.9% increase, speech errors: 63.8% decrease). The use of AI tools was found to have a strong positive relationship with speaking performance ($r = 0.78$, $p < 0.01$). Qualitative data from the focus groups suggested the AI approach provided positive distinctive advantages: students reported increased autonomy in their speaking practice, reduced anxiety when speaking in English, and feedback tailored to their practice compared to the traditional learning context. AI can assist in reducing linguistic barriers to improve students' speaking performance by providing an engaging and adaptive practice environment that increases learners' confidence and motivation. Meanwhile, there were also challenges reported such as cultural relevance of AI content and technical limitations (e.g., internet access and software). It is suggested that AI be integrated into EFL curriculum, and digital literacy training for students be implemented and culturally relevant AI applications developed. The study advances language education literature by identifying effective strategies to enhance EFL learners' speaking skills using AI while also providing educators and policymakers recommendations on how to influence and introduce AI to language learners.

Keywords: AI -powered language learning, speaking proficiency, learner autonomy, pronunciation accuracy.

تعلم اللغة المدعوم بالذكاء الاصطناعي: تعزيز مهارات التحدث لدى الطالبات السعوديات متعلمي الإنجليزية بوصفها لغةً أجنبية

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المستخلص:

استخدمت هذه الدراسة تعلم اللغة بمساعدة الذكاء الاصطناعي لتطوير مهارات التحدث لدى الطالبات السعوديات متعلمات اللغة الإنجليزية كلغة أجنبية، من خلال تصميم شبه تجريبي متعدد الأساليب شمل 67 مشاركة موزعات على مجموعتين: تجريبية وضابطة. تلقت المجموعة التجريبية تعليمًا في مهارات التحدث مدعومًا بأداتين قائمتين على الذكاء الاصطناعي: ELSA Speak وChatGPT. جُمعت البيانات الكمية باستخدام اختبارات التحدث القبلية والبعدية، بينما جُمعت البيانات النوعية من خلال مقابلات جماعية مركزة. أظهرت النتائج الكمية تحسنًا كبيرًا في مهارات التحدث لدى المجموعة التجريبية (زيادة في دقة النطق بنسبة 45,1٪، وزيادة في الطلاقة بنسبة 42,9٪، وانخفاض في الأخطاء الكلامية بنسبة 63,8٪). كما تبين وجود علاقة إيجابية قوية بين استخدام أدوات الذكاء الاصطناعي وتحسن الأداء الشفهي($r = 0.78, p < 0.01$). وأظهرت البيانات النوعية مزايا واضحة لهذا النهج؛ حيث أبلغت الطالبات عن زيادة في الاستقلالية، والانخفاض في القلق أثناء التحدث، وتلقي تغذية راجعة مخصصة تفوق ما تقدمه البيئة التعليمية التقليدية. ورغم هذه الفوائد، تم الإبلاغ عن بعض التحديات، منها مدى ملاءمة المحتوى ثقافيًا والقيود التقنية كضعف الإنترنت. توصي الدراسة بدمج الذكاء الاصطناعي في مناهج تعليم اللغة الإنجليزية، وتوفير تدريب رقمي للطلاب، وتطوير تطبيقات ذكاء اصطناعي تراعي الخصوصية الثقافية. وتُسهم هذه الدراسة في أدبيات تعليم اللغة من خلال اقتراح استراتيجيات فعالة لتحسين مهارات التحدث باستخدام الذكاء الاصطناعي، وتقديم توصيات للمعلمين وصناع القرار بشأن كيفية توظيفه وتقديمه للمتعلمين.

الكلمات المفتاحية: تعلم اللغة باستخدام الذكاء الاصطناعي، كفاءة التحدث، استقلالية المتعلم، دقة النطق.

Introduction

The rapid advancement of AI has generated transformative potential in language education, especially speaking abilities development. AI -powered systems, including Intelligent Tutoring Systems (ITS) and conversational agents, employ natural language processing and machine learning to offer immediate and adaptive feedback and individualized instruction (Yang, Wen, & Song, 2023). These technologies can respond to learners' input in real -time and provide appropriate levels of difficulty and content delivery depending on the individual's performance. For instance, automated speaking evaluators, ITS platforms, and AI chatbots are increasingly used in the realm of speaking instruction, facilitating active engagement and self -directed practice (Jiang, 2022). The ability of these systems to deliver continuous, individualized input and output practice underscores their potential to foster sustained learner engagement, improve linguistic accuracy, and accelerate oral fluency development.

Although English has been taught within Saudi EFL contexts for many years, many learners still experience major challenges with effective speaking skills by the time they reach higher education (Al -Seghayer, K. (2014)). The conventional form of instruction is formalized in such a way as to expose language learners to the language, but it does not provide sufficient opportunities for learners to speak in a real and low -anxiety environment (i.e., as is necessary for communicative competence). The pre -existing literature has documented numerous barriers to obtaining oral proficiency, including the lack of practice in authentic contexts, fear of speaking without making mistakes, and a teacher -centered classroom. In light of this, language learning technologies powered by AI represent a viable alternative to traditional instruction. These AI platforms can immerse learners in a form of real -life conversation in a non -threatening space that allows engagement with the language, access to immediate corrective feedback, and ample time to practice engaging in spoken interaction that supports fluency and accuracy (Yang et al., 2023; Jiang, 2022).

New evidence exists of the pedagogical benefits of engaging learners with AI technologies through the lens of speaking instruction. Alharthi (2024) reported that Saudi university students, who engaged in regular practice using ChatGPT, showed improvements in pronunciation, fluency, and overall confidence as communicators in English. In a similar way, Ma, Noordin, and Razali (2025) found that EFL undergraduates, who used an AI mobile application to practice speaking, were substantially better than the control group who participated in face -to -face instruction dealing with similar materials. Mahdi (2024) also noted that AI -enhanced speaking has led to learners' greater motivation and engagement. Jamshed et al. (2024) cited an increase in students' motivation to participate in speaking, create personal learning objectives, and persist despite linguistic challenges. Taken together, this evidence indicates that AI can offer some solutions to the limitations of traditional pedagogy by providing investment, flexibility, and opportunities for affective support in speaking development.

