OPEN ACCESS
Scholars International Journal of Linguistics and Literature
Abbreviated Key Title: Sch Int J Linguist Lit
ISSN 2616-8677 (Print) |ISSN 2617-3468 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Business Interpreter Training in the 3D Virtual Reality Environment: A Pilot Study in China

HU Pingping[1*]

[1]Wenzhou Business College, Higher Education Park, Chashan, Wenzhou, Zhejiang Province, P. R. China, 325035

DOI: 10.36348/sijll.2023.v06i03.001 | **Received:** 03.02.2023 | **Accepted:** 07.03.2023 | **Published:** 11.03.2023

***Corresponding author:** HU Pingping
Wenzhou Business College, Higher Education Park, Chashan, Wenzhou, Zhejiang Province, P. R. China, 325035

Abstract

As virtual technology develops, it holds greater potential of application in different educational sectors, and computer-assisted interpreter training is no exception. While the last decade has witnessed development and implementation of VR-mediated interpreter education projects, more empirical evidence is still lacking and therefore warrants the academia's attention. This pilot study intends to find out users' experience, opinions about the affordances and challenges of a desktop VR training platform in the context of business interpreting. A mixed-methods approach was used integrating data from both close-ended and open-ended questions. Results showed that users held largely positive and converging views about the VR interpreting experience, in terms of the ingenuity, sense of presence, and the effectiveness of the platform in improving a variety of interpreters' competence. Users also pointed out several challenges, such as equipment, design, physiological effects but the opinions were quite diverging.

Keywords: Virtual Reality (VR), business interpreting, Computer-assisted interpreter training (CAIT), interpreter education.

1. INTRODUCTION

As a highly interactive and multimodal practice (Davitti, 2013), intensive training is required in real settings. Situated learning and tremendous amount of autonomous practice are among the top requirements of interpreter training (Sandrelli, 2015). It is posited that through training in a lifelike situation trainees can better prepare themselves both cognitively for future interpreting tasks, and enhance their interaction competence. Nevertheless, trainee interpreters do not often have access to these real-life practice opportunities, like sitting in a dummy booth interpreting for a conference or go to the field for a paid interpreting assignment. Usually the best solution is to organize moc-conferences role-played by fellow students, which might help with situated learning, but still it is not without limitations, such as unnatural role-playing. With technological innovations, 3D virtual reality (VR) technology has gained prevalence and popularity. It has already been widely applied in the education sector. Though having only entered the stage of computer-assisted interpreter training (CAIT) just ten years ago, VR has been tested for use in interpreter training in the shape of VR platforms, on which students can interact as avatars in virtual learning environments (VLEs) simulating specific settings of professional practice (Braun *et al*., 2013). VR-mediated interpreter training might prove a promising avenue of research, for its potential benefits to assist situated and autonomous learning, blended learning and collaborative learning, particularly at the age of distance learning prevalent in the post-pandemic era. Several empirical studies have been carried out to explore the effectiveness of this new pedagogical approach in interpreter training, however, converging evidence is still lacking in this nascent field of study. Much remains to be found about the affordances and limitations of this new form of CAIT. It is against this backdrop that the current study intends to contribute to the discussions on the pedagogical design. This paper will start by reviewing the past decade's research into the VR-mediated interpreter education and the design of a pilot study, which will be followed by major results and discussions.

2. LITERATURE REVIEW

Due to the limited size of literature with regard to the topic of this study, the author searched for as many publications as it could possibly be done. Three key databases were identified before the search: the Web of Science Social Sciences Citation Index (SSCI), Bibliography of Interpreting and Translation (BITRA, with over 90000 entries, being the largest

database devoted solely to translation studies) and the Chinese Social Sciences Citation Index (CSSCI). CSSCI as a Chinese database was also included due to two reasons: on the one hand, the "the Chinese and international communication systems in the social sciences are almost completely uncoupled in terms of the coverage in the databases."(Zhou *et al*., 2010, p.1362) On the other hand, China has witnessed a burgeoning interest in using VR technology in empowering interpreter education and therefore the relevant literature warrants our attention. Terms of key words such as 'virtual reality+interpret*', 'virtual world + interpret*', 'virtual learning environment + interpret*' were used for the search. Besides direct return of search results, the references of the publications that fit for our purpose were also screened to retrieve any literature missed. Moreover, publications with the topic of CAIT were also screened to gather as much information as possible.

