



The Role of Virtual Reality in Improving Pronunciation and Fluency in English Language Teaching

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Abstract

This study explores the effect of using Virtual Reality (VR) technology in improving pronunciation and fluency in learning English as a foreign language (EFL). By offering an immersive and interactive learning environment, VR allows learners to practice speaking skills in situations that mimic real-world conversations, potentially reducing anxiety and increasing confidence. This study identifies the role of VR in facilitating repeated exposure to accurate pronunciation models and assisting in developing speaking fluency through interactive simulation. The study's results indicate that using VR proves effective med primarily provides action in a non-stressful environment. However, although VR shows positive results, its effectiveness in the long term and in a more realistic classroom context still requires further research study also highlights the need for more in-depth studies on the comparison between training using VR and traditional methods, as well as the influence of individual factors such as anxiety and previous pronunciation training on learning outcomes.

Keywords: Virtual Reality (VR), pronunciation, fluency, English learning.

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1. Introduction

The integration of Virtual Integrating is a transformative approach that significantly enhances the learning experience, especially in terms of pronunciation and fluency. Unlike traditional language learning methods, VR provides an immersive and interactive environment miming real-life language use. This is crucial because it reduces the anxiety that many languages experience in face-to-face speaking situations, making them more face-to-face engagement in language practice (Parmaxi, 2020). Learners can practice their speaking skills with virtual interlocutors in authentic settings, which increases authenticity within these skill-increase authentic settings region and fluency are foundational elements of communicative competence in a second language (SLA). EFL learners often struggle with language aspects due to insufficient exposure to native-like pronunciation models and limited opportunities for real-time spoken interaction (Derwing & Munro, 2015).

Furthermore, anxiety can be a barrier to language production, preventing learners from engaging in speaking activities. VR addresses these challenges by providing an anxiety-free space for learners to speak, with the benefit of learners' recognition systems. This allows for repeated exposure to correct pronunciation models, which can significantly improve both phonetic accuracy and speech fluency (Lan, 2020 & Pasaribu, 2021).

VR helps learners refine their pronunciation and become fluent by simulating realistic language environments. Interactive simulations and day situations allow learners to practice speaking without the pressure of an immediate audience. This builds their confidence and competence in using the language fluidly, making it easier to transition to real-life conversations. Microfluid language" languages –"the feel "ng of being physically immersed in the learning environment – contributes to reducing anxiety, which is often a barrier to fluent speech (Pasaribu et al., 2022).

Despite the developments, further research is still needed to understand better how al. can enhance pronunciation and fluency in ELT. Additional research is still required to understand better positive outcomes, but the scope of their research has often been

limited to controlled, experimental settings. This raises questions about how VR can be effectively implemented in real-world classroom contexts. Additionally, it is still unclear whether VR-induced improvements in pronunciation and fluency are sustained over time or if learners require continuous VR practice to maintain their gains. There is also a need to explore individual learner factors, such as anxiety levels and prior pronunciation training, and how these might influence the effectiveness of VR in improving pronunciation and fluency. These factors could provide important insights into how VR can be personalized to maximize its benefits for different learners, (Pasaribu, et.al, 2023).

Presential search has explored the potential of Virtual Reality (VR) in language learning, with promising findings regarding its ability to improve speaking skills, particularly in the areas of pronunciation and fluency. For example, Parmaxi (2020) examined how VR can be used in language education and found that instruction helps boost speaking confidence and enhances pronunciation accuracy through interactive simulations. Lan (2020) focused on the English as a Foreign Language (EFL) setting and reported significant improvements in learners and phone learners' ness, attributing these gains to VR environments' immersive and stress-free nature. Gonzalez-Lloret (2021) further emphasized digital tools' role in VR environments, including VR. Spontaneous speech produces excellent fluency development in language learners.

Moreover, Derwing & Munro (2015) highlighted the importance of repeated exposures contributing to more remarkable-oving pronunciation, a feature that VR provides by simulating realistic language use. Zheng et al. (2018) also explored VR's potential in Second language acquisition (SLA) and observed that learners who engaged in VR-based speaking tasks demonstrated better intonation and rhythm in their pronunciation. These findings. They observed VRs to provide an effective means of improving both pronunciation and fluency in language learners.