However, AI should be implemented thoughtfully in language instruction. Deploying AI in order to be effective must include a strong infrastructure, school support, and digital literacy from both the educators and the learners. Insufficient training or misaligned pedagogy may mitigate the effectiveness of the AI tool or result in disjointed use (Katiyar et al., 2024; Luckin et al., 2016). Additionally, learner trust should be maintained by resolving ethical issues surrounding data privacy, consent, and algorithmic bias (Katiyar et al., 2024). Researchers also caution that an overreliance on AI may develop learner dependence that will interfere with the ability to

learn distinct independent communicative strategies or critical thinking skills (Spatola, 2024), while also underscoring the human element that cannot be substituted by AI (Alsaif, 2024). The study examines how to capitalize on AI -powered technologies to benefit Saudi EFL learners to speak through the following research questions.

1. How can AI -powered technologies support the development of speaking skills for Saudi female EFL students?

2. What opportunities and challenges do Saudi female EFL students experience when using AI -based applications to improve their speaking competence?

    In examining these questions, the study hopes to produce a better understanding that leads to better informed optimization of the AI -assisted language learning tools to improve the speaking skills of Saudi female EFL students.

Literature Review

Theoretical Foundations of AI in Language Education

The integration of AI into language instruction is stemmed through a combination of theoretical frameworks which emphasize individualized, adaptive, and communicative learning. The foundation of AI -mediated language education is, at its core, drawn from Vygotsky's (1978) sociocultural theory of learning, which suggests language acquisition is best facilitated within a social, interaction -rich environment. Using AI applications, especially conversational agents and ITS, provides for such an environment, as it allows the learner to engage in interactional feedback loops that scaffold their progress regarding the eventual language autonomy. Constructivist approaches to language learning similarly support the use of AI -assisted language learning tools because they allow learners to actively construct meaning while completing real -time, interactive tasks (Jonassen, 1999). These theoretical bases support AI as a pedagogically sound supplement to conventional instruction, particularly in skills that require practice, personalization, and feedback.

The provision of automated feedback can fall within foundational theories of formative assessment and cognitive load theory, in which timely corrective feedback can promote retention of performance without overloading learners (Sweller, 2011). AI technologies, such as the ELSA Speak app and ChatGPT, can provide immediate feedback on pronunciation, fluency, and grammaticality in real -time promote students' oral development. In this instance, AI serves not only as a delivery mechanism, but also as a metacognitive tool which allows learners to reflect on their performance when engaged in speaking activities. (Mayer, 2019). Taken together, these theoretical bases create a solid argument for the use of AI in speaking instruction in EFL contexts.

AI and Developing Speaking Skills

A growing body of research supports AI's ability to support EFL learners in the development of speaking skills. ITS and chatbot -based applications have been utilized in various educational contexts and have shown growth in areas such as fluency, pronunciation, or learner confidence. For example, Ma, Noordin, and Razali (2025) showed that Chinese university students who practiced speaking with AI applications significantly outperformed the control group who were speaking using conventional methods in the areas of pronunciation accuracy and fluency. Jamshed et al. (2024) found that AI -enhanced instruction resulted in increased motivation

among learners' and increased engagement in oral tasks due to the interactive and personalized nature of an AI -mediated speaking environment.

AI's unique capabilities lie in its ability to reproduce authentic conversations without the social anxiety of talking to peers or the teacher. It was found by Xu and Wang (2023) that, when conversing with an AI chatbot, students demonstrated increased willingness to communicate and decreased speaking anxiety. Furthermore, AI's speech recognition and natural language processing capabilities enabled valuable tools that assess and correct spoken errors instantaneously, creating a situation where sustained oral practice is possible. Furthermore, AI enables asynchronous speaking practice for students; therefore, it allows students to practice speaking when it is convenient for them, which promotes engagement with spoken English regularly and encourages the development of oral fluency (Zhou & Zhang, 2022).

AI -Driven Feedback and Pronunciation Improvement

AI's ability to provide individualized, high -frequency feedback is among its most pronounced affordances for speaking instruction and practice. ELSA Speak is an example of an algorithm that detects and models pronunciation deviation, while conversational agents, such as ChatGPT, can create interactive contexts for extended spoken production. According to Yang, Wen, and Song (2023), this adaptive feedback has been shown to speed up oral development by reinforcing accurate speech production and addressing persistent errors. Pronunciation training has benefitted from AI's ability to distinguish subtle phonological deviations that may not be possible in the regular classroom.

Furthermore, the multiple modalities that AI can provide facilitate auditory, textual, and visual feedback, which caters to different learning styles and advances phonological awareness (Sun & Teng, 2021). Rahimi and Behjat (2023) found that EFL students who received AI -assisted pronunciation instruction outperformed their peers. AI technologies are not only used in conjunction with traditional instruction but also assist learners with one -on -one practice and provide immediate and detailed feedback for learners self -correct and improve through in their learning.

AI and Learner Autonomy in Speaking Practice

AI tools foster learner autonomy by creating an individualized pacing, a self -selection of practice content, and self -monitoring of practice content. Chen and Lee (2022) claim students are empowered to take control of their oral language development when utilizing AI -supported learning platforms, which maintain students' engagement and self -efficacy. AI tools also support reflection during speaking practice through goal setting and automated assessments and by logging feedback. For Saudi EFL learners, who may have limited opportunities to practice, the self -directed aspect of AI tools can be very advantageous. Students can practice speaking in their own space, limit public embarrassment, direct their own learning cycles of practice that may not occur in a group setting, and benefit from AI -supported feedback. Having access through mobile applications at a time chosen by students also supports autonomy as students can maintain their own time for spoken English development (Jiang, 2022).