A review of the literature reveals two very clear streams of research, the first one was concerned with the conceptual designs and implementations of VR-mediated interpreting training projects; and the second one dealt with empirical studies to explore the effectiveness of these projects. Along the first line of research, the majority was centered around EU's IVY project [i] launched between 2011-2013 (see Ritsos *et al*., 2012; Ritsos *et al*., 2013; Braun *et al*., 2013 and others), as an attempt to address the challenges brought about by the changing demands of profession (Ritsos *et al.*, 2012), changes in training requirements due to the changes in the professional landscape and reduced teaching hours (Braun *et al*., 2013) as well as the fact that real professional practice might not be always accessible for trainee interpreters to satisfy the need for "situated learning" (Braun & Slater 2014). The IVY projects capitalized on the new generation of ICT-based tools and platforms (such as web 3.0 and 3D virtual world) which were growing in popularity for the potential to provide dynamic and comprehensive support for teaching and learning, but were then still a novelty in interpreter training. As far as the 3D virtual environment is concerned, an online multi-user, collaborative avatar-based visual world named Second Life, the "most widely used public-facing 3D environment" (Braun *et al*., 2013, p.99), was used to create different virtual reality settings such as conference centers, business meeting rooms, courtrooms and so on. Four working modes were made available on the platform, namely, interpreting practice, exploration, learning activity and live interaction, through which autonomous and collaborative learning were made possible. Moreover, the education of interpreters and their clients were integrated closer together. Some introductory articles focused on giving a more general picture about this first project to introduce virtual world in interpreter education (Ritsos *et al.*, 2012; Ritsos *et al.*, 2013; Braun *et al.*, 2013; Deng 2016; Liu 2016, 2018; Jiang & Peng 2018); while others went a step further into design details of this project, such as the "template-based approach" to develop bilingual dialogues for the IVY 3D environment (Braun & Slater 2014). Inspired by the IVY projects, a variety of institutions joined in and rolled out their own VR-mediated interpreter training platforms. Detailed introductions to the design of these project/teaching models/projects were given, such as ÇEV-VİR in Turkey (Eraslan *et al.*, 2020), PIIT in China (Zhang & Zhou 2021) and the VR training project in the context of home violence in Australia (Gerber *et al.*, 2021). These studies updated the academia about development in VR training projects and were very inspiring for future projects.

The other line of research was empirical, which looked into the actual implementation and evaluation of the projects. Like the introductory vein of studies, the majority of empirical studies at the earlier stage centered around the IVY project, such as the prototype evaluation by interpreting and visual world experts was undertaken through talk-aloud and try-out sessions in Second Life (Ritsos *et al.*, 2012; Braun *et al.*, 2013; Ritsos *et al.*, 2013) and the learning process taken as the focus of evaluation in Braun *et al.* (2015), as well as comparison of the IVY project with other virtual learning environments (Tymczyńska *et al.*, 2013; Braun *et al.*, 2020). As more projects followed, the empirical studies were contributed by a few other teams, to look into learning outcomes that could take place in the 3D-VLEs, for example, learning experiences (Chan 2022), affordances (Eser *et al*., 2020; Braun *et al.*, 2020), interpreting performance (Zhai 2019; Mei 2019; Eraslan *et al.*, 2020; Chao 2021), cognitive load (Chao 2021) and other benefits (Chan 2022) and challenges (Braun *et al.*, 2020; Eser *et al.*, 2020). Empirical data gleaned both from qualitative methods and quantitative methods suggested that virtual environment was positively recognized by participants (both students and professional interpreters) to support collaborative learning, situated learning and autonomous learning (Braun *et al.*, 2020; Eraslan, *et al.*, 2020). The VR-mediated training was considered to be innovative, interesting, useful, enjoyable, practical, promising, effective and motivating (Zhai 2019; Eraslan *et al.*, 2020; Eser *et al.*, 2020) but also with some limitations, such as constraints relating to functionality and design (Chan 2022); physiological effects, equipment, technical support, level of authenticity and inability to use skills such as note-taking while in the VR environment (Eser *et al.*, 2020); as well as content variety and realism (Eraslan *et al.*, 2020). These empirical studies have contributed a lot to our knowledge as for how good the VR training actually worked and was received by users. Another notable contribution from these studies is that the data collection methods used in the evaluations were quite comprehensive and adopted with scientific rigor, such as ethnographic and observational methods including e-diaries, video-recorded activities, reflective sessions

