From virtual to reality: Assessing the transferability of language skills acquired through VR

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Virtual reality (VR) has emerged as a powerful tool in language education, offering immersive environments that simulate real-life communication scenarios. Unlike traditional classroom methods, VR allows learners to interact with target language speakers, navigate culturally rich settings, and respond to authentic language cues—all within a controlled, engaging space. While the technology shows promise for enhancing vocabulary, pronunciation, and conversational fluency, a key question remains: Do the skills developed in virtual settings translate effectively to real-world communication?

In this article, I explore the impact of VR-based language learning beyond the digital experience. It examines how learners apply VR-acquired language skills in everyday situations, considering factors such as confidence, accuracy, and cultural competence. By analyzing recent studies and learner experiences, this research aims to assess the practicality and long-term value of VR as a language learning tool, particularly in bridging the gap between virtual fluency and real-world proficiency.

Understanding virtual reality in language education

Virtual reality (VR) can be defined as a fully immersive, 360-degree learning experience that goes beyond traditional educational settings, involving learners in a digitally-enriched, multisensory environment, providing a unique and effective learning approach (Parmaxi, 2020). According to Lloyd et al. (2017), VR is "an immersive computer-enabled technology that replicates an environment and allows a simulation of the user to be present and interact in that environment" (p. 222). Wang and Braman (2009) also supported the same notion in their study claiming that the highly immersive virtual environment provides students with a sense of reality, enabling them to actively explore and comprehend content, rather than passively sitting through a traditional lecture in a classroom setting.

Pinho et.al. (2009) stated that VR has three key characteristics: immersion, interaction, and involvement. Sherman and Craig (2003) describe four key elements of the VR experience, such as a virtual world, immersion, sensory feedback (responding to user input), and interactivity. According to them "a virtual world is the content of a given medium. It may exist solely in the mind of its originator or be broadcast in such a way that it can be shared with others" (p. 6). They also identified two types of immersion in virtual reality: physical immersion and mental immersion. Physical immersion involves the user's ability to interpret sensory cues such as visual, auditory, and haptic feedback to navigate and control objects in a virtual environment. On the other hand, mental immersion refers to the state of being deeply engaged within a VR environment. In terms of sensory feedback VR empowers users to choose their perspective by physically positioning themselves and to influence occurrences within the virtual environment.

After considering all these features of VR, Hua and Wang (2023) explain that VR has immense potential to be integrated in language teaching and learning to promote contextualized and interactive learning experiences. VR technology can be an effective tool for language education, particularly in foreign language learning because it enables students to practice their language skills in realistic situations, making language learning more engaging and enjoyable. Besides this, VR could promote "intrinsic motivation, more intercultural awareness, and a reduction of the affective filter" (Schwinhorst, 2002, p. 230).

Transferability of language skills acquired through VR

In order to assess the transferability of the language skills acquired through VR, it is essential to know what different researchers say about VR use in their findings. One of the most important language skills learned through VR is vocabulary. Alfadil (2020) conducted research to explore the influence of the VR game *House of Languages* on English as a Foreign Language (EFL) vocabulary acquisition of intermediate school students. In this study, he reported that students who used VR games had shown greater performance in vocabulary acquisition than those who learned vocabulary through traditional learning. A similar study in Taiwan with 49 grade seven students also found that learning vocabulary through virtual reality (VR) was significantly more effective than traditional video watching. The VR group had higher vocabulary learning and retention due to contextualized learning through virtual environments with multimodal support, real-time interactivity, and feedback (Tai et al., 2022).

VR supports not just vocabulary development but also plays an important role in improving writing skills, which are often the most challenging in language learning. Several studies highlight VR as an effective way to enhance writing abilities. Chen et al. (2022) examined the use of spherical video-based virtual reality (SVVR) to support Chinese composition writing and provide authentic contexts for students. The experiment involved 59 grade four students divided into experimental and control groups. Results demonstrated that

the SVVR-supported learning approach improved students' behavioral engagement and deep writing skills, leading to better linguistic expressiveness and creative thinking performance than the non-SVVR approach. In line with these findings, Feng (2023) discussed that learners using immersive virtual reality (IVR) performed significantly better on target language word usage, lexical density, distribution richness, and completion of tasks than those in the conventional classroom in an EFL context. Ebadijalal and Yousofi (2022) also noticed similar improvements in their participants' writing regarding task achievement, lexical resource, grammatical range and accuracy, and overall writing performance while experimenting with Google Expedition (GE) in the Iranian EFL context.