AI in the Saudi EFL Context: Opportunities and Challenges

Although research on AI in language education is expanding, the Saudi context presents unique challenges and opportunities that necessitate localized inquiry. Despite long -term formal exposure to English, many Saudi students still struggle to attain communicative competence

in speaking at the university level (Alharthi, 2024). Studies indicate that this persistent gap is partially attributable to teacher -centered pedagogies, limited speaking practice in the classroom, and a lack of authentic interactional exposure (Alsaif, 2024). AI tools offer a potential remedy by creating immersive, learner -centered speaking environments that reduce performance anxiety and provide real -time scaffolding.

Alzahrani and Mahzari (2023) found that Saudi teachers recognize the potential for AI to be a useful pedagogical tool in the classroom; however, most teachers lacked the proper preparation or support from their institutions to start or further develop their use of AI tools in the classroom. In a recent study, Alharthi (2024) found that students using ChatGPT to practice speaking made large improvements in fluency, pronunciation, and confidence communicating in English over a 10 -week intervention. The study also indicated that students were more engaged in using the tool, especially learners who had not previously participated or felt shy about speaking in class. The study shows how the trends observed globally may hold some relevance in Saudi Arabia, and the results suggest that AI, when carefully introduced and applied, can overcome one of the long -standing barriers to EFL speaking instruction in Saudi Arabia. However, limitations regarding the implementation of AI were still noted.

Along with limitations related to the infrastructure and available technology, cultural attitudes toward technology and privacy issues in the use of data continue to influence the adoption of AI tools into classrooms in Saudi Arabia. According to Katiyar et al. (2024), the collection and use of learner data to inform AI applications and processes without ethical frameworks may compromise student trust and privacy. Likewise, the effective use of AI requires technology readiness, and it is also necessary to introduce policies and curriculum related to teachers' training in using AI in EFL classes.

Methodology

Research Design

The current study employed a mixed -methods research design. Specifically, an explanatory sequential design (Creswell & Clark, 2017) was applied to consider the effect of AI on speaking skill development. For the first phase (quantitative), a quasi -experimental pretest–posttest design, with a nonequivalent control group, was applied to examine the degree of student improvement in speaking performance as a result of the AI -based learning. The qualitative strand included focus group interviews, aiming to gain further insight into students' experience. The use of these triangulated data collection methods enriched the study results (Denzin & Lincoln, 2011). Specifically, integrating qualitative and quantitative techniques occurred during analysis and interpretation provides a more comprehensive understanding of the results.

Participants

A total of 67 Saudi female EFL learners (aged 18–21 years) participated in the study. They were first -year undergraduate students (Level 1) in a university English program. A convenience sampling strategy was used to recruit participants, and two intact class sections were assigned as the experimental group (n = 35) and the control group (n = 32). All participants had comparable proficiency levels in English; an institutional placement exam aligned with the Common European Framework of Reference for Languages (CEFR) indicated that their speaking ability was approximately at the A2 (elementary) level at the start of the study (Council of Europe, 2001). Ethical procedures were followed by obtaining informed consent, assuring anonymity,

and reminding students of their right to withdraw from the research at any time.

For the qualitative component, a subset of the experimental group was selected for focus group participation. Using purposive sampling, 12 students from the experimental class were invited to join focus group interviews, ensuring a mix of high, moderate, and low proficiency students. This selection strategy was intended to capture diverse perspectives on the AI intervention. All focus group participants provided separate consent for the interviews.

Instruments

The study employed three instruments and data sources to gather both quantitative and qualitative evidence:

Speaking Pretests and Posttests. Speaking proficiency was assessed before and after the 15 -week intervention using an oral test scored with a CEFR -aligned analytic rubric. The rubric evaluated key speaking components – fluency, pronunciation, grammatical accuracy, and lexical resource – on defined scales corresponding to CEFR performance descriptors. To ensure objective assessment, the students' speaking performance (e.g., responses to interview questions or picture description prompts) were audio -recorded and later evaluated by two trained external raters. The raters were experienced EFL instructors who were first calibrated on sample recordings to standardize their scoring according to the rubric. They rated each student's speech independently; any scoring discrepancies were discussed and resolved, yielding a high level of inter -rater agreement. Both pre - and post -test speaking evaluations were conducted under equivalent conditions, and results were recorded for statistical analysis.

AI Tool Analytics. Data generated by the AI applications provided supplementary quantitative measures of speaking practice and improvement. ChatGPT conversation transcripts were reviewed for indicators of complexity, accuracy, and error frequency in students' spoken output, while the ELSA Speak app automatically provided metrics such as pronunciation scores, fluency ratings, and feedback on mispronunciations. These usage analytics were collected throughout the intervention to track each learner's progress. The AI tools' data were not used for formal grading but served to inform and triangulate the pre/post -test results.

Focus Group Interviews. These interviews were conducted to qualitatively investigate students' experiences with the AI interventions. Two focus group interviews were conducted post -intervention with 6 students each from the experimental group in a private classroom space. A discussion guide that included open -ended prompts guided the interviews which took place as a forum to discuss the benefits, challenges, and general impressions of using ChatGPT and ELSA Speak for speaking practice. Each interview session lasted around an hour (60 mins), and to the student's consent, the interviews were audio recorded. Subsequently, each audio recording was transcribed verbatim to allow for complete analysis of the participants' approaches to the interventions.