(focus groups, introspection and stimulated recalls, and in-depth interviews), questionnaire surveys using instruments such as UEQ [ii] and particularly linguistic analysis of the recorded simulations. These evaluation methods serve to be good examples for future studies.

Despite empirical data and successful results created in the past studies, empirical research and data is still lacking both in number and in diversity. As a result, the validation of the results still needs more "hard empirical data" (Kajzer-Wietrzny & Tymczyńska 2014). Moreover, the existing studies and platforms involved concern mainly community interpreting (medical and court interpreting), with a couple of platforms dealing with conference interpreting. However, business interpreting training in the VR platform is quite rare, the few including only Qin & Qin (2022) to the best of the author's knowledge.

3. RESEARCH QUESTIONS AND DESIGN

The current project is part of a larger project to explore the effectiveness of learning process in the context of VR-mediated training. It was intended to be a pilot project for follow-up studies. This pilot study aims at finding out how do students feel about the VR-training platform in terms of the affordances and challenges. Participants were required to log on a website which hosts VR-training platforms and took part in the simulated whole-process of interpreting. This pilot project took place at the university where the author is based and where she teaches a busienss interpreting course to senior English majors. The pilot study sets out to address the following three research questions:

1. What was the users' experience with the VR training platform for business interpreters?
2. What are the views of students on the affordances of the VR training platform for business interpreters?
3. What are the views of students on the challenges of the VR training platform for business interpreters?

The current study adopted a mixed-methods approach. Quantitative data were collected through a questionnaire designed by the author regarding the opinions on the affordances and challenges while qualitative data were gathered through open-ended questions. The qualitative data were meant to provide a more thorough understanding about students' views.

4. METHODOLOGY

4.1 The virtual reality platform

The virtual reality platform was developed by a team of interpreting teachers from a university located in a Southeastern City of China and was available for test use on the website of National Virtual Reality Learning Resources Sharing Platform ("国家虚拟仿真实验教学课程共享平台") [iii]. The platform offers a desktop virtual learning environment accessible from a regular laptop computer with Internet connections. Built for the purpose of business interpreter training, the platform simulates the whole process an interpret would normally experience when taking part in an overseas investment project. After logging in, the user becomes the interpreter, who has to first take on a trial interpreting, get the offer, receive the task brief, finish the preparatory work and then embark on the journey to an overseas investment fair where he/she would interpret for the manager on several scenarios such as exhibitions, interviews, press conferences, business negotiations, etc. Besides lifelike simulations of the interpreting experience, the platform provides functionality import for autonomous training, such as options of task difficulties (with/without noises, consecutive or simultaneous, speed adjustment, with/without subtitles) and recording, rating and AI assessment of performances based on transcripts. Students could also download their scripts of recordings and take part in the reflective session after finishing the interpreting.

4.2 Participants

Twenty-two senior English major students participated in this study. They were all Chinese natives with Chinese as their L1 and English as their L2. They had gone through a semester of business interpreting class during their junior year when they learned and practiced basic interpreting skills. When this pilot study took place at the end of the semester, they had gone through a semester of specialized training in business interpreting, involving different contexts such as interviews, negotiations, trade fairs, trade talks, etc. So they had mastered the knowledge and skills to take on an interpreting task, yet nearly none had the chance to land on a part-time paid interpreting job. Participants were required to test the platform before class and finish the preparatory tasks beforehand. Students brought their own laptops to the class and then finished the interpreting task on their own in the class after the teacher gave them basic instructions. During the interpreting, the teacher stood by to provide any necessary technical assistance.