Most of the research related to VR in ESL/EFL focuses on measuring the effectiveness of VR in improving oral proficiency or speaking skills. Chien (2020) observed that learners' English speaking, learning motivation, and critical thinking skills improved after implementing a peer-assessment-based SVVR approach for a high school English course in China. Besides SVVR, the Google Expeditions VR platform has also been found to be an authentic VR platform to improve the oral proficiency of EFL learners (Ebadi & Ebadijalal, 2022). VR tools also helped the learners improve their vocabulary, content, and presentation skills in the target language (Damio & Ibrahim, 2019; Xie et al., 2021). Finally, it can be said that in terms of speaking a second language, virtual reality has been reported as one of the most promising platforms, with no significant negative outcomes reported.

Although listening and speaking are mostly intertwined, only some studies are found based on the immersive VR experiment on EFL/ESL learners' listening comprehension. Tai (2022) found that Taiwanese seventh graders using VR felt more engaged and motivated in listening tasks with realistic, interactive scenarios. Similarly, Tai et al. (2020) showed that grade seven students using mobile VR headsets for the Mondly app had higher listening comprehension and memory than those watching videos, feeling more immersed, focused, and less anxious.

Alemi and Khatoony (2020) found that 18 young Iranian EFL learners significantly improved their English pronunciation after undergoing ten sessions of VR-assisted training that lasted 90 minutes each. The training was designed as a VR game facilitated by a humanoid robot and targeted aspects of English pronunciation like contrasting vowels (such as /ɪ/ and /i/).

Reading through virtual reality is found more appealing and exciting among learners. Pianzola et.al. (2019) reported that the use of VR in reading can increase the desire to read by immersing the reader in the story world and creating an emotional connection and affective empathy. Their findings suggest that VR can be a valuable tool for encouraging reading. Their study mainly focused on whether reading a chapter of a fictional story in virtual reality (VR) can make the reading experience more appealing and increase the

intention to read the story further or not. However, for efficient reading, it is necessary to understand how a text should be displayed in VR. Rau et al. (2018) claimed that VR requires more time for the students to speed up reading and make choices compared to desktop display.

Although not directly connected to skills transferability, besides cognitive benefits VR has also shown significant affective benefits such as promoted task engagement, enhanced motivation, elicited positive attitudes and emotions, promoted willingness to communicate, promoted confidence, reduced foreign language anxiety, and reduced psychological distance between students and teachers (Hua & Wang, 2023).

The challenges and limitations facing virtual reality in real-world applications

Additionally, unfamiliarity with VR technology may pose technical challenges for teachers and learners during learning. Lesson planners or designers may produce inauthentic materials if they are not familiar with the pedagogical implications of VR (Lee & Park, 2020). Moreover, higher costs of software, lower IT skills of the teachers, development of predominantly lower cognitive skills, and development of addiction to the use of VR technologies are also marked as limitations in Klimova's (2021) study. VR tasks can be time-consuming and distracting for learners (Chen et al., 2020). Other limitations are reported as lowered learners' attention and level of thinking (Hsu, 2022); slowed down speed in answering questions while not improving accuracy (Rau et al. 2018); reduced confidence (Chen et al. 2019); and elicited mixed feelings (Chen et al., 2020). VR also lacks facial expression tracking and other nonverbal paralinguistic clues crucial for foreign language learning (Kaplan & Gruber, 2021).

On a different note, VR may have accessibility issues because VR developers have not primarily prioritized accessibility concerns. The environments they create often heavily depend on visual elements and interfaces that assume the user has normal vision, good eye-hand control, and physical dexterity. As a result, individuals with disabilities may face difficulty in accessing these virtual worlds (Folmer et al., 2009; Forman et al., 2012). There are various ways to utilize VR in education, but to achieve a more realistic immersive environment, users need to use VR headsets, which can be expensive for learners in different contexts (Sadler & Thrasher, 2021).

Conclusion

To conclude, it can be said that VR has emerged as a promising tool in language learning, with its potential to create immersive environments that simulate real-life situations. Several research has shown that the linguistic skills acquired through VR are effectively transferable to the real world. However, there are still some limitations that need to be addressed to fully apprehend the potential of VR in language learning. Educators need to be trained to use VR effectively in language teaching, including how to integrate it into

existing curricula, how to design effective VR learning experiences, and how to manage the technology in the classroom. Developing VR content that effectively supports language learning demands a substantial investment of time, resources, and expertise. It is essential for curriculum designers to have a thorough understanding of language learning principles, VR technology, and instructional design to create relevant and engaging VR materials.

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