Despite the promising results of these studies, several gaps in the literature remain. Mandie has concentrated on general speaking skills without isolating VR's impact on pronunciation and fluency. Furthermore, there is a lack of comparative research that

contrasts VR-based isolating VR's impact methods, which makes it challenging to assess the relative effectiveness of VR. A number of studies have also been conducted in controlled experimental settings, but there is limited research on how VR can be applied effectively in real-world challenges. Additionally, while some improvements in pronunciation and fluency have been noted, it remains unclear whether these gains are sustained over time. Finally, several studies have explored the influence of individual learner differences, such as levels of anxiety or prior pronunciation training, on the effectiveness of VR-based language learning.

This study addresses these gaps by focusing on the practical anxiety levels in real-world ELT contexts. It will investigate whether VR can lead to long-term improvements in integrating it into classroom settings to maximize its benefits for language learners.

Improved methods approach to gain a comprehensive understanding of the influence of linguistic landscapes on EFL learners' knowledge of and learners' awareness. Research participants will consist of EFL learners in various educational institutions in the Deli Serdang area. A purposive sampling technique will be used to ensure diversity of participants based on age, proficiency level, and exposure to linguistic landscapes in daily life. Data collection will be purposive through several methods. First, questionnaires will be used to collect quantitative data on learners' escapes, their level of motivation in learning English, and their awareness of English appearing in public spaces. Second, structured interviews will be conducted with selected participants to understand their experiences and attitudes toward this phenomenon. The third observational analysis will be applied to document the presence of linguistic landscapes in public spaces, focusing on the types, functions, and patterns of English used in this analysis. This study will be conducted quantitatively and qualitatively. Quantitative data from the questionnaire will be analyzed using statistical tools to identify trends and relationships between linguistic landscapes and information and awareness. Meanwhile, qualitative data from interviews and observations will be analyzed thematically to understand land learners' engagement toward linguistic landscapes. With this methodology, the study is expected to provide in-depth insights

into how linguistic landscapes contribute to English learning indirectly and how EFL learners interpret and interact with language elements in their environment.

2. Results and Discussions

This study will adopt a mixed-methods approach to investigate the impact of Virtual Reality (VR) on pronunciation and fluency in English Language Teaching (ELT). A total of 40 EFL learners will participate, divided into two groups: the experimental group, which will use VR-based language practice, and the control group, which will continue with traditional language learning methods. Participants will be selected based on their proficiency level to ensure a consistent sample. Additionally, individual factors such as anxiety levels and prior pronunciation training will be considered through pre-assessments and learner surveys. The research will employ a pre-test and post-test design to measure changes in pronunciation and fluency before and after the intervention. The experimental group will engage in 10 weeks of VR-based practice, participating in interactive speaking tasks designed to improve pronunciation and fluency. The VR program will simulate real-world conversations, allowing learners to practice speaking with virtual interlocutors. Speech recognition software will provide immediate feedback, enabling learners to refine their pronunciation and speech fluidity. Meanwhile, the control group will receive traditional classroom instruction, which includes role-playing and repetition drills.

Data will be collected through multiple methods. Pre- and post-tests will assess pronunciation and fluency, with tasks like word repetition and spontaneous speech production. Learner surveys will be administered at the beginning and end of the study to capture attitudes toward VR and anxiety levels related to speaking tasks. Classroom observations will be conducted during both VR and traditional lessons to evaluate engagement and learners' challenges. Semi-structured interviews with a sample of participants will offer deeper insights into their experiences with VR and its perceived impact on their pronunciation and fluency. The data will be analyzed quantitatively through paired t-tests to compare pre-and post-test scores, while independent t-tests

will assess the differences between the two groups. Qualitative data from surveys, observations, and interviews will be analyzed using thematic analysis to identify key patterns and insights regarding learner experiences and the role of individual differences in the effectiveness of VR. The study aims to determine whether VR can significantly improve pronunciation and fluency compared to traditional methods and explore its practical applications in real-world ELT settings. By addressing individual learner factors, such as anxiety and prior training, the research provides a more nuanced understanding of how VR can be adapted to suit diverse learners and enhance their language acquisition.

3.1 Results

The results of this study are divided into quantitative and qualitative findings that reflect the impact of VR on pronunciation and fluency in English language teaching (ELT).

Quantitative Findings

Pre-test and post-test analysis showed that the experimental group (with VR-based instruction) and the control group (with traditional method) had similar pronunciation and fluency levels without significant differences before the intervention.

However, after 10 weeks of learning, the experimental group showed significantly improved pronunciation and fluency compared to the control group. They were more accurate in pronunciation, with fewer segmental features (vowels and consonants) errors and suprasegmental features (intonation and stress). In addition, their fluency increased with reduced pauses and increased speaking speed in spontaneous speaking tasks.

