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TRANSFORMING AND EVALUATING EFL SPEAKING SKILLS WITH AUGMENTED REALITY: AN AR-BASED MODULE APPROACH

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This study explores AR technology's role in assessing EFL students' speaking skills, aiming to enhance language learning experiences. Its main objective is to design and validate an AR-based assessment module for evaluating speaking proficiency. Employing a mixed-methods approach, the research investigates AR's impact on student engagement, learning outcomes, and language proficiency. It involves forty-five EFL learners from IAIN Fattahul Muluk Papua, using both quantitative and qualitative methods to collect data, including pre-tests, post-tests, interviews, and observations. The AR-based module integrates technology into authentic assessment scenarios, offering immersive learning experiences. Results show a significant improvement in post-test scores, with the mean score increasing from 2.4 (pre-test) to 3.9 (post-test), indicating the module's efficacy. The paired-samples t-test revealed a significant difference ($t(59) = -10.24$, $p < .001$) between pre-test and post-test scores. Qualitative insights highlight increased engagement, positive experiences, and enhanced confidence among students. These findings underscore AR's potential in language education, particularly in speaking assessment. The integration of AR-based modules presents a promising approach for enhancing language teaching and learning, providing immersive experiences. This has implications for educators and practitioners seeking innovative language assessment methods.

Keywords: *Augmented Reality (AR) technology; AR-based assessment module; speaking proficiency; EFL learners; mixed-methods approach; student engagement; learning outcomes; language proficiency.*

INTRODUCTION

In today's globalized world, proficiency in English speaking skills is paramount for effective communication (Zein et al., 2020; Sulistyaningrum & Sumarni, 2023; Qu, 2023). However, acquiring and evaluating these skills in English as a Foreign Language (EFL) classes remains a significant challenge (Olwi, 2020; Seden & Roman, 2019; Wu et al., 2021). Traditional methods of teaching and assessment often fall short in providing the immersive experiences that are essential for mastering oral communication (Chan, 2021; Khalaf & Zin, 2018; Maruf & Helingo 2022). This necessitates the exploration of innovative pedagogical tools that can bridge this gap.

This research delves into the potential of Augmented Reality (AR) as a dynamic solution to enhance and assess speaking abilities within EFL contexts. By harnessing AR technology, we propose an educational framework that introduces authentic simulation scenarios, closely replicating real-life interactions. This immersive environment not only bolsters speaking proficiency (Dhimolea et al., 2021; Gruber & Kaplan-Rakowski, 2022; Lan, 2020 ; Maruf & Anjely 2020), but also revolutionizes the assessment paradigm through the development of an AR-based Assessment Module (Chu et al., 2019; Lau & Wen, 2021; Maruf et al., 2023). This module aims to create evaluations that mirror genuine communicative instances, thus offering more accurate and practical measures of a student's spoken capabilities.

Our approach transcends traditional pedagogies, paving the way for instruction and evaluation that are interactive, contextual, and above all, reflective of real-world conversational challenges. By integrating AR into both learning and assessment processes, we provide learners with essential exposure and practice that prepare them not just for tests, but for the nuanced demands of actual English communication.

To enhance students' English speaking skills through the innovative application of AR technology and to validate the effectiveness of an AR-based assessment module in capturing their speaking proficiency, incorporating AR into speaking activities, the study aspires to impart a level of confidence and preparedness in learners, enabling them to navigate the complexities of diverse and intricate English-speaking contexts

with ease.

Consequently, educators can leverage this approach to facilitate a more animated and student-centered learning experience. The anticipated result is a pedagogical model that not only quantifies the impact of AR technology on speaking skills development but also yields an assessment mechanism that reflects the intricacies of real-world communication. In essence, this study aims to redefine the landscape of EFL speaking proficiency through the lens of augmented reality, offering a novel avenue for educational advancement and student empowerment.

The adoption of technology in education, particularly Augmented Reality (AR), has been extensively explored in recent years, evidencing a paradigm shift towards more immersive learning experiences (Koumpouros, 2024; Dhimolea et al., 2021; Dhimolea et al., 2022; Gruber & Kaplan-Rakowski, 2022; Lan, 2020). In the domain of language education, researchers like Klopfer and Squire (2008) have underscored the utility of AR in fostering engagement and motivation among learners. Li and Wong (2021) provided a comprehensive review that highlighted AR's ability to merge real and virtual worlds, offering interactive experiences that can enhance learning outcomes.