4.3 Data collection and analysis

After the students finished interpreting, a questionnaire was administered to them and they were told to gave their true ratings. The survey used five Likert-scale questions (1 stands for strongly disagree and 5 stands for strongly agree). They contained twelve questions regarding the user experience, fifteen questions regarding the affordances in terms of the interpreting competence improvement and ten questions regarding the challenges of the training platform. Altogether twenty-two questionnaires were sent out and all of them were returned on site. SPSS 26 was used to run the data collected through the Likert-scale questions and NVivo 11 was used for coding answers to the open-ended questions through the bottom-up approach.

5. FINDINGS

The internal consistency of the scales was assessed using Cronbach's alpha. The values were .947, .977 and .693 respectively for the user experience scale, views on affordances scale and views on challenges scale, and .939 for the instrument as a whole; indicating that the reliability was either excellent or adequate.

5.1 Students' user experience

Descriptive data (Table 1) showed that the participants felt most strongly about the innovations they experienced on the VR training platform (*M*=4.5, *SD*=.67) and they strongly agreed that the training platform could improve motivation for interpreting practice (*M*=4.23, *SD*=.69), as well as improve their knowledge about business interpreting (*M*=4.27, *SD*=.70) and global business activities (*M*=4.23, *SD*=.75). Besides that, they were generally positive about the authenticity of their VR interpreting experiences, materials and roles, as well as as the sense of presence ($M > 4.0$). They felt that the platform offered comprehensive training and timely feedback on their interpreting performance ($M > 4.0$), and the practice gave them a sense of fufilment (*M*=4.0, *SD*=.82). The responses were generally quite positive, except for one question that whether they felt a sense of security (as in contrast to fears trainee students often harbor in interpreting scenarios). They didn't seem to agree that much (*M*=3.86, *SD*=.77).

Table 1: User experience of using the VR training platform

Q#	Question	Min	Max	Mean	SD
1	I think the training platform is very innovative	3	5	4.50	0.67
2	I think the intepreting experiences are authentic	3	5	4.14	0.77
3	I think the interpreting materials are authentic	3	5	4.09	0.75
4	I think the interpreter's role is real	3	5	4.00	0.69
5	I think the training is comprehensive	3	5	4.18	0.73
6	I feel a sense of presence	2	5	4.05	0.90
7	I think the training platform enhances my motivation	3	5	4.23	0.69
8	The training improves my understanding of global business activities	3	5	4.23	0.75
9	The training improves my understanding of business interpreting	3	5	4.27	0.70
10	I feel a sense of security when interpreting on the VR platform	3	5	3.86	0.77
11	I feel fulfilled after finishing interpreting on the VR platform	3	5	4.00	0.82
12	The system's automatic feedback is timely	3	5	4.14	0.71

The qualitative data coding (Table 2) revealed that the majority of student agreed that the VR training platform felt very real and they enjoyed the sense of presence (*N*=19). Four students acknowledge this form of training to be very innovative and four respondents agreed the VR training platform helped with improving fast transfer. It seems that to the students, the authenticity of settings, tasks and materials and the innovative training method were underlying reasons for the training to be conducive to fast transfer, but also motivating (*N*=2), reducing dependence on notes (*N*=2) and prompting students to be more focused (*N*=2). Beside these benefits, a few students also commented on good visual effects (*N*=1), helping overcome nervousness (*N*=1) and helping with memory training (*N*=2). One respondent even mentioned that the authenticity placed higher requirement on training.