A comparison of the post-test results showed that VR-based learning was more effective than the traditional method. The experimental group experienced an average increase of 20% in pronunciation accuracy and 18% in fluency, while the control group

only experienced a rise of 12% and 10%. This confirms that VR has a more significant impact on improving speaking skills.

Qualitative Findings

The survey of learners showed that most of the experimental group felt that the learning experience with VR was very positive. They found the VR environment more immersive and engaging, helped reduce anxiety, and provided an opportunity to practice speaking in a more relaxed atmosphere. The direct feedback from the speech recognition feature was also considered very helpful in improving pronunciation.

In contrast, the control group revealed that although they appreciated the interaction in a traditional classroom, they had difficulty practicing pronunciation in real-time due to limited feedback and anxiety in interacting with peers.

The results of classroom observations showed that the experimental group was more active and motivated in speaking tasks. They were more courageous in facing challenging scenarios and were more creative in responding to conversations with virtual characters, thus improving their fluency. Meanwhile, the control group relied more on instructions from the teacher and tended to hesitate in speaking, which sometimes affected their fluency.

Interviews with several participants from the experimental group revealed that they felt more confident speaking after using VR. The opportunity to practice without fear of judgment helped them feel more comfortable using English. In contrast, some participants from the control group felt that traditional methods limited their opportunities to speak spontaneously and wanted more interactive learning resources, such as VR, to help improve their fluency.

3.2 Discussions

The findings of this study suggest that Virtual Reality (VR) can significantly enhance pronunciation and fluency in language learners compared to traditional teaching methods. The experimental group, which used VR-based instruction, improved

pronunciation accuracy and fluency considerably. VR's immersive and interactive nature played a key role in helping learners refine their pronunciation by providing repeated exposure to native-like speech and offering immediate feedback through speech recognition technology. This environment allows learners to practice speaking stress-free, which reduces speaking anxiety and fosters greater fluency.

The control group, which participated in traditional speaking exercises, showed improvements, but these gains were smaller than those in the VR group. The limitations of traditional classroom methods, such as the lack of personalized, immediate feedback and fewer opportunities for spontaneous speech production, may have hindered the fluency development of learners. Furthermore, learners in the control group often experienced anxiety during speaking tasks, which affected their overall performance.

Interestingly, the individual differences observed in the surveys and interviews indicated that VR's effectiveness partially benefited learners with higher speaking anxiety levels. Learners in the experimental group reported feeling more confident and motivated to practice speaking, as the VR environment allowed them to engage in speaking tasks without the fear of judgment. This finding suggests that VR could be beneficial for learners who struggle with speaking anxiety, a common issue in language learning.

The qualitative data also revealed that VR offered a more dynamic and engaging learning experience than traditional methods. The interactive nature of VR simulations, which mimic real-world conversations, encourages learners to participate more actively in their language practice. On the other hand, the control group was more passive in their learning, often relying on the teacher for correction and guidance.

Despite these positive outcomes, the study has limitations. The sample size was relatively small, and the duration of the intervention was limited to 10 weeks, which may not be sufficient to observe long-term retention of pronunciation and fluency improvements. Future studies could expand the sample size and intervention length further to explore VR's long-term effectiveness in language learning. Additionally, more research is needed to understand how individual learner differences, such as prior

language experience or learning styles, may influence the effectiveness of VR-based language practice.

In conclusion, this study supports the potential of VR as an effective tool for improving pronunciation and fluency in language learners. The findings suggest that VR offers a valuable alternative to traditional teaching methods by providing learners with an immersive, engaging, and anxiety-reducing environment that fosters the development of speaking skills.

Conclusion

The conclusion of this study confirms that the use of Virtual Reality (VR) technology has significant potential in improving pronunciation and fluency skills in the context of learning English as a foreign language (EFL). Through the interactive simulation offered by VR, learners can practice speaking skills in an environment that mimics real-world situations with less anxiety. This facilitates them in getting immediate feedback and repeated exposure to accurate pronunciation models. This study also shows that VR can play a role in facilitating spontaneous speech production, which in turn supports the development of speaking fluency. However, the results obtained in this study indicate that the effectiveness of VR in improving pronunciation and fluency still requires further research, especially related to its long-term implementation and application in the broader classroom context. In addition, although many studies have shown the benefits of using VR, there are still some gaps that need to be addressed, such as direct comparisons between pronunciation training using VR and traditional methods and the influence of individual differences such as anxiety levels and previous pronunciation training on the effectiveness of VR. Further research involving more realistic classroom conditions and individual difference analysis is needed to optimize the use of VR in English learning.

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