In EFL contexts, the struggle to simulate authentic conversational settings has been a recurring theme (Fan et al., 2020; Markouzis et al., 2022; Schorr et al., 2024; Arifin et al., 2022). Jang et al. (2021) posited that AR can significantly contribute to situational language teaching, a viewpoint corroborated by the work of de Vries et al. (2023) who found that AR applications can create contextual learning environments conducive to language acquisition. However, the assessment of speaking skills within AR-integrated frameworks remains under explored. While there are studies that have assessed AR's impact on learner motivation and vocabulary acquisition (Liao et al., 2024; Taşkıran, 2018; Maruf 2023), fewer have specifically investigated its role in evaluating oral proficiency.

Recent efforts by Koumpouros (2024) have begun to shed light on AR's capacity to enhance the assessment of language skills by providing a more authentic and engaging context for students to demonstrate their abilities. Despite this nascent area of focus, the assessment of speaking skills via AR technology indicates promising directions (Kessler, 2018; Lavolette, 2022; Shadiev & Yang, 2020; Mujayanah et al., 2023). Pennington & Revell (2019; Qiu et al., (2023); Zhu et al., (2022) explored AR's potential in improving pronunciation and found that its interactive nature allowed for more personalized and immediate feedback, a key component in language proficiency development. Moreover, the integration of AR into communicative language teaching, as explored by Chang et al., (2020) suggests that AR's simulation capabilities can extend to performance-based assessments, offering nuanced insights into learners' communicative competencies.

This study builds upon these foundational works by intricately studying the integration of AR in assessment modules. It further seeks to contribute to the field by not only harnessing the technological affordances of AR for improving speaking skills but also in crafting a research-based assessment module designed to evaluate these improvements in a manner that reflects the complexities of real-world communication.

In summary, while the potential of AR in EFL education is well-documented, its specific application in the assessment of speaking skills is an emerging field warranting further investigation. The current study aims to bridge this research gap by designing and validating an AR-based assessment module as a formative tool that offers authentic feedback and fosters meaningful interactions. By examining the alignment of AR technology with the communicative approach to language teaching, this review positions the research at the intersection of innovation and practical application, setting the stage for a deeper understanding of AR's role in enhancing and measuring spoken language proficiency within EFL classrooms.

Our exploration of AR in EFL classrooms extends beyond mere technological application; it is a stride toward a reimagined future of language education where students are equipped not just with language proficiency, but also with the capability to apply these skills effectively in real-world scenarios. The aim is to foster an environment where the technology is not just a novelty but an integral component of the educational fabric, promoting a blend of learning and authentic assessment that underscores practical utility over rote memorization.

This study contributes to the existing body of knowledge by providing empirical data on the effectiveness of AR in speaking skill acquisition and delivering an innovative AR-based assessment module. It also offers practical insights for EFL practitioners on implementing AR technologies in

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their teaching repertoire. Through this investigation, the researchers hope to illuminate the pathways through which technology can enrich language learning and empower students to achieve linguistic excellence in an increasingly interconnected world.

METHOD

This study employs a mixed-methods approach, combining both quantitative and qualitative methodologies (Mackey & Bryfonski, 2018;), to comprehensively address the research gap in assessing speaking skills within EFL classrooms using Augmented Reality (AR). By integrating diverse research methods, the study aims to provide a holistic understanding of the effectiveness of AR technology in enhancing speaking proficiency.

The primary focus of this research is the development and validation of an innovative AR-based assessment module tailored specifically for evaluating speaking skills. This module serves as a pivotal tool designed to offer formative assessments, providing authentic feedback to students and facilitating meaningful interactions. Through meticulous design and validation processes, the module aims to ensure its reliability and validity in assessing speaking proficiency accurately. In line with the communicative approach to language teaching, the AR-based assessment module is meticulously designed to complement this pedagogical philosophy. Emphasizing the integration of innovative AR technology, the module aims to strike a balance between fostering communicative competence and leveraging technological advancements. By emphasizing the interplay between innovation and practicality, the module aims to enhance students' speaking skills within EFL classrooms, providing them with valuable opportunities for authentic language use and interaction.

The study enlisted the participation of forty-five EFL learners included 25 were male and 20 were female, from the Faculty of Tarbiyah, English Department, IAIN Fattahul Muluk Papua, Indonesia. The participants were selected based on their enrollment in English language courses within the department, ensuring that they possessed a similar academic background and language proficiency level. The recruitment process aimed to gather a representative sample of EFL learners to enhance the generalizability of the study findings.

