

A Review of Virtual Reality Technology in EFL Teaching

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Abstract. Introduction of VR technology into EFL teaching can change traditional teaching methods by increasing learners' interaction, engagement and motivation. However, studies of VR technology in EFL teaching and learning are scarce. This paper offers a review of current studies on VR-based EFL teaching and learning, encompassing 20 studies published between 2020 to 2022. There are three ESL-related findings in this study: (1) VR is beneficial for EFL learners' listening comprehension, reading comprehension, speaking, pronunciation, vocabulary acquisition and writing. (2) Integration of VR in an EFL lesson can lower students' foreign language anxiety in an authentically fully-immersive context and improve students' interaction; (3) The application of VR can enhance students' intracultural learning, facilitate learners' creative self-efficacy and intrinsic motivation. It is hoped that this review can provide insights for teachers, educators, and software developers to consider the advantages and disadvantages of VR before it is integrated into ESL teaching in EFL classroom.

Keywords: Virtual Reality, EFL, virtual reality assisted language learning (VRALL), foreign language anxiety (FLA), MVR (mobile VR), Task-Based Language Teaching (TBLT).

1. Introduction

Foreign language learning in a traditional classroom setting can be anxious, difficult and forgetful.

Being authentic, immersive and interactive, VR can be a powerful instrument for EFL learning is supported by existing literature. VR-assisted language learning (VRALL) has captured the attention of educators, researchers, universities and companies in recent years. This study aims to present the current developments in the field of utilization of VR in EFL classroom, point out the existing problems and explore future research directions.

2. Theoretical Background

According to the definition of Cambridge Dictionary online, EFL is abbreviation for English as a Foreign Language: the teaching of English to students whose first language is not English. A common assumption is that the best way to learn a foreign language is through language immersion where the language is spoken. However, due to time, space and financial limitations, this is not possible for most EFL learners. Cambridge Dictionary online defined VR as a set of images and sounds, produced by a computer, that seem to represent a place or a situation that a person can take part in. VR allows participants to enter a virtual environment through interactive simulations, giving them the feeling of being fully immersed in a virtual space.[1] VR applications in EFL are based on several pedagogical theories such as ubiquitous learning, self-directed learning, constructivist learning, situated learning, inquiry-based learning, game-based learning, and engagement theory [2].

3. Studies on VR in EFL teaching

Studies have documented the application of VR in EFL teaching and learning from 2020 to 2022. For example, there are two experiments about VR assisted EFL listening comprehension in Taiwan. One is Tzu-Yu Tai & Howard Hao-Jan Chen's experiment in 2021, their study investigated the impact of mobile VR on EFL learners' listening comprehension. [3] Tzu-Yu Tai investigated the impact of MVR on EFL learners' listening comprehension in 2022 again.[4] The results of their

studies revealed MVR-assisted EFL listening is engaging and beneficial. The findings showed that MVR may be a useful tool to promote EFL listening.

In Japan, Yukie Saito investigated the effects of VR English lesson on eight university students . [5] In another experiment, 30 undergraduate Japanese university students participated in a study about how three different computer-mediated communication modalities(voice, video, and virtual reality) may affect EFL learners' foreign language anxiety (FLA). [6] The results of their experiments showed that VR was the easiest environment to communicate in, VR created a fun and effective environment for EFL learning. The findings of their studies suggested VR English lessons might increase students' engagement, reduce EFL anxiety, and improve students' speaking proficiency. Four experiments were conducted on improving EFL learners' speaking by integrating VR

technology in EFL classroom. Xi Li, Ying Xie and Tianqin Liu designed and practiced oral English teaching system based on VR. [7] Yi-chen Chen investigated the effects of technology-enhanced learning on reducing EFL learners' PSA(Public Speaking Anxiety). [8] An experiment was conducted to evaluate the effectiveness of a progressive question prompt-based peer-tutoring approach in VR contexts (PQP-PTVR). [9] Diem Thi Ngoc Hoang, Maggie McAlinden and Nicola F. Johnson investigated the potential of virtual reality (VR) to develop the oral proficiency of EFL students and their perceptions of using VR mobile technology in EFL learning. [10] Their research results showed VR can improve the efficiency of oral English training, the experimental group had more interactions and made more attempts to improve their speaking. The findings showed that the application of VR decreased the students' PSA and the PQP-PTVR approach may enhance learners' speaking proficiency and improve their interactions.

