

Exploring Chinese EFL Learners' Willingness to Communicate in a Self-Developed 3D Virtual Environment

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Abstract

Willingness to communicate (WTC) has been recognized as a prerequisite for successful foreign or second language learning. Hence, numerous studies have been conducted to improve English as a second language (EFL) learners' WTC. With the advancement of digital technologies, virtual reality (VR) has gained its growing recognition in technology-enhanced language learning. However, few empirical studies so far have been focused on investigating the impact of VR on EFL learners' WTC. To fill the gap, this study set out to explore the potential of a self-developed 3D virtual environment for enhancing Chinese EFL learners' WTC and exploring their perceptions of the VR-assisted English learning approach. Seventy college students from two intact classes were randomly divided into either the experimental group or the comparison group. WTC questionnaires and semi-structured interviews were conducted for both quantitative and qualitative data. The quantitative results indicated that students in the experimental group were more willing to communicate at the end of the experiment than those in the comparison group. Moreover, thematic analysis of the qualitative data revealed that VR players enjoyed interacting with virtual objects and characters, as it helped ease their anxiety and motivate them to communicate in English. In conclusion, this study provided empirical evidence that the use of VR exerts a significant impact on EFL learners' WTC and the majority of VR players held a positive attitude towards the use of VR for English learning. The pedagogical implications concerning VR-assisted language learning are discussed.

Keywords: Virtual Reality, Willingness to Communicate, EFL Learners, Higher Education



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Introduction

For English as foreign language (EFL) learners, improving communication skills has long been considered as a strong incentive to embark on foreign or second language learning (Fernández-García & Fonseca-Mora, 2019). However, EFL learners have long been suffered from insufficient time and opportunities to speak and practice in English (Hung et al., 2023; Tai & Chen, 2020; Tseng & Yeh, 2019). Moreover, they often feel anxious, lack of confidence and fear of making mistakes and receiving negative evaluation in class (Hamouda, 2013; Tai & Chen, 2020). As a result, they are reluctant to communicate with classmates and teachers in English. According to MacIntyre et al. (1998), L2 WTC refers to “a readiness to enter into the discourse at a particular time with a specific person or persons, using an L2” and is regarded as a building block of L2 communication. Therefore, it is of great importance for EFL instructors to find effective approaches to facilitate EFL learners’ willingness to communicate (WTC).

The rapid development of innovative technologies provides new opportunities to meet the needs of language education. EFL learners can now embrace a variety of digital tools to learn the target language (Tai & Chen, 2020). Virtual reality (VR) is a system that creates an immersive, interactive, and stress-free environment (Lloyd et al., 2017), in which learners can obtain much input and has ample opportunities to practice the targeted language. Recent studies have provided important insights into using virtual reality technology in learning languages such as English (Ebadi & Ebadijalal, 2020; Tai et al., 2020), Chinese (Xie et al., 2019), Japanese (Yamazaki, 2018) and Spanish (Melchor-Couto, 2017). In addition, VR is also particularly popular for training linguistic competencies, including speaking (Parmaxi, 2020), listening (Tai & Chen, 2021) and writing (Chen et al., 2020). However, the potential and possible contribution of VR on EFL learners’ WTC still remain unclear. Therefore, the present study set to investigate the impact of VR on Chinese college EFL learners’ WTC and their perceptions of the use of VR for English learning. The study was guided by the following two research questions:

- (1) Does VR technology significantly promote the EFL learners’ willingness to communicate in English?
- (2) What are the EFL learners’ perceptions of VR for English learning?

1. Method

1.1. Participants

A total of 70 sophomores (46 males and 24 females) aged 18-21 years old were invited to take part in this study. They were attending a college English course at a comprehensive university in Chinese mainland, in order to enhance their overall English skills especially speaking proficiency. All participants had at least 6 years of formal English education, and their English proficiency had been confirmed by passing the College English Text Band 4 (CET-4). All the participants were randomly assigned to either the experimental group (i.e. VR players) or the comparison group (i.e. video watchers).