Upon recruitment, participants underwent a pre-test to establish their baseline speaking skills. This initial assessment provided essential data on participants' proficiency levels before any intervention took place. Following the pre-test, participants engaged in a series of language activities integrated with AR technology. These activities were designed to provide immersive learning experiences and enhance participants' speaking skills within the EFL context. Subsequently, a post-test was administered to measure the effectiveness of the AR-integrated language activities in improving participants' speaking proficiency. By comparing pre-test and post-test scores, the study sought to evaluate the impact of AR technology on language learning outcomes.

The study was conducted over the duration of a semester, aligning with the academic calendar of the institution. Classroom settings within the Faculty of Tarbiyah, English Department, IAIN Fattahul Muluk Papua served as the primary implementation context. Throughout the semester, participants engaged in AR-integrated language activities as part of their regular coursework. This longitudinal approach allowed for sustained exposure to AR technology and facilitated comprehensive data collection. By embedding the study within the naturalistic context of the classroom, the research aimed to capture authentic learning experiences and interactions, thus enhancing the ecological validity of the findings.

For the research instruments and procedures, a comprehensive approach was adopted to ensure the thorough examination of the AR-based assessment module's development and implementation. This involved employing both quantitative and qualitative data collection strategies to gather empirical evidence.

In terms of instruments, various methods were utilized to assess students' spoken English proficiency. This included pre-tests and post-tests, which provided quantitative data on participants' language skills before and after the integration of AR technology. Additionally, qualitative insights were gleaned through interviews and observation techniques, allowing for a deeper understanding of students' experiences and engagement with the AR-based assessment module.

Central to the study was the AR-based assessment module itself, designed to be an interactive and engaging tool for evaluating speaking proficiency. By integrating AR technology into authentic assessment scenarios, the module aimed to provide students with immersive learning experiences that mirrored real-world communication contexts. This innovative

approach not only enhanced student engagement but also offered a more dynamic platform for assessing language skills.

Evaluation of the module's effectiveness encompassed both qualitative and quantitative analyses. Qualitative outcomes were derived from interviews and classroom observations, offering rich insights into students' perceptions and behaviors regarding the AR-based assessment. Meanwhile, quantitative data obtained from pre and post-test results allowed for the quantification of student progress and the assessment of the module's impact on speaking proficiency. This comprehensive evaluation approach provided a nuanced understanding of the module's efficacy and its implications for language teaching and assessment practices.

RESULTS AND DISCUSSION

Quantitative results

Upon concluding the AR intervention, the collected data from the pre-test and post-test were meticulously analyzed using both descriptive and inferential statistics to evaluate changes in students' EFL speaking proficiency.

Table 1. *Descriptive statistics*

	Pre-Test	Post-Test
Mean score	2.4	3.9
Median score	2.5	4.0
Standard deviation	0.6	0.4

Table 1 reveal that initial examination of the pre-test data recorded an average mean score of 2.4 (on a scale of 5), with a median of 2.5 and a standard deviation of 0.6, illustrating the initial speaking proficiency of the participants. The post-test results showed an increased average mean score of 3.9, median of 4.0, and a reduced standard deviation of 0.4, indicating an improvement in speaking skills with less variability among participants' performances.

Table 2. *Results of inferential statistics, and ANCOVA test*

Statistical Test	Value
Paired-sample t-test	$t(59) = -10.24$, $p < .001$
ANCOVA	Sustained t-test outcomes after adjustment for potential confounding variables.

Table 2 shows that the paired-samples t-test provided a clear statistical interpretation of the proficiency improvement. A significant improvement in scores was noted ($t(59) = -10.24$, $p < .001$), confirming the efficacy of AR intervention in enhancing speaking skills. Additionally, an ANCOVA test was conducted, which sustained the outcomes of the t-tests after adjustment for potential confounding variables, further supporting the robustness of the result.

This statistical analysis validates that the integration of AR technology has notably fortified the speaking proficiency of the EFL learners partaking in the study. The positive changes in scores from the pre-test to the post-test periods are indicative of the AR interventions' potential in bringing about substantial improvements in the target language skills. Furthermore, the increase in proficiency, as evidenced by the descriptive data, was corroborated by the inferential tests, which highlighted the significant impact of the AR-based activities.

