

Enhancing EFL Students' Speaking Skills through Augmented Reality: A Pre-Experimental Study

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Abstract: This study investigated the effect of Augmented Reality (AR) on the speaking skills of ninth-grade students at Insan Qur'ani Junior High School. The study addressed the problem of students' low speaking proficiency, particularly in pronunciation, fluency, grammar, and vocabulary. A quantitative pre-experimental design employing a one-group pre-test and post-test approach was used. The participants consisted of ten ninth-grade students. Speaking performance tests using a rubric adapted from Brown (2004) were used to collect the data. The treatment comprised three meetings employing AR-based learning activities focused on animal descriptions. Data were analyzed by descriptive statistics, validity and reliability tests, normality testing, and paired-sample t-tests. The results showed that the mean score of students' speaking improved from 61.00 in the pre-test to 81.50 in the post-test. The paired sample t-test found a statistically significant difference between the pre-test and post-test scores ($p < .001$), indicating that AR had a significantly positive effect on the students' speaking achievement. Improvements were found on all speaking indicators such as pronunciation, fluency, grammar, and vocabulary. The study found that AR provided a contextualized and interactive learning environment that encourages speaking development and enhances students' participation and confidence in learning English.

Keywords: Augmented Reality, Speaking Skills, EFL learning, Educational Technology, Junior High School

INTRODUCTION

Speaking is considered as one of the most important skills because it enables the learners to express ideas, opinions and information effectively. Although it is important, many students find it difficult to speak English. The problems are often the mispronunciation, limited vocabulary, grammatical errors, lack of fluency, and low self-confidence. These problems often make students unable to actively participate in classroom discussions. Traditional teaching methods sometimes cannot give students real chances to practice speaking in real and engaging settings.

The rapid development of educational technology has encouraged teachers to integrate innovative and creative digital media in language learning. Technology-enhanced learning environments have been shown to foster creativity, collaboration, problem solving, and meaningful learning experiences that support students' active participation (Bereczki & Kárpáti, 2021). Among the media, Augmented Reality (AR) has gained considerable attention. AR is defined by Azuma (1997) as a merger of virtual elements with the real world where users can manipulate digital contents while remaining engaged with the real world. AR provides visual and interactive experiences that can promote significant learning and enhance the students' participation.

Recent studies have indicated the positive effects of AR on language learning. Schorr et al. (2024) found that AR can foster contextual learning, and increase learners' engagement in foreign language learning. Yang and Zhang (2024) also found that AR has a significant effect on EFL learners' language achievement in various language skills. Wang (2024) further found that AR-assisted learning has a positive effect on learners' oral proficiency, including pronunciation, fluency, grammar and vocabulary.

Augmented Reality has recently shown a positive contribution towards language learning outcomes in terms of oral proficiency, learner engagement, and language achievement. However, most AR-related studies have focused on vocabulary learning, higher education settings, or overall language achievement. Speaking skills of

junior high school students have been paid less attention, especially in the Indonesian Islamic educational context. Therefore, more empirical evidence is needed to explore the effectiveness of AR on improving specific speaking components such as pronunciation, fluency, grammar, and vocabulary among EFL learners.

The effectiveness of AR in language education has been demonstrated in previous studies, but there is still little research in the Indonesian Islamic Junior High School. Furthermore, studies examining AR's influence on specific speaking components among junior high school students are still scarce. Therefore, this study aimed to investigate whether Augmented Reality significantly improves the speaking skills of ninth-grade students at Insan Qur'ani Junior High School. Specifically, this study seeks to answer the following questions: 1) What are the students' speaking skills before being taught using Augmented Reality(AR) at the ninth grade of Insan Qur'ani Junior High School? 2) What are the students' speaking skills after being taught using Augmented Reality (AR) at the ninth grade of Insan Qur'an Junior High School? 3) Is there a significant effect of using Augmented Reality (AR) on the speaking skills of ninth-grade students at Insan Qur'ani Junior High School?

Previous studies have established the effectiveness of Augmented Reality (AR) in language learning, yet research on the implementation of AR in Indonesian Islamic junior high schools is still limited. Moreover, studies on the effect of AR on specific components of speaking are still scarce. Speaking is a difficult skill for EFL learners, particularly in terms of pronunciation, fluency, grammar and vocabulary, and requires innovative instructional methods to assist in speaking development. Therefore, this study investigated the impact of AR on the speaking skills of ninth grade students at Insan Qur'ani Junior High School by analyzing their speaking performance before and after AR-assisted instruction. The results lend empirical support for the effectiveness of AR in enhancing students' speaking performance and practical recommendations for English teachers to implement AR-based speaking instruction to boost students' engagement, confidence, and communicative competence.