1.2. Instruments

1.2.1. Learning Platform

The self-developed Situational English in Virtual Reality platform (Figure 1) was employed as the experimental device for the current study. By simulating major scenarios and check-in procedures at the international airports (Figure 2), the platform focused on the practical use of English in learners' everyday life and the promotion of their communication skills (Figure 3). Learners could choose any of the seven task modes, such as Practicing (ABCD), On-site Experiencing, Testing and Customization to hone their language skills.



Figure 1: The Self-developed Situational English in Virtual Reality Platform

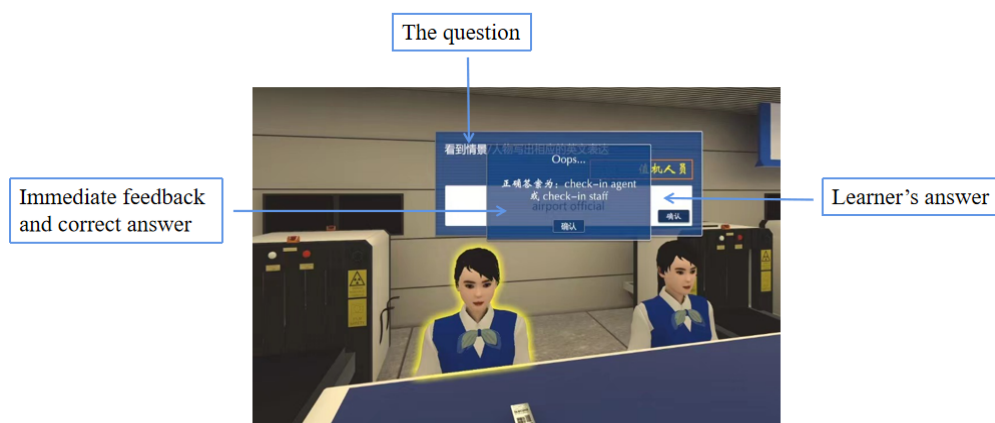


Figure 2: A Question-answer Example in the VR Learning Platform



Figure 3: Example Conversation with a Virtual Character

1.2.2. WTC in English Questionnaire

The WTC in English questionnaire was adapted from Reinders and Wattana's (2014) WTC scale including two dimensions: learners' perceptions of their willingness to communicate and their state of self-perceived communicative competence. The adapted version is a 15-item scale with two dimensions. The first section was composed of five items concerning students' willingness to communicate in English during the experimental process. The second section included ten items exploring students' state of self-perceived communicative competence in a VR learning environment. The internal consistency reliability of the original questionnaire was considered to be good, with Cronbach's alpha values of .76 and .89 for two constructs respectively. The items were presented on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5).

1.2.3. Semi-structured Interviews

Semi-structured interviews were conducted in order to obtain more in-depth insights on the participants' attitudes and perceptions toward the impact of VR on their WTC and English learning. Three interview questions are as follows: (1) Did you find VR activities helpful in terms of facilitating communication in English? (2) What were your favorite parts of the VR experiment that promote WTC? (3) How did you feel about VR for English learning?

1.3. Procedure

This study was carried out for six weeks, with two 45-minute classes each week (Figure 4). To start with, the participants completed a background questionnaire and the WTC questionnaire. In the following week, all the participants were introduced to the operation of Moodle platform. In addition, the VR group was also informed of the basic instructions about the operation of the VR platform. Starting from week three, VR players did learning activities on the VR platform, while the video watchers learned the same content by watching instructional videos on personal computers. In the final week, all participants were asked to complete the post-test WTC questionnaire. Moreover, eight students, four from each group, were chose to participate the semi-structured interviews based on convenience sampling. Students' mother tongue, Chinese, was used through the whole interviewing process in order to ease them and get clear and comprehensive replies. Each interview lasted around 20 minutes through the platform Tencent Meeting, and the interviews were audio-recorded and transcribed for further analysis.