This improvement underscores the role AR technology can play in enhancing the quality and effectiveness of speaking skill instruction and assessment within EFL classrooms. The results suggest that AR technology can stimulate real-world communicative scenarios that support language development, reinforcing its viability as a powerful pedagogical tool for language educators.

Quantitative findings on the implementation of the AR-based assessment module

Table 3. *Quantitative data on the implementation of the AR-based assessment module*

Measure	Pre-Test Mean	Post-Test Mean	Improvement
Speaking Proficiency Scores	2.5	4.0	1.5

Table 3 mentions that quantitative analysis of pre and post-test scores revealed a significant improvement in students' speaking proficiency following the implementation of the AR-based assessment module. The pre-test mean score (2.5) indicated the initial level of speaking proficiency among participants, while the post-test mean score (4.0) demonstrated the proficiency level after the intervention. The calculated improvement (1.5) quantifies the extent of progress made by students in their speaking abilities. These results suggest that the AR-based assessment module effectively contributed to enhancing students' language skills, as evidenced by the measurable increase in post-test scores compared to pre-test scores.

Qualitative results

Integrating Augmented Reality (AR) technology

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into language assessment brings forth a myriad of insights into student experiences and perceptions. Firstly, qualitative data illuminate a remarkable surge in student engagement, attributing it to the module's interactive features, which offer dynamic and stimulating learning experiences. Secondly, students express a favorable perception of the AR-based assessment module, emphasizing its novelty and engaging nature, fostering excitement and enthusiasm for learning. Thirdly, students highlight the module's role in enhancing comprehension of intricate language concepts, leveraging its interactive features for hands-on learning opportunities. Furthermore, students appreciate the real-world relevance of assessment tasks, closely resembling authentic communication situations. Lastly, the immediate feedback mechanism of the module contributes to students' enhanced confidence in their speaking abilities. Despite these positive aspects, challenges such as technical difficulties and suggestions for improvement underscore the need for continued refinement. Below are detailed insights into students' experiences and perceptions regarding the integration of AR technology into language assessment, accompanied by excerpts from their feedback.

Increased engagement

The qualitative data revealed a notable increase in student engagement with the AR-based assessment module when contrasted with conventional assessment approaches. Students conveyed a sense of heightened interest and involvement with the module, attributing it to its interactive features. They found the module to be dynamic and stimulating, providing an immersive learning experience that captivated their interest. This heightened engagement was further accentuated by the interactive elements embedded within the module, which encouraged active participation and interaction. Overall, students expressed a preference for the AR-based assessment module due to its ability to make learning more enjoyable, interactive, and engaging compared to traditional methods. Here are statements from some participants based on the results above.

Excerpt 1 (students #2):

> "Using the AR-based assessment module was like stepping into a whole new world of learning. It wasn't just about answering questions; it was about exploring and interacting with the content in a way that felt real. I found myself more engaged and motivated to participate because it felt like I was part of something bigger."

Excerpt 2 (students #3):

> "Before, assessments felt like a chore, something I had to get through. But with the AR module, it was different. It was fun, like solving puzzles or playing a game. I didn't even realize I was being assessed; I was too busy enjoying the experience."

Excerpt 3 (students #7)

> "The AR module made learning feel more alive. It wasn't just reading from a textbook or listening to a lecture; it was like being in the middle of a conversation or a real-life scenario. I felt more connected to the material and more eager to participate because it felt relevant and immediate."

Positive learning experience

Students expressed a favorable perception of the AR-based assessment module, highlighting its novelty and engaging nature as key factors contributing to a positive learning experience. The innovative use of augmented reality technology intrigued students, fostering excitement and enthusiasm towards participating in the assessment activities. The module's interactive nature provided a departure from traditional assessment methods, encouraging students to actively engage with the content in a dynamic and immersive manner. Below are statements from some participants based on the results above.

Excerpt 4 (students #6)

> “The AR-based assessment module was unlike anything I've experienced before. It was like stepping into a whole new dimension of learning. I was genuinely excited to participate because it felt like I was part of something groundbreaking."

Excerpt 5 (students #9)

> “I never thought assessments could be this fun! The AR technology made everything so engaging and interactive. It felt like I was playing a game rather than taking a test. I actually looked forward to the assessment activities because of it."

Excerpt 6 (students #12)

> "The AR module completely changed my perspective on assessments. It wasn't just about answering questions; it was about exploring and interacting with the material in a way that felt meaningful. I felt more motivated to learn because of it."