Procedure

The intervention took place over 15 weeks during the first semester of the 2024 -2025 academic year. The experimental group and the control group completed the same curriculum and same schedule based on the existing textbook *Pathways: Listening, Speaking, and Critical Thinking 1*. Instructional procedures for each group were:

Experimental Group. The students in the experimental group received the same baseline

instruction as the control group in addition to regular practice with AI tools. During the 3 class sessions each week, about 30 minutes of instructional time was set aside for students to use ChatGPT and ELSA Speak under the researcher's (the course instructor) guidance. During the sessions, the students practiced spoken interaction by speaking with ChatGPT (through responding to text -based prompts) and participated in practice tasks to enhance their pronunciation and fluency through ELSA Speak. The instructor provided an initial training workshop that demonstrated how to use the apps and ensured that all students were able to effectively use both apps and how to apply the AI task with lesson learning objectives. To demonstrate this, when the students studied a unit that included describing personal experience, they were to go on to ChatGPT and practice an appropriate conversation or interactive experience with the AI tool and then complete the related pronunciation drills on ELSA Speak. Use of the AI tools by students was closely monitored throughout the instructional intervention to ensure fidelity. The instructor created a logbook with a section for each session that included the AI activity and a notes section to indicate each student's level of engagement and technical issues along the way. Moreover, for ELSA Speak, built -in reporting (total time spoken/pronunciation scores/hours of practice) was periodically collected and verified to ensure the students used ELSA Speak as intended. Students in the experimental group also provided brief reflective self -reports in a weekly journal about their use of ChatGPT and ELSA Speak, describing what they practiced and any challenges or insights. This multi -faceted monitoring approach (instructor logs, app analytics, and student reflections) helped verify that the AI tools were being used consistently and allowed the researcher to detect and address any problems during the study.

Control Group. The students in the control group received traditional face -to -face instruction with no additional AI support. They practiced speaking with standard speaking activities selected from the textbook, as well as standard in -class practice such as teacher -led discussions, speaking in pairs, formal presentations, and other opportunities to practice speaking. There were no materials or practice tasks given to the students outside of the teacher -prepared, instructor -led traditional learning process, or from the textbook; there was no use of ChatGPT or ELSA Speak included for this group.

Data Analysis

Both quantitative and qualitative data were analyzed using appropriate methods, and the two strands were subsequently integrated to draw consolidated conclusions about the intervention's effectiveness.

Quantitative Analysis. The speaking test scores from the pretest and posttest were first examined with descriptive statistics to summarize performance changes in each group. To evaluate the significance of improvement, paired -samples t -tests were conducted on the pretest vs. posttest scores within the experimental group and within the control group. An independent -samples t -test was also carried out on the posttest scores of the two groups to determine the effect of the AI intervention compared to traditional instruction. Significance was set at $p < .05$. Moreover, effect sizes (Cohen's d) were calculated for the gain in speaking scores to assess the practical magnitude of any observed improvements.

Qualitative Analysis. The audio recordings from the focus group were transcribed and analyzed through a thematic analytic approach (Braun & Clarke, 2006). An inductive coding process was adopted, in which two researchers read through each transcript multiple times until they were familiar with the data, then coded segments of the texts independently for

meaningful units pertaining to students' experiences and perceptions. The coding was then compared, developed, and similar codes were aggregated together into larger themes. In total, these themes represented trends of recurrent ideas in the data such as, perceived improvement in fluency, perceived confidence speaking, difficulty using the technology, and suggestions for the future use of AI for speaking practice. To ensure reliability of the qualitative analysis, a third experienced researcher was invited to audit the coding and theme development process. Any differences in interpretation were discussed throughout, until agreement was reached regarding coding and theme development.

Integration and Triangulation. In the final stage, a convergent mixed -methods approach was employed to integrate quantitative and qualitative findings, allowing for a comprehensive interpretation of results (Creswell & Clark, 2017). Statistical improvements in pronunciation and fluency were compared with participant reflections on the use of ELSA Speak and ChatGPT. Converging evidence across data sources was interpreted as reinforcing the intervention's effectiveness, while discrepancies (e.g., low test gains paired with minimal AI engagement) were analyzed for explanatory insights. Triangulation of test scores, AI usage analytics, and interview data enhanced the study's validity and transparency (Denzin & Lincoln, 2011), offering both outcome measures and contextual understanding of how AI -mediated instruction supported Saudi EFL learners' speaking development.

Findings of Quantitative Data

Paired sample t -tests, descriptive statistics, and effect sizes were calculated to determine the statistical significance and practical impact of the intervention.

Table 1

Descriptive statistics for the speaking pretest and posttest scores for the experimental and control groups.

Group	Test	N	Mean	SD	Min	Max
Experimental Group	Pretest	35	62.45	4.73	55	70
	Posttest	35	79.82	5.12	71	88
Control Group	Pretest	32	63.31	5.18	54	72
	Posttest	32	68.47	4.89	60	77

There is only a mean difference of 0.86 points between the experimental group and the control group, which indicates that the experimental group and the control group have similar speaking skills. On the other hand, the posttest scores showed a considerable improvement in the experimental group (M = 79.82) in comparison to the control group (M = 68.47), which suggests that AI -powered treatments have a significant influence on participants' speaking skills.

Paired Sample T -Tests for Pretest and Posttest Scores

To assess whether the observed improvements in speaking scores were statistically significant, paired sample t -tests were conducted for each group.

Table 2

Paired Sample T -Tests for the Experimental and Control groups' Pretest and Posttest Scores

Group	Test	t	df	p -value	Effect Size (Cohen's d)
Experimental Group	Pretest vs. Posttest	-19.37	34	<0.001	3.27
Control Group	Pretest vs. Posttest	-7.23	31	<0.001	1.28

The experimental group demonstrated a considerable improvement in speaking scores, as shown by a large effect size (Cohen's d = 3.27) and a very significant rise in speaking scores (t = -19.37, p < 0.001). This suggests that the group's speaking skill has significantly improved. Furthermore, the control group showed a statistically significant improvement (t = -7.23, p = 0.001); although, the impact size (Cohen's d = 1.28) was significantly smaller, thereby stressing the more major influence of the intervention motivated by AI.

Comparison of Posttest Scores Between Groups

To compare the posttest scores of the experimental group with those of the control group, a t -test with independent samples was carried out.

Table 3

Comparison of Posttest Scores Between the Experimental and Control Groups

Group Comparison	T	Df	p -value	Mean Difference	Effect Size (Cohen's d)
Experimental vs. Control	9.04	65	<0.001	11.35	2.23

A substantial effect size was observed, as shown by the fact that the posttest scores of the experimental group were considerably higher than those of the control group (t = 9.04, p < 0.001). This finding was supported by the fact that Cohen's d = 2.23. When compared to conventional instruction, this reveals that the use of tools driven by AI is preferable in terms of enhancing speaking skills.