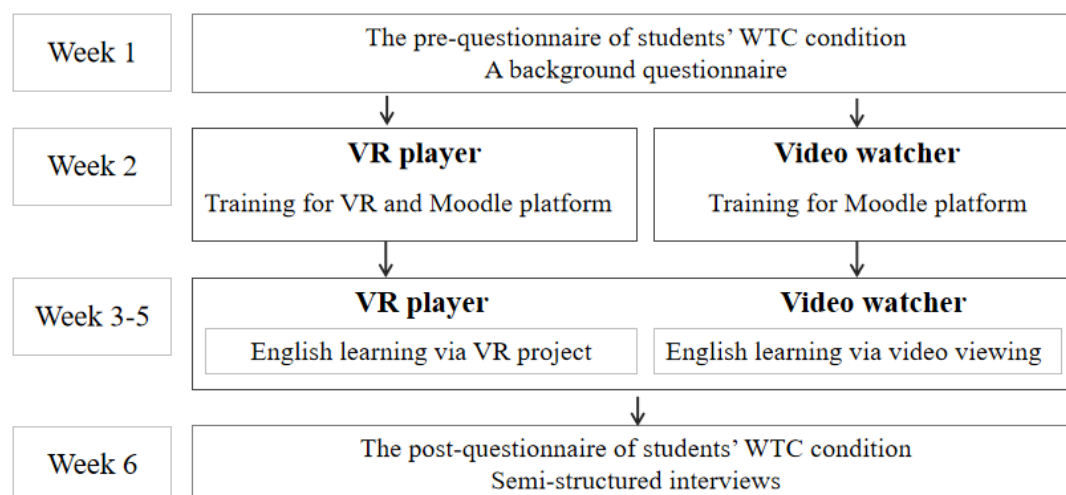


Figure 4: Experimental Procedure of the Study

1.4. Data Analysis

Data analysis consisted of two stages in order to address the research questions. In the first stage, one-way analysis of covariance (ANCOVA) was conducted to analyze the quantitative data obtaining from learners' pre-test and post-test WTC questionnaire, so as to explore the impact of VR-assisted learning approach on learners' WTC in English. In the second stage, the thematic analysis method was used to analyze the qualitative data gathering from participants' responses to the semi-structured interviews, in an attempt to identify and categorize students' individualized and differentiated experiences of VR-assisted English learning. SPSS 25.0 and NVivo 11.0 was employed to analyse the quantitative data and the qualitative data respectively.

2. Findings and Discussion

2.1. Quantitative Results

To investigate whether the use of the desktop VR platform has an impact on participants' WTC, ANCOVA was carried out to examine the quantitative data obtaining from students' pretest and post-test of WTC questionnaires. Descriptive statistics including means, standard deviations, and adjusted means for willingness to communicate between the two research groups are displayed in Table 1.

The quantitative analysis of data evinces that there was no significant difference between VR players and video watchers in terms of their WTC performance at the beginning of the experiment. On the other hand, as illustrated in Table 1, a statistically significant difference was found in WTC between the two groups ($p = 0.04$). Although both groups have improvement in their WTC on the post-test questionnaire, the VR players were significantly more willing to communicate than the non-VR ones, $p = .04$, $\text{partial}\eta^2 = .07$.

Group	N	Before Treatment		After Treatment		Mean (adjusted)	Univariate ANCOVA			
		Mean	SD	Mean	SD		SE	F	p	η^2
Experimental	35	48.43	4.88	53.09	6.16	53.18 ^a	0.9	4.65	0.04*	0.07
Comparison	35	49.91	4.95	50.51	4.25	50.42 ^a	0.9			

Note. * $p < 0.05$

Table 1: Descriptive Statistics of Students' Pre-test and Post-test Scores and ANCOVA Results of Employing VR on EFL Learners' WTC

Given the value of the partial eta squared of .07, it can be concluded that the use of desktop VR has a significant impact on the participants' WTC in English. This finding substantiates that of Ebadi and Ebadijalal (2020), who reported the positive impact of Google Expeditions VR tool on 20 Iranian EFL learners, especially facilitating their L2 WTC. Therefore, we can claim that the desktop VR platform is a beneficial tool to improve the WTC performance of EFL learners.