Three studies are related to EFL vocabulary acquisition in VR lessons. One is how the integration of VR technology into PBL contexts affects students' vocabulary acquisition in learning English as a foreign language. 84 engineering majors participated in the study. [11] The other is the effects of VR and PC visual novel game on vocabulary learning. [12] The third one is the impact of a virtual reality app on adolescent EFL learners' vocabulary learning. [13] The results showed that the VR group exceeded those in the control group in terms of vocabulary acquisition, the VR group achieved a much higher score than the PC group in the vocabulary translation delayed posttest. The findings demonstrated that the VR players' vocabulary learning and retention was much better than the control group.

Three studies are about EFL writing. One investigated the impact of VR- enhanced classes on paragraph writing of extrovert and introvert EFL learners. [14] The other studied incorporating a virtual reality tool into the writing process of Iranian EFL lessen. [15] The third investigated the effect of Virtual Reality in developing Al-Azhar secondary stage students' EFL writing skills.[16] The results showed that the experimental group outperformed the control group in both writing motivation and writing performance. The findings revealed that the VR experimental group students developed better EFL writing skills.

Moreover, Hui-Chin Yeh, Sheng-Shiang Tseng & Leechin Heng investigated enhancing EFL students' intracultural learning through virtual reality. The results demonstrated that students developed better intracultural awareness through the features of VR technology including panorama, audio, interaction, and structuring.[17] Yu-Ju Lin & Hung-chun Wang investigated the effect of a virtual reality creative project on 39 EFL learners' creative self-efficacy as well as their intrinsic motivation toward using VR technology. The results indicated that the VR-supported project facilitated the students' efficacy for creative thinking. [18] CHui Ding and Mingyang Qi analyzed a teaching scene-based 5G+ VR technology for situational English teaching. The results proved that the method designed in this study improved performance in teaching effectiveness. [19]

Minoo Alemi & Shiva Khatooni investigated the impacts of Virtual Reality on Iranian young Foreign Language learners' pronunciation. The results of their study revealed that VR was useful in creating an efficient and pleasurable English learning environment. [20] Furthermore, in a Chinese university, a visual prompt scaffoldingbased VR (VPS-VR) approach was introduced to EFL reading course to enhance students' reading comprehension skills. The results revealed the positive effects of

the VPS-VR approach on students' EFL reading comprehension and learning motivation. [21] In Vietnam, the combination of Task-Based Language Teaching (TBLT) and VR mobile technology was integrated into EFL lessons to create an authentic language learning environment. The results showed that TBLT in synergy with VR technology enhanced task authenticity and led to perceived improvements in their language learning.[22]

4. Summary

It is valuable to investigate how to effectively and efficiently use VR technology to improve EFL learners language skills. To sum up, the applying of VR in EFL classroom has the potential to facilitate students' EFL learning. It can promote EFL learners' listening and reading comprehension, enhance speaking development, reduce EFL anxiety, strengthen cultural competence, improve long-term retention and learning enthusiasm. However, problems and limitations still exist, researches and experiments in this field are not sufficient, the implications of VR technology for improving ESL learning outcomes need further investigation. Some suggestions for future research into VR assisted EFL learning are provided below. First, studies on VR courseware evaluation should be done in future to guarantee the teaching and learning effect. Second, future research should examine the effects of different VR hardware, including the quality, weight and the comfort level offered by the VR device. Third, the experiments mentioned in this study were designed as one-time interventions, more repeated-exposure studies need to be conducted to investigate the ESL learning effect of prolonged exposure to VR environment. Fourth, the sample sizes of the above experiments were small, large-scale studies of EFL learning are necessary.

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