Trends in AI -Generated Analytics

The data from ChatGPT and ELSA Speak contribute to a better understanding of the growth of the experimental group. The most important analytics metrics drawn from the 15 -week intervention are shown in the following table.

Table 4

Analytics metrics drawn from the 15 -week intervention

Metric	Week 1 Mean	Week 15 Mean	% Improvement
Pronunciation Accuracy	58.3%	84.6%	45.1%
Fluency Score	62.1%	88.7%	42.9%
Error Frequency (per min)	5.8	2.1	-63.8%

The assessments of fluency and pronunciation correctness indicated significant improvement; the former showed rises of 45.1% and the latter of 42.9%. Concurrent with a decrease in the requirement for corrective input, speaking skill improved. This resulted in a 63.8% decline in the error count per minute.

Correlation Between AI Use and Posttest Performance

A Pearson correlation analysis was employed to explore the posttest results, which were evaluated based on the amount of time spent using AI technology and the level of engagement with it.

Table 5

Pearson correlation analysis of AI Use and posttest performance

Variable Pair	R	p -value
AI Usage Time vs. Posttest Score	0.78	<0.001

A high positive correlation ($r = 0.78$, $p < 0.001$) indicates that an increased level of interaction with AI technology is associated with an improvement in one's capacity to communicate verbally.

Overall, the speaking scores of the experimental group clearly indicated a relative improvement above the results of the control group. The large effect sizes observed in this research provide some insight into the great impact AI -powered tools have. These findings demonstrate that there is a steady improvement in pronunciation and fluency, as well as a reduction in the number of mistakes that occur over the course of time.

Results of the Qualitative Analysis of AI -Generated Analytics

The results showed complete awareness of the increase in speaking competency of Saudi female EFL learners during a 15 -week intervention. The findings of pronunciation accuracy, fluency, and mistake frequency provide a precise picture of learners' development as well as the language features under goal improvement. The students' qualitative comments added to these findings provided a whole understanding of how AI -powered tools improve speaking skills.

Pronunciation Accuracy

Among the most important areas of development for students in the experimental group was pronunciation accuracy. The students consistently struggled to differentiate several vowel sounds, including /ae/ and /ɪ/, and in using appropriate stress patterns for multi -syllabic words. The first shows in Week 1 an average accuracy rate of 58.3%. Reflecting a clear 45.1% increase, by Week 15 the accuracy rate had climbed to 84.6%.

Statistics showed a consistent increasing trend; the most significant increases were between Weeks 5 and 9. During this period, the weekly improvement rate averaged 3.2 percentage points, compared to 1.8 percentage points in the earlier weeks. This acceleration coincided with targeted pronunciation exercises embedded in the prescribed textbook and supported by ELSA Speak's phonetic feedback. For instance, participants frequently corrected errors such as the improper articulation of diphthongs (e.g., /aɪ/ in "light") and the stress placement in words like "application" and "information," which were flagged in over 70% of initial analytics sessions but reduced to less than 10% by Week 15.

The comments given by students underlined how AI technology may help to solve pronunciation problems. One participant commented, "The application not only informed me

of the errors I was making, but it also gave me examples and opportunities for repeated practice. It affected me personally really significantly."

Fluency

Fluency, which measures the natural flow and coherence of speech, also improved significantly. The average fluency score rose from 62.1% in Week 1 to 88.7% in Week 15, indicating a 42.9% increase. This measure was designed to be a representation of the participants' ability to construct longer, continuous speech segments while simultaneously reducing the number of hesitations, fillers (such as "um," "uh"), and self -corrections.

In the first week of the syllabus, participants spoke an average of 5.2 words each utterance. By the fifteenth week, that average had increased to 8.7 words per utterance. There was also a 64.7% decrease in the number of hesitancies, which went from 3.4 per minute to 1.2 per minute. When ChatGPT included scenario -based conversational exercises, these advantages were particularly clear -cut. On these assessments, students answered questions like "Explain the steps you take to prepare for an exam" or "Describe your ideal vacation". By Week 10 over 85% of students replied rationally, orderly, with little pauses, unlike only 42% in Week 1. Many students attributed their improved fluency to ChatGPT's interactive model. One participant said, "Using the app felt like having a genuine discussion. It gave me confidence as it forced me to react quickly and without second thought."

Error Frequency

Another important result was the drop in error frequency: from 5.8 mistakes per minute in Week 1 to 2.1 errors per minute in Week 15 - a 63.8% change. Grammatical, lexical, and phonological forms of errors were distinguished; all of them clearly improved.

Grammatical Errors

Errors related to subject -verb agreement and tense usage (e.g., "He go" instead of "He goes" or "She have" instead of "She has") were among the most common initial mistakes. These were identified in 78% of learners' early sessions but declined substantially to only 5% by Week 15.

Lexical Errors

From an initial incidence rate of 43% to 12% at the end of the intervention, errors pertaining to word choice and preposition usage also dropped substantially. For example, students first utilized prepositions in phrases like "I am good in math," instead of "I am good at math." By Week 10, corrective feedback from ChatGPT and later practice removed such mistakes in most students.

Phonological Errors

These errors - including incorrect syllable division and mispronunciations - were cut by 67.2%. Over half of students' first sessions identified specific difficulties, including substituting /θ/ with /s/ (e.g., "sink" for "think"). However, by Week 15, this was reduced to fewer than 10%. The real -time mistake feedback the AI tools gave was much valued by the students. One participant

said, "*Seeing my mistakes instantly helped me concentrate on what needed improvement. I corrected less mistakes over time, which inspired me to keep on improving.*"

Sequential Trends

Longitudinal data analysis indicated periods of progress all along the intervention:

Weeks 1 -4 (phase of adaptation). Learners acquainted themselves with the AI tools during this phase, which resulted in only small changes in pronunciation accuracy (+7.5%), fluency (+5.8%), and mistake frequency (-0.9 errors per minute).