2.2. Results of Interviews

By analyzing the qualitative data, the most prominent findings were that the desktop VR improved the L2 WTC and English proficiency of these college EFL participants.

The majority of participants were excited and motivated during their engagement in the VR activities. They particularly liked the conversations with virtual airport working staffs who made the interaction more realistic and delivered participants a sense of talking with real foreigners. Moreover, they provided immediate feedback in the process of communication, through which learners could realize their errors and try to modify utterances, so that to help them become more eager and confident to communicate with others. For instance, student VR-01 stated, "I liked talking with virtual airport staffs, because it felt like talking with foreigners. They provided me learning support, such as taking to me with native expressions and helping me check the correctness of my English. Therefore, I became more confident to communicate with airport officials in English instead of just replying OK, Yes, or No.". This finding corroborates with Tai & Chen (2020)'s study, demonstrating that the virtual environments provided students with ample opportunities to interact with virtual officials which helped to practice the target language (Tai & Chen, 2020).

Students also argued the strength of VR in providing a less anxious English learning environment, which increased their participation and bolstered their confidence in speaking English without feeling nervous. For instance, student VR-03 claimed, "I felt nervous to speak English in previous classes, because I was afraid of my classmates laughing at me for my poor English. I liked participating in VR activities, because its relaxed atmosphere helped me deeply comprehend learning materials and say anything without the fear of being judged by the classmates." The findings also align with the suggestion to provide a stress-free atmosphere for learners (Kang, 2005), in which they could avoid environmental distractions and immerse in practising the target language (Bonner & Reinders, 2018), which in turn help to improve their willingness to communicate.

Moreover, the overwhelming VR players indicated that their English vocabulary knowledge have been enhanced with the use of VR tools, and they tended to be more

willing to apply what they had learned in the virtual platform to the real world. Besides, some VR players indicated that some technical issues had distracted their attention.

3. Conclusion

The present study set out to investigate how the application of a VR platform to English language classroom impacts the L2 WTC of 70 Chinese college EFL learners. Results from the quantitative data indicated that the VR platform was of great significance for enhancing EFL learners' WTC. Then the qualitative results shed further light on the initial quantitative findings, showing that despite some technical issues of the VR platform, most VR players held a positive view of the use of VR for their English language learning.

3.1. Pedagogical Implications

The findings of this study indicate the positive impact of VR in facilitating EFL learners' English learning, especially their L2 willingness to communicate. Therefore, it is necessary for teachers to incorporate VR in the design of English-speaking lessons. Besides, as most VR players claimed that VR platform was beneficial and flexible for their vocabulary acquisition during the speaking activities, teachers may therefore employ VR to teach new vocabulary and sentence structures in future English courses (Ebadi & Ebadijalal, 2020; Tai et al., 2020). In such way, students can immerse themselves in virtual environments (Barrett et al., 2020) to acquire new words and sentences, and try to apply what they had learned in their daily lives.

Moreover, the interactive feature of the VR platform has successfully involved players in communicating and interacting with virtual characters (Ebadi & Ebadijalal, 2020). Therefore, the current study suggests that researchers and educators can adopt the VR tools into the instructional design, so as to help improve students' communicative competence and innovate their English-learning approaches.

3.2. Limitations and Future Work

However, this study also has some limitations. First, the sample size was relatively small, and all the participants were the second-year students from one single university, which may hinder the generalization of the research findings. Future research is encouraged to recruit cross-culture participants with larger group members. Secondly, technical issues sometimes occurred during the experimental period such as unstable internet connection, resulting in data losses. Such distractions not only interrupted learners' learning process but also affected their willingness to communicate to some extent (Sally Wu & Alan Hung, 2022). Therefore, technical experts are advocated to optimize the VR platform and teachers need to receive technical training and be prepared to in-time support. Thirdly, the current study only went through a short intervention time of six weeks. Therefore, the positive research findings may be influenced by the novelty effect, because it's the first time for all players to have the experiences of VR-assisted language learning. Future studies are suggested to conduct longitudinal experiment to obtain a more comprehensive understanding about the impact of VR on EFL learners' WTC.

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