Table 2: Categories of benefits from the qualitative analysis

Theme/Category	Frequency (*n*=22)
Real, sense of presence	19
Innovative	4
Conducive to fast transfer	4
Motivating	2
Reduce dependence on notes	2
Tend to be more focused	2
Good visual effects	1
Overcome nervousness	1
Helps with memory training	1
More demanding	1

5.2 Students' views on the affordances of the VR training platform

According to the descriptive analysis (Table 3), the VR training was regarded by participants as helpful in improving their interpreting competence, with the mean grades all exceeding 4.0 except for only one item. The competences most notably enhanced were awareness for preparatory work (*M*=4.45, *SD*=.67), professional quality (*M*=4.41, *SD*=.73), transfer competence (*M*=4.36, *SD*=.73), socio-cultural knowledge (*M*=4.36, *SD*=.66), bilingual competence (*M*=4.36, *SD*=.73) and business communiation skills (*M*=4.32, *SD*=.84). Other areas of improvements were in specialized knowledge (*M*=4.23, *SD*=.81), industrial knowledge (*M*=4.14, *SD*=.83) and knowledge about global commerce (*M*=4.27, *SD*=.83); as well as some soft skills such as technological literacy, logical thinking and abilities to learn. Although the VR training was held to be largely beneficial, it was not regarded as very effective in some aspects, such as improving teamwork or improving encyclopaedic knowledge.

Table 3: Views on the affordances of the VR training platform

Q#	Question	Min	Max	Mean	SD
1	Training on the VR platform improves bilinual competence	3	5	4.36	0.73
2	Training on the VR platform improves business communication skills	3	5	4.32	0.84
3	Training on the VR platform improves socio-cultural knowledge	3	5	4.36	0.66
4	Training on the VR platform improves specialized knowledge	3	5	4.23	0.81
5	Training on the VR platform improves transfer competence	3	5	4.36	0.73
6	Training on the VR platform improves knowledge about global commerce	3	5	4.27	0.83
7	Training on the VR platform improves encyclopaedic knowledge	3	5	3.95	0.84
8	Training on the VR platform improves industrial knowledge	3	5	4.14	0.83
9	Training on the VR platform improves logical thinking	3	5	4.27	0.77
10	Training on the VR platform improves professional quality	3	5	4.41	0.73
11	Training on the VR platform improves teamwork	3	5	4.05	0.79
12	Training on the VR platform improves abilities to learn	3	5	4.27	0.77
13	Training on the VR platform improves technological literacy	3	5	4.23	0.75
14	Training on the VR platform improves physiopsychological quality	3	5	4.14	0.83
15	Training on the VR platform improves preparation awareness	3	5	4.45	0.67

5.3 Students' views on the challenges of the VR training platform

Compared with the items on benefits, questions related to challenges got remarkably lower scores, indicating that the training platform was viewed more positively than negatively. That being said, the descriptive statistics (Table 4) did reveal some constraints and might point directions for future design improvement. For starters, technical issues was the most prominent concern, such as the PC hardware (*M*=4.09, *SD*=.81) and the technical hiccups while operating the platform would spoil the experiences (*M*=3.95, *SD*=.90). Beside these, mild concerns were raised about high requirement of venues (*M*=3.64, *SD*=.79). Other negative opinions didn't flag up any serious concerns judging by mean score (c.a. 3.0 or less), however if we look at the standard deviation, we would find that the views were quite diverging. Therefore, it is highly likely that a few students found the interpreting experience unpleasant, quite boring and had issues with negative physical or psychological effects. Some students deemed the design to be in need of improvement because the avatars lack gestures and facial expressions, and some found the interpreting materials too difficult. However, it was highly likely that others did not take those issues as problematic at all.

Table 4: Views on the challenges of the VR training platform

Q#	Question	Min	Max	Mean	SD
1	It has high requirement of computers	3	5	4.09	0.81
2	It has high requirement of venues	2	5	3.64	0.79
3	Technical problems interfere with the platform experience	2	5	3.95	0.90
4	Unpleasant experience on the platform	1	5	3.14	1.08
5	The materials are monotonous and boring	1	5	2.95	1.09
6	Avartars lack gestures and facial expressions	1	5	3.27	1.32
7	Negative physical effects	1	5	2.5	1.14
8	Negative psychological effects	1	5	2.27	0.99
9	Unfamilarity with the platform affects the experience	1	5	3	0.98
10	The VR interpreting was too difficult	1	5	3.09	1.15

The qualitative data (Table 5) further validated the findings from the quantitative analysis. Materials was top on the list (*N*=6), but views were at extremes. For example, two students complained about the interpreting materials to be too difficult, while four students though the diversity and richness of the materials could be improved. Generally speaking, students were more concerned about the technical issues, such as the design of settings (*N*=5), equipment (*N*=4) and the negative effect of dizziness (*N*=4). Few students also suggested that AI evaluation, accessibility and interaction could be improved.