Weeks 5 -10 (Phase of acceleration). This period marked the highest gains, with pronunciation accuracy increasing by 17.3%, fluency by 15.6%, and error frequency decreasing by 2.3 errors per minute.

Weeks 11 -15 (Plateau Phase). While gains in pronunciation and fluency slowed, error frequency continued to decline, with a reduction of 0.5 errors per minute per week. This phase reflected learners' focus on refining advanced skills.

Results of the Qualitative Analysis of Focus Groups

The focus group conversations with the experimental group provided insightful qualitative analysis of the learners' impressions, experiences, and difficulties utilizing AI tools - including ChatGPT and ELSA Speak - for enhancing speaking skill. These semi -structured discussions explored themes such as the perceived benefits of the tools, the challenges encountered, and the overall impact on participants' speaking skills.

Perceived Benefits of AI Tools

The focus group conversations underlined various benefits of using technologies driven by AI. With recurrent themes of individualized feedback, lower fear, and more confidence, participants indicated that the tools were vital in improving their speaking skills.

Personalized Feedback. Students benefited much from the fast and customized knowledge available thanks to technologies using AI. This is not the case in normal classroom environments, when remarks are sometimes vague or delayed. Many of the participants underlined how personalized feedback enabled them to identify and resolve recurrent speech issues. "The app corrected my pronunciation mistakes instantly," one student said, therefore preventing him from repeating the same errors. It was like always having a personal teacher right at hand. Another student stressed the need for focused feedback in increasing fluency, "ELSA Speak showed me precisely where I was hesitating too much or speaking too fast. It was honest and clear so I could focus on one issue at a time."

Reduction in Anxiety. The nonjudging character of AI technologies was mentioned as helping to reduce the anxiety over error. Knowing that mistakes would not cause shame, students felt more at ease using AI technologies than in encounters with teachers or peers. One participant shared, "*I didn't feel shy or afraid of making mistakes when speaking with the app. This gave me the courage to practice more and try difficult words or phrases.*" Several students expressed that this reduction in anxiety contributed to more frequent and focused practice

sessions, which were key to their progress.

Increased Confidence. Reduced anxiety combined with tailored feedback produced clear increases in students' confidence. Many of the participants said they were better prepared for real -life talks and classroom discussions. One student said, *"I was always anxious about presenting in front of people before utilizing the tools. But I feel more secure having worked with ChatGPT. I know I talk without hesitation and appropriately say words."*

Enhanced Motivation. The dynamic and interesting character of the tools inspired students to practice more often. The gamified components - progress monitoring and success badges - which made the learning process fun were much valued by many participants. One student said, *"Seeing my development every week kept me motivated. I aimed to achieve the next level and maintain raising my marks."* The rising time students spent practicing alone, as recorded in the use statistics, showed this drive.

Autonomous Learning. AI tools empowered learners to take control of their own learning, allowing them to practice at their own pace and focus on areas where they needed improvement. One participant explained, *"I liked that I could practice anytime and anywhere. It saves me from having to wait for the teacher's correction, and instead, I could correct my mistakes immediately assisted by the app."* Most especially, such autonomy meant much to learners with low confidence in a conventional classroom setting.

Alignment with Classroom Instruction. AI tools created opportunities for students to perform self -directed learning, to practice at their own pace, and to emphasize those areas where their interlanguage was insufficient. As one participant claimed, *"I liked that I could practice anytime, anywhere. I didn't have to wait for the teacher to correct me; I could instantly correct my mistakes with the help of an app."* Such a feeling of agency was particularly meaningful for some of the learners who, due to a lack of confidence, were very loath to speak in the traditional classroom.

Challenges Encountered

Although the focus group discussions reflected predominantly positive experiences, the students also indicated a few associated challenges with using AI technologies. These challenges were primarily of a technical nature, issues of cultural applicability, and/or over -reliance on the AI.

Technical Difficulties. Particularly through the initial weeks of the intervention, the practice sessions were negatively affected by connectivity challenges and sporadic glitches in the system. Some of the student participants expressed obvious frustration at the interruptions in practicing due to either being kicked out of the application or connection issues. One student said, *"I just had to reload sometimes because the program would stop working. So, I would lose my practice and progress and had to start again, it was just frustrating."* Although students reported that these issues occurred less frequently as the learners became used to technology, it still was a prevalent challenge for some.

Cultural Limitations. The AI tools, at times, failed to recognize cultural complexities specific to Saudi learners as AI tools suggested unnatural or culturally irrelevant prompts to learners. For example, some students reported receiving English language phrases with idioms

or conversational vernacular expressions as part of the activity, which was largely absent from Saudi environments. One student explained, *"Chatgpt was suggesting phrases that were not remedial to how we speak in Saudi Arabia. So, it was confusing because I was not sure if I should even use them or just stick to what I knew."* The implication here was the need towards localized AI and tool design and cultural approaches to ensure authenticity and relevance within the prompts and learning.

Overreliance on Formal Language. Another challenge was the inherent tendency of the AI tools to focus on formal language structures with some learners expressed that this is not a common way to practice the language when reaching an informal conversational speech act. One student said, *"The app really taught me form, and like any good app, it taught me great pronunciation, but it didn't really teach me to speak in a casual way, like if I was talking to friends."* The tendency towards overemphasis on contextual formality sometimes caused a disconnect between how the students would or could communicate with each other in real -world conversations.

In summary, the findings from the focus group data demonstrate the transformative potential of AI -powered tools in helping learners develop their speaking skills. The key drivers for learners' progress were personalized feedback, decreased anxiety, and increased confidence, which allowed students to overcome common barriers to speaking proficiency. Students' qualitative feedback also provided context for quantitative improvements, indicating specific ways that AI tools help learners progress. For example, students' capacity to get instantaneous corrections and practice repeatedly without regard to evaluation directly correlated with the decrease in mistake frequency recorded in the analytics.