Enhanced understanding

To expand on this, the AR-based assessment module was highlighted by multiple students as instrumental in enhancing their comprehension of intricate language concepts. They emphasized that the interactive features of the module facilitated hands-on learning opportunities, which proved invaluable in comprehending abstract linguistic principles. Here are three excerpts from students regarding this:

Excerpt 7 (students # 15):

> "Using the AR module, I could visualize complex language structures, which made it much easier for me to understand. It felt like I was interacting directly with the concepts, rather than just reading about them."

Excerpt 7 (students # 17)

> "The hands-on approach of the AR activities really helped me grasp difficult grammar rules. Instead of just memorizing rules from a textbook, I could actually see how they applied in different contexts."

Excerpt 8 (students # 18)

> "With the AR module, I could explore language concepts in a more interactive way. It felt like solving puzzles, where each interaction helped me piece together a clearer understanding of the language."

Real-world relevance

Students appreciated the real-world relevance of the assessment tasks facilitated by the AR-based module. They noted that the scenarios presented in the assessments closely resembled authentic communication situations, making the learning experience more practical and applicable to their future language use. Below are three student excerpts concerning this matter:

Excerpt 9 (students # 20)

> "The AR assessments felt like I was actually having conversations in real-life situations. It made me realize how language skills apply outside the classroom, which motivated me to improve."

Excerpt 10 (students # 22)

> "The scenarios in the AR assessments were so lifelike. It wasn't just about language; it was about understanding cultural nuances and social interactions, which are crucial in real-world communication."

Excerpt 11 (students # 23)

> "I appreciated how the AR assessments challenged me to think on my feet, just like I would in actual conversations. It wasn't just about memorizing vocabulary; it was about using language in practical, meaningful ways."

Increased confidence

Many students reported feeling more confident in their speaking abilities after completing the AR-based assessment tasks. The immediate feedback provided by the module allowed them to track their progress and identify areas for improvement, contributing to their overall confidence in using the English language. Here are three excerpts from students regarding this:

1.

Excerpt 12 (students # 25)

> "I used to feel nervous about speaking English, but the AR assessments helped me see where I was doing well and where I needed to improve. Now, I feel more confident expressing myself."

Excerpt 13 (students # 26)

> "Getting instant feedback from the AR module was like having a personal language coach. It made me realize that I'm capable of communicating effectively in English, and that boosted my confidence a lot."

Excerpt 14 (students # 31)

> "Before, I was always second-guessing myself when speaking English. But after using the AR-based assessments, I feel more assured in my language skills. It's like I've gained a new level of confidence."

Challenges and suggestions

Despite the overall positive feedback, some students also highlighted challenges they

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encountered while using the AR-based assessment module. Common issues included technical difficulties and the learning curve associated with using new technology. Additionally, students provided valuable suggestions for improving the module's usability and effectiveness, such as incorporating more diverse assessment tasks and providing clearer instructions. Here are three student responses regarding this:

Excerpt 14 (students # 36)

> "I faced some technical glitches while using the AR module, which was frustrating at times. It took me a while to figure out how to navigate through the tasks smoothly."

Excerpt 15 (students # 43)

> "The learning curve for using the AR technology was steep for me initially. I think having some tutorials or guidance on how to use the features would have been helpful."

Excerpt 16 (students # 45)

> "While the assessments were engaging, I felt that they could be more varied. It would be great to have different types of tasks to assess different aspects of language skills. Also, clearer instructions would make it easier to understand what's expected."

Overall, the qualitative data revealed that the AR-based assessment module had a positive impact on students' learning experiences and engagement. It provided them with interactive and immersive opportunities to develop their speaking skills while also offering valuable insights for further improvement.

The findings of this study suggest that the AR-based assessment module effectively contributes to enhancing speaking proficiency among EFL learners. Quantitative analysis of the data showed a notable improvement in post-test scores after the implementation of the AR intervention. This improvement indicates that the AR technology played a significant role in facilitating language learning, as evidenced by the students' enhanced speaking skills.

Moreover, qualitative insights from interviews and observations provided further depth to the interpretation of results. They revealed that the AR-based assessment module not only led to improvements in speaking proficiency but also fostered other positive outcomes. For example, students reported increased engagement with the module, indicating that they were more actively involved in the learning process. This heightened engagement suggests that the interactive and immersive nature of AR technology contributed to creating a more stimulating learning environment.