LITERATURE REVIEW

Speaking Skills

Speaking is a productive language skill and it is the ability to express ideas and information orally. According to Brown (2004), speaking performance consists of four major components: pronunciation, fluency, grammar and vocabulary. Pronunciation is related to the accurate production of speech sounds, fluency refers to the smooth and uninterrupted flow of speech, grammar is concerned with the appropriate use of language structures and vocabulary is the range of words available for communicating. In order to communicate successfully, learners must combine these components. Therefore, the teaching of speaking should provide students with opportunities to practise language in real life.

Speaking instruction should also encourage meaningful communication through authentic classroom interaction rather than focusing solely on linguistic accuracy. Teachers need to provide opportunities for students to use English in real communicative situations so that they can develop confidence and communicative competence (Brown, 2001; Nunan, 2003).

Augmented Reality in Language Learning

Augmented Reality (AR) is an interactive experience in which computer-generated information is overlaid on the real-world objects (Azuma, 1997). Recent developments indicate that mobile Augmented Reality has become increasingly accessible in educational settings because of advances in smartphone technology and interactive visualization (Azuma et al., 2011; Chen et al., 2019). Virtual Reality immerses users in a fully virtual world, however Augmented Reality augments the real-world.

The popularity of AR in education is due to its ability to generate interactive and learner-centered experiences. The quality of users' learning experiences also plays

a crucial role in determining the effectiveness of AR. A systematic literature review by Graser et al. (2024) concluded that positive user experience—including usability, engagement, immersion, and interaction quality—is one of the key factors influencing the successful implementation of AR in educational environments. These characteristics make AR particularly suitable for speaking instruction, where active participation and meaningful interaction are essential. Schorr et al. (2024) pointed out that AR supports contextual learning and enhances student engagement through visualization and interaction. Yang and Zhang (2024) reported that AR-supported instruction plays an important role in the development of EFL learners' language.

AR provides a context for learning in speaking instruction by offering visual stimuli that allow learners to describe, explain and talk about objects they see, and to generate ideas, thereby making communication meaningful.

Previous Studies

The effectiveness of AR in language learning has been studied in many studies. Wang (2024) found that AR significantly improved EFL learners' oral proficiency. Likewise, Yang and Zhang (2024) reported positive effects of AR on language achievement through a meta-analysis. AR also encourages active participation and engagement of the learner (Schorr et al., 2024).

Despite these findings, few studies have investigated AR implementation among Indonesian Islamic junior high school students. Thus, this study adds more evidence of the effectiveness of AR in improving speaking skills in this educational context.

METHODOLOGY

This study employed a quantitative pre-experimental design using a one-group pre-test and post-test approach (Creswell, 2014; Ary et al., 2010). The procedures of conducting educational research, including participant selection, instrument

administration, and data collection, also followed the general principles suggested by Arikunto (2002).

The participants consisted of all ninth-grade students enrolled at Insan Qur'ani Junior High School (N = 10), consisting of five males and five female students. Total sampling was employed because the entire population of ninth-grade students consisted of only one class with ten students. Before participating in the study, all students had received formal English instruction for approximately one year during elementary school and had continued studying English for nearly three years at the junior high school level. Consequently, they possessed basic knowledge of English vocabulary and grammar but still experienced difficulties in speaking, particularly in pronunciation, fluency, grammatical accuracy, and vocabulary use. Data were collected through speaking performance tests administered before and after the treatment. Students' speaking performances were evaluated based on pronunciation, fluency, grammar, and vocabulary using a speaking rubric adapted from Brown (2004).

The sample size was relatively small because the ninth-grade class at Insan Qur'ani Junior High School consisted of only ten students, and all students in the class were included as the research participants using total sampling. Although a small sample limits the generalizability of the findings, it is acceptable for a pre-experimental classroom study that aims to investigate the preliminary effectiveness of an instructional intervention within a naturally occurring educational setting (Ary et al., 2010; Creswell, 2014)

This research was conducted in May for 2 weeks in five meetings which included pre-test, treatment, and post-test. The treatment was conducted utilizing AR-based learning activities. Students scanned AR markers using smartphones to see three-dimensional animal models. Students analyzed with virtual animals, describing their characteristics, habitats, behaviors and appearance. The researcher guided and provided feedback during the learning process.

The data were analyzed using IBM SPSS Statistics. Descriptive statistics were used to compute the means of the scores. The validity of the instrument was determined using Pearson Product Moment correlation, while the reliability was measured using Cronbach's Alpha. The Shapiro-Wilk test was used for testing the normality of the data. Paired sample t-test was used for the hypothesis testing.

FINDING AND DISCUSSION

Findings

The results indicated substantial improvement in students' speaking performance after the implementation of AR.