Thus, the qualitative analysis of focus group discussions underlines the need for the use of AI -enabled tools to enhance the speaking skills of Saudi female EFL learners. Provided with personalized and instantaneous feedback in a caring and flexible environment – some of the key barriers to language acquisition, including anxiety and limited practice time – tools like ChatGPT and ELSA Speak are particularly well -placed for this purpose. In the same breath, however, the findings also reveal areas that require further improvement: surmounting technical glitches and cultural relevance.

These have altogether given clear responses to the two research questions that AI -powered tools contribute much to Saudi female EFL learners in their improvement of speaking skills and reveal both prospects and problems related to their use. The AI technologies of ChatGPT and ELSA Speak underpin speaking skill development by providing individual feedback that fosters autonomous learning in anxiety -free conditions. This seemed to have translated into improved confidence and motivation on the part of the students, culminating in measurable improvements in speaking performance.

Further, the tools facilitated improvement in pronunciation accuracy, fluency, and overall communicative competence in line with the classroom goals of teaching speaking. However, several shortcomings were identified regarding technical problems, irrelevance to the culture, and strongly overemphasized formal language, pointing to the necessity of further refinement. Stronger correlations between engagement and performance measures underlined the transformative potential of AI -based applications and complemented qualitative insights into

how improvement mechanisms come into play. Results have underlined the potential of AI technologies to surmount some of the main stumbling blocks to speaking proficiency, offering friendliness and flexibility in learning, whereby students make significant gains in language acquisition.

Discussion

This study offers an overview of how AI -driven technologies may enhance speaking skills in Saudi female EFL learners. To indicate the overall growth among students, the study has presented the pre -test and post -test scores along with data from AI and insights provided in focus groups. Quantitative data indicated substantial enhancement in speaking skills. AI analytics strongly supported the fact that from 62.45, the experimental group post -test scores gained 17.37 points to 79.82. Besides, it was shown that there was a 45.1% increase in pronunciation accuracy, 42.9% in fluency scores, and a 63.8% decrease in language errors. Such findings clearly show how well these tools target specific deficits noticed at the pretest stage, including limited vocabulary and the mispronunciation of vowels. The relationship of the pretest and posttest findings with the AI analytics underlines reliability and accuracy of the intervention applied; as such, it provides a good basis for growth assessment. This systematic improvement underlines what AI can add to traditional classroom instruction by giving personalized help, tuned to the special needs of students.

Gains in fluency were particularly striking, as evidenced by AI analytics of hesitations going down from 3.4 to 1.2 per minute and an increase in lengths of runs of uninterrupted speech, from 5.2 to 8.7 words per utterance. The same findings emerged in the post -test assessments where students had consistently higher fluency scores across the CEFR. The ability of the tools to offer conversation prompts, as seen in ChatGPT through scenario -based tasks, was central to facilitating spontaneous and cohesive speech -generation. Students regularly indicated that working with ChatGPT resembled an authentic conversation, allowing them to practice responding rapidly and organizing their thoughts.

The findings are congruent with Hobert and Meyer von Wolff (2019), and Ruan et al. (2019) illustrating the welcomeness of AI -powered conversational agents to improve fluency. Of these, fluency revealed the most significant gain: from 3.4 to 1.2 hesitations per minute, with corresponding increases in the length of unbroken utterances, going up from 5.2 to 8.7 words per utterance. The gains found their way into the post -test, where students obtained consistently higher ratings in fluency, in the three dimensions under the CEFR. This is also a potential of tools such as the scenario -based tasks embedded in ChatGPT, through the conversational cues that elicit spontaneous, coherent speech. Many students reported that the experience of talking with ChatGPT was closer to real life, and it taught them how to respond quickly and say what they wanted. In the words of one learner, "Practicing with ChatGPT helped me respond quickly and organize my ideas, making me more confident during class discussions."

The findings also concur with Jamshed et al. (2024), who observed that the use of AI -driven conversational agents could enhance fluency. The current study goes a step further in identifying actual links between the state of fluency development and the underlying cognition -alleviating speech production factor facilitated by iterative practices and immediate feedback. The results provide an addition to the existing literature concerning improvements in fluency by

linking this gain in fluency to specified features of the tools used. Unlike Obari (2020), focused on interactions using only chatbots, the present research emphasizes the synergy created with the varied AI tools used together with structured classroom activities - pointing toward more holistic ways of fluency enhancement.

The findings reflect the effectiveness of AI -powered tools. For instance, the average scores increased from 58.3% to 84.6%, reflecting considerable improvements in areas such as diphthong articulation and placing of stress in a multisyllable word. Further, AI analytics break down such development, depicting how such pronunciation got naturally internalized overtime. For instance, error rates in such phrases as "He go to school" dropped significantly from 78% in Week 1 to only 5% by Week 15, reflecting consistent improvement across time. These results are further contextualized in focus group discussions where, for instance, learners identified detailed and actionable feedback from tools like ELSA Speak.

This effect has also been pointed out in classroom interaction. For instance, students mentioned a remarkable improvement in oral presentations, in which they pronounced clearly and needed fewer corrections. These observations also agree with the quantitative data in showing how such tools create incremental and sustained improvement. Whereas these are similar to the results by McCrocklin (2019) and Kholis (2021), where the pronunciation accuracy is enhanced through AI tools, this study elaborates more on the specification of the distribution of categorization of errors into grammatical, lexical, and phonological difficulties. This granularity not only enriches the understanding of AI tools' impact but also offers practical insights for educators and developers aiming to design more targeted interventions.

Learner autonomy and motivation emerged as additional dimensions of the AI tools' impact. Focus group discussions revealed that the tools' features, such as progress tracking and gamified elements, played a critical role in sustaining learners' engagement and encouraging independent practice. Indeed, students also mentioned that during classes, they were more active, eager to be given feedback, and to create more opportunities for themselves to speak, whereas learners in the control group relied more on the teacher. These findings are further reinforced by Krashen's Affective Filter Hypothesis (1982), which stated that a decrease in anxiety automatically facilitates language acquisition. Even greater willingness to communicate – this arguably being the most desirable result of the integration of AI tools into the process of learning – has likewise been pointed out here, much as it was by Jamshed et al. (2024). This current research adds to that in a different dimension by identifying the role of learner autonomy as a mediating factor. The tools create avenues for self -directed learning and greater responsibility of learners for their progress, thus extending the possibility of impact beyond the classroom itself.

