



Enhancing EFL Learners’ Speaking Skills through AI-Assisted Interventions: A Statistical Evaluation

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ABSTRACT

This study investigates the effectiveness of artificial intelligence (AI) technologies in enhancing English as a Foreign Language (EFL) learners’ speaking competence through systematic instructional tasks. A structured trend analysis over six weeks was conducted to examine learners’ progression in overall speaking performance and specific skills including grammar, pronunciation, and communication. Repeated measures analysis of variance and inferential statistics demonstrated significant improvements in learners’ performance. The findings indicate that AI-supported interactive tasks can effectively enhance multiple dimensions of speaking competence in higher education. The study concludes that AI integration contributes to more personalized and efficient language learning environments.

Keywords:

artificial intelligence, EFL speaking competence, trend analysis, repeated measures, language education technologies

Introduction. Speaking competence is a critical domain of English as a Foreign Language (EFL) education, yet many learners struggle to achieve proficiency due to limited practice opportunities and insufficient individualized feedback. Recent advancements in artificial intelligence (AI) have introduced interactive platforms that provide adaptive speaking practice, real-time corrective feedback, and context-based learning support. Platforms such as **Replika, TalkPal, ELSA Speak, Speechling, Kialo Edu, and Speechace** offer diverse functionalities, including conversational simulations, pronunciation evaluation, and scaffolded learning pathways, enabling learners to engage in personalized speaking practice beyond traditional classroom settings. These AI technologies have the potential to transform conventional language instruction by integrating personalized learning pathways into speaking skill development. By leveraging the feedback and adaptive features of these platforms, EFL learners can participate in

repeated, scaffolded speaking exercises, facilitating incremental improvement in fluency, accuracy, and confidence. The present study investigates the trend in EFL learners’ speaking performance over a defined period while engaging with AI-assisted tasks on these platforms. The statistical significance of observed improvements is evaluated using repeated measures analysis and other inferential methods, providing quantitative evidence on the effectiveness of AI-supported interventions in enhancing speaking skills.

Methods. The study involved 30 undergraduate EFL learners at Navoi State University, equally divided by gender (15 male, 15 female). All participants were at an intermediate level of English proficiency, determined through placement testing. Learners engaged in AI-assisted speaking tasks over a six-week period using platforms such as Replika, TalkPal, ELSA Speak, Speechling, Kialo Edu, and Speechace. Weekly speaking performance was assessed

through structured oral tasks, and scores were recorded for overall competence as well as specific subdomains (grammar, pronunciation, communication)

A pre-post design was employed to evaluate learners' progression. Speaking scores from the initial stage (Week 1) and final stage (Week 6) were compared to determine the significance of improvement. In addition, categorical improvements in specific competencies (grammar, pronunciation, communication) were analyzed to assess reliability.

Statistical Procedures

Student's t-test Applied to compare mean speaking scores before and after the intervention, determining whether the observed improvement in performance was statistically significant.

Fisher's Exact Test Used to evaluate the reliability of improvements across categorical competencies (e.g., pronunciation clarity, grammatical accuracy), ensuring that the probability of observed changes occurring by chance was minimal.

Data Analysis

All statistical analyses were conducted using SPSS 26.0. Significance levels were set at $p < 0.05$. Descriptive statistics (mean, standard deviation) were calculated for each week, while inferential tests confirmed the robustness of observed improvements.

Results Weekly Trend in Overall Speaking Performance

Table 1 shows learners' mean scores for each week. The progressive improvement from Week 1 to Week 6 is evident. ANOVA results indicated a statistically significant effect of time on overall performance ($F(5,145)=12.67, p<0.001$).

Table 1. Weekly Mean Scores of Overall Speaking Performance

Week	Mean Score	SD
1	55.2	6.1
2	60.4	5.8
3	64.7	5.3
4	69.2	5.0
5	73.5	4.8
6	78.1	4.6

Competency-Specific Improvements

The table below presents trends in grammar, pronunciation, and communication skills over six weeks.

Table 2. Weekly Scores by Competency

Week	Grammar	Pronunciation	Communication
1	54.3	55.1	56.2
2	59.5	60.0	61.7
3	63.1	65.0	65.9
4	67.8	68.2	70.3
5	72.0	73.1	74.2
6	76.5	77.0	79.0

Fisher's exact test confirmed that the probability of observed improvements occurring by chance was <0.01 for all competencies.

Discussion. The results indicate that the use of AI technologies in language instruction enhances learners' speaking performance over time. Engagement with AI-based platforms such

as **Replika, TalkPal, ELSA Speak, Speechling, Kialo Edu, and Speechace** led to statistically reliable gains in both general speaking competence and specific skills such as

pronunciation, fluency, and contextual appropriateness. Learners benefited from real-time corrective feedback and adaptive tasks tailored to their proficiency, promoting more individualized practice than traditional classroom instruction alone [7; 134–136 p.].

The dynamic assessment framework used in this study emphasizes the value of integrating AI to complement conventional teaching in higher education. Repeated measures analysis confirmed that improvements were consistent and measurable, suggesting that AI-assisted speaking practice can effectively support learner autonomy and skill development. These findings are consistent with previous research highlighting the role of AI in providing personalized feedback and enhancing oral proficiency [8; 45–56 p.].

Conclusion AI-supported instructional tasks effectively enhance EFL learners' speaking competencies as evidenced by significant trends in performance over a six-week period. The combination of repeated measures analysis and inferential testing provides robust evidence that interactive AI platforms facilitate measurable improvements in grammar, pronunciation, and communicative skill areas. The findings underscore the value of integrating AI technologies into language education to promote learner autonomy and personalized practice.

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