Table 5: Categories of challenges emerged from the qualitative analysis

Theme/Category	Frequency (*n*=22)
materials	6
design	5
dizziness	4
equipment	4
authenticity	2
AI evaluation	1
audio recording	1
difficulty to use	1
interaction	1

6. DISCUSSION AND CONCLUSION

Generally speaking, the students held positive views regarding the use of VR platforms to practice business interpreting, which concurs with existing findings that 3D virtual learning environment is capable of supporting situated learning and autotomous learning (Braun *et al.*, 2020; Eser, 2020). Like literature has shown, the VR application in interpreting training is largely viable (Braun *et al.*, 2013). The advantages are quite obvious, such as being innovative, motivating and promising (Zhai 2019; Eraslan *et al.*, 2020; Eser *et al.*, 2020). The current pilot study has shown that the platform used was overwhelmingly regarded as very real, giving a true sense of presence. It is believed that this positive attitude stemmed not only from the avatar design and the aesthetics, but more importantly from the simulation of the full interpreting process. The participants have also largely agreed upon the effectiveness and practicality of this training platform to enhance the interpreting competence of students, particularly the on-job professional quality, transfer and linguistic competence as well as profession-related knowledge, which was not identified in the existing research. Another feature proven to be important was the AI automatic assessment. Student's highly positive response to the timely feedback showed that the AI assessment would become an important functionality for future VR project. Last but not least, it was also worth noting that two benefits were identified in this study, that the prerecorded dialogues and the pre-set turn-taking prompted students to produce their interpreting fast and urged them to be more focused.

As for the challenges, the students were quite tolerant and commented much less on this category compared with benefits. Among what had been posted, the students were concerned most with difficulty of materials, technical issues and functionality, which also seemed to be a major constraint in other studies (Eser *et al.*, 2020; Chan 2022). Content variety and realism were also in need of improvement (Eraslan *et al.*, 2020). Interestingly, the opinions about challenges were quite diverging, in contrast to the converging positive opinions. The author believes this could be attributed to individual difference, such as interpreting competence, attitude toward interpreting, motivation levels and also different physiopsychological attributes. Nevertheless, despite the negative viewpoints, students were very excited about the new form of training, which demonstrated the attitudes of this generation of "Digital Natives" with regard to new technology application in their classrooms. It also testifies to the necessity and future potential of moving ahead with CAIT.

Several limitations of the current study must be duly mentioned. Firstly, it was a pilot study to identify students' general attitudes toward interpreting in the 3D virtual learning environment, therefore, it consists merely an explory step in the path to a more fully-fledged project. Secondly, the sample size was not large enough to reach any generalizable conclusions. Thirdly, the qualitative and quantitative data collected reflect nothing more than subjective evaluations of the participants, which could be biased in many senses. Fourthly, this pilot study was cross-sectional, while to look into the learning process of how VR could actually assist in interpreter training, a longitudinal study with meticulous design would have much more merits.

As VR industry expands rapidly, its application in other education sectors has also gained pace. Increased calls for autonomous learning, blended learning and situated learning from interpreter tutors, especially in the post-pandemic era, have already been addressed by more institutions rolling out their VR project in interpreting. Countries like China have also provided strong stimuli in forms of government policy and funding support at the national level [iv]. Therefore, it can be reasonably assumed that the VR application will enjoy a bright prospect in CAIT, and more

empirical studies are strongly urged to shed more light on how to actually make it happen.

ACKNOWLEDGEMENT

This research is supported by the Education Reform Project of Wenzhou Business College titled