Table 1.1

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	61.00	10	9.068	2.867
	Posttest	81.50	10	7.091	2.242

Source: SPSS Output

The mean score increased by 20.50 points after the treatment. At the beginning, the students had a fair level of speaking ability, but they reached an excellent level after doing AR-assisted learning activities.

Table 1.2

Speaking Indicators	Max Correct	Pre-Test Mean	Post-Test Mean	Gain
Pronunciation	5	2.9	4.2	1.3
Fluency	5	2.5	3.7	1.2
Grammar	5	3.4	4.3	0.9
Vocabulary	5	3.4	4.1	0.7

Source: Research Data

All the speaking indicators improved after the treatment. The greatest improvement was seen in pronunciation and the least in fluency, but all components improved positively.

Table 1.3

Paired Samples Test										
		Paired Differences							Significance	
		95% Confidence Interval of the Difference					t	df	One-Sided p	Two-Sided p
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper				
Pair 1	Pretest - Posttest	-20.500	4.378	1.384	-23.632	-17.368	-14.807	9	<.001	<.001

Source: SPSS Output

The significance value was lower than 0.05, indicating a statistically significant difference between students' speaking scores before and after the implementation of AR.

Discussion

The findings demonstrated that Augmented Reality significantly improved students' speaking skills. The increase in the mean score from 61.00 to 81.50 suggests that AR-assisted learning provided effective opportunities for students to practice speaking in meaningful contexts. Students became more confident, active, and motivated during classroom activities.

The findings are consistent with Wang (2024), who reported significant improvements in learners' oral proficiency after participating in AR-assisted language learning activities. Similar to the present study, learners demonstrated improvements in pronunciation, fluency, grammar, and vocabulary because AR provided contextualized opportunities for language production.

Furthermore, Yang and Zhang (2024) concluded through a meta-analysis that AR positively affects EFL learners' language gains across different educational settings. The present findings reinforce this conclusion by demonstrating the effectiveness of AR among Indonesian junior high school students.

The increased student participation observed during the treatment sessions also supports the findings of Schorr et al. (2024), who emphasized that AR promotes active engagement through interactive and contextual learning experiences. The visual support

provided by AR-enabled animal models helped students generate ideas more easily and reduced hesitation during speaking activities.

Additionally, students appeared more confident when delivering oral descriptions after the treatment. This finding aligns with Jim et al. (2025), who reported that AR-based speaking environments can contribute to confidence development by providing learners with safe and interactive opportunities to practice speaking

The improvement across pronunciation, fluency, grammar, and vocabulary supports Brown's (2004) framework of speaking competence. Through repeated speaking practice supported by visual and contextual stimuli, students developed greater accuracy and fluency in oral communication. The three-dimensional animal models helped learners generate ideas more easily and encouraged them to use English more actively.

The findings are also consistent with Azuma's (1997) theory that AR enhances learning by integrating virtual and real-world environments. In the present study, students interacted with virtual animals displayed through AR markers, which facilitated comprehension and idea generation. The visual support reduced students' hesitation and increased their willingness to communicate.

Furthermore, the results align with recent studies reporting the effectiveness of AR in language learning. Wang (2024) found that AR improves oral proficiency, while Schorr et al. (2024) emphasized its role in promoting contextual learning and engagement. Similarly, Yang and Zhang (2024) concluded that AR positively affects language achievement across educational settings.

The findings also support the view of Bereczki and Kárpáti (2021), who argued that technology-enhanced learning environments promote creativity, active learning, and meaningful student engagement. Through interactive three-dimensional visualization, AR encouraged learners to generate ideas more easily and communicate more confidently. Furthermore, the positive learning experience observed in this study is consistent with Graser et al. (2024), who emphasized that user experience factors such

as immersion, usability, and engagement are critical to the educational effectiveness of AR applications.

The small sample size and absence of a control group were the study's limitations. It is advised that future research examine the efficacy of augmented reality (AR) in teaching spoken English as a foreign language (EFL) using larger samples and more exacting experimental designs. Despite of the limitations, the present study provides additional evidence that AR can be effectively integrated into junior high school speaking instruction

CONCLUSION

The study related to the use of Augmented Reality in teaching speaking. The findings revealed that the use of Augmented Reality significantly improved the students' speaking skills (mean score increased from 61.00 to 81.50 and paired-sample t-test was statistically significant, $p < .001$). The intervention was effective in all the domains of speaking, with the highest improvement in pronunciation than in fluency and grammar and vocabulary respectively. So, Augmented Reality enabled interactive and context-based learning experiences which fostered active participation and engagement leading to increased self-confidence and motivation among students in speaking English. Therefore, AR can be considered as an effective instructional tool in improving speaking skills among EFL learners.

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