Meanwhile, there are many challenges that learners pointed out that need attention; for instance, in some places, technical issues such as internet connectivity problems disrupted practice sessions, while cultural irrelevance from some of the general AI language models impeded progress. These challenges underscore the demand for culturally adaptive AI tools that have locally relevant conversation prompts and a solid technical infrastructure to enable uninterrupted access. Another significant role that teachers undertake is the contextualization of the information that AI inputs provide through a wider educational lens to avoid possible

impediments for students.

While these challenges present parallels to those found by Hwang et al. (2020) and Cowie and Alizadeh (2022) in Saudi EFL contexts, this study is novel in examining how such barriers exist in connection to students' experiences, and in providing suggestions for improving them. The study provides a flexible stance on the complexity of AI use, which can counter the implementation barriers in various educational contexts, by incorporating both qualitative and quantitative findings.

Conclusions and Implications

The findings of this research support the possible change that AI -driven technologies like ChatGPT and ELSA Speak might cause regarding main challenges discovered among Saudi female EFL learners in gaining speaking competency. Creating customized, adaptable learning environments, these technologies showed promise to effectively support traditional teaching strategies. The main outcomes highlight how much AI helps to produce the elements of learner autonomy, lower fear, and encourage consistent practice.

One central implication of this is that AI tools might place the development of an individual's language into his or her hands: whereas the recognition and working on concrete weaknesses may be helped effectively through immediate, personalized feedback given with the tools in a self -determined tempo, it enhances self -directed learning. A move toward enhanced learner independence also follows from contemporary pedagogies emphasizing active learning and personalized practice. In maximum development of this effect, educators will need to construct instructional frameworks that incorporate AI tools into language curricula, enabling learners to expand class practice into independent learning.

Another key implication in designing AI tools is noted to be cultural relevance. Although tools are consistently helpful in enhancing pronunciation, fluency, and reduction of errors among learners, some minor cultural mismatches in the conversational prompts revealed the potential for localized adjustments. AI developers should collaborate with educators and linguists in adjusting the content to the unique cultural and linguistic environment in which learners use a language, allowing learners to practice authentic language but appropriate for the context. Modifications like this would very well improve the learning experience and make AI tools even more inclusive and accessible.

These results again suggest that AI tools hold immense promises for diminishing affective barriers to language learning, such as anxiety and fear of judgment. Because the tools are nonjudgmental in nature, they encourage learners to try out the language and make mistakes without feeling any embarrassment; hence, they provide a more supportive context for learning. A reduction in anxiety greatly enhances the learner's willingness to communicate, considered one of the crucial variables in language acquisition. Indeed, instructors can build on these experiences in the classroom by designing classroom contexts that reflect the supportive and low -pressure context created by the AI tools.

Along with financial support, institutional level planning of integration of AI technologies in EFL programs must be carefully coordinated. Strong technological infrastructure may help to solve technical challenges found in the research and problems of connection. Training courses on

how to employ AI technologies within the classroom should also be provided for teachers. Such training would provide them with knowledge on how to build activities based on AI, apply the technologies, and evaluate analytics data to reach curricular goals.

The present study contributes to an integrated quantitative -qualitative data analysis, which is novel within the incipient area of inquiry on AI in language learning. Noticeably, whereas previous studies emphasized the efficiency of AI tools, the present research enables deeper insight into the relationship among learners' perceptions, the functionality of tools, and instructional outcomes. Such types of insights are necessary and need to be furthered through future research by focusing on the long -term impact of these tools on language proficiency as well as their transferability in real -life communication. Also, scaling up the intervention in the AI tools with respect to the learner population and educational context, may yield insight that proves valuable for larger -scale implementations.

Finally, incorporation of AI -driven tools into EFL speaking skills training promises a new frontier in surmounting at least two major bottlenecks: insufficient practice opportunities and learner anxiety. When provided with autonomous but guided practice, such tools are strong support for mainstream pedagogies, motivating incremental improvement. Whether that will happen depends on sensitive integration, cultural adaptation, and continuing teacher training. With continuous improvement in AI technologies, it seems that the way languages will be taught may be fundamentally reshaped for a personalized, accessible future and truly effective for all learners.

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Biographical Statement	معلومات عن الباحث
Dr. Ebtisam Waheeb Abdullah Al -Waheebi is an Associate Professor of Applied Linguistics in the English Unit at the Applied College, Shaqra University, Saudi Arabia. She ereceived her Ph.D. in Applied Linguistics from Imam Mohammed ibn Saud Islamic University in 2020.Her research interests revolve around issues in second language acquisition, language pedagogy, sociolinguistics, and the integration of technology in language learning. She is particularly interested in exploring innovative approaches to English language teaching within higher education contexts, and in investigating the impact of cultural and social factors on language use and learning outcomes.	د. ابتسام وهيب عبد الله الوهيبي أستاذ مشارك في اللغويات التطبيقية بوحدة اللغة الإنجليزية في الكلية التطبيقية بجامعة شقراء، المملكة العربية السعودية. حصلت على درجة الدكتوراه في اللغويات التطبيقية من جامعة الإمام محمد بن سعود الإسلامية في عام 2020.تتركز اهتماماتي البحثية حول قضايا اكتساب اللغة الثانية، وطرائق تدريس اللغات، وعلم اللغة الاجتماعي، وتكامل التكنولوجيا في تعليم اللغات. كما تهتم بشكل خاص باستكشاف الأساليب المبتكرة في تدريس اللغة الإنجليزية في مؤسسات التعليم العالي، ودراسة تأثير العوامل الثقافية والاجتماعية على استخدام اللغة ونتائج تعلمها.

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