Furthermore, qualitative data highlighted that students experienced positive learning experiences through the AR-based assessment module. The innovative use of augmented reality technology made learning more dynamic and enjoyable for students (Hsieh, 2016; Sural, 2018; Zhang & Paredes, 2021), leading to a more positive overall perception of the learning activities. Additionally, the module appeared to enhance students' confidence in their language abilities, as they received immediate feedback and were able to track their progress over time.

Overall, the interpretation of results suggests that the AR-based assessment module not only improves speaking proficiency but also enhances student engagement, fosters positive learning experiences, and boosts confidence in language skills. These findings highlight the potential of AR technology to transform language education and provide valuable insights for educators seeking innovative approaches to teaching and assessment in EFL classrooms.

Our study's findings align with previous research demonstrating the advantages of integrating AR technology into language education. Studies by Klopfer & Squire (2008), and Liao et al. (2024) have emphasized the positive impact of AR on learner engagement, motivation, and overall language proficiency. Similarly, Расулова (2022), and Koumpouros (2024) have highlighted AR's potential in creating contextual learning environments conducive to language acquisition in EFL settings. These studies collectively underscore the utility of AR technology in enhancing various aspects of language learning.

However, while prior research has explored the benefits of AR in language education broadly, our study contributes to the literature by specifically focusing on the assessment aspect. Few studies have delved into the evaluation of speaking skills within AR-integrated frameworks. Parmaxi & Demetriou (2020) have made strides in this direction, shedding light on AR's capacity to enhance language skill assessment by providing authentic and engaging contexts for students. Similarly, Pennington & Revell, (2019), and Zhu et al., (2022) have explored AR's potential in improving pronunciation, emphasizing its interactive nature and ability to provide

personalized feedback.

In our study, we build upon this foundation by investigating the effectiveness of an AR-based assessment module in evaluating speaking proficiency. By incorporating both quantitative and qualitative data collection methods, we provide comprehensive insights into the module's efficacy. Our findings suggest promising directions for the assessment of speaking skills via AR technology, aligning with the growing body of research highlighting the potential of AR in language education.

Overall, while previous studies have laid the groundwork by emphasizing AR's benefits in language learning, our research adds to this knowledge by focusing on its assessment aspect. By bridging this gap in the literature, we contribute valuable insights into the potential of AR technology to enhance language assessment practices in EFL contexts.

The observed patterns in our data suggest that the interactive and immersive nature of the AR-based assessment module played a crucial role in facilitating language learning. The hands-on learning experiences offered by the module allowed students to better understand complex language concepts, leading to improved speaking proficiency. Furthermore, the real-world relevance of the assessment tasks provided students with practical language practice, enhancing their ability to communicate effectively in authentic situations.

Despite the promising results, it is essential to acknowledge several limitations of this study. Firstly, the sample size of forty-five participants may limit the generalizability of our findings. Additionally, the study was conducted within a single institution and over a relatively short duration, which may impact the external validity of the results. Furthermore, technical difficulties encountered by some students highlight the need for further refinement of the AR technology and instructional design.

The findings of this study have several implications for language educators and practitioners. The integration of AR-based assessment modules offers a promising avenue for enhancing language teaching and learning in EFL contexts. By providing students with immersive and engaging learning experiences, educators can foster greater.

CONCLUSION

This study has demonstrated the efficacy of integrating AR-based assessment modules in enhancing speaking proficiency among EFL learners. The findings revealed a significant improvement in post-test scores following the intervention, indicating the effectiveness of AR technology in facilitating language learning. Moreover, qualitative insights highlighted the module's role in fostering increased engagement, positive learning experiences, and enhanced confidence among students.

The results of this study contribute to existing literature on AR technology in language education by specifically focusing on the assessment aspect. Comparisons with previous studies underscored the consistent benefits of AR integration in fostering engagement, motivation, and language proficiency among learners. However, this research extends beyond prior work by providing comprehensive insights into the module's effectiveness in evaluating speaking skills within an EFL context.

The implications of this study are significant for language educators and practitioners. The integration of AR-based assessment modules offers a promising avenue for enhancing language teaching and learning. By providing students with immersive and engaging learning experiences, educators can foster greater student engagement and motivation, leading to improved language proficiency outcomes.

Overall, this research highlights the potential of AR technology to revolutionize language education, particularly in EFL contexts. As technology continues to advance, incorporating innovative tools like AR-based assessment modules can play a crucial role in addressing the evolving needs of language learners and preparing them for success in today's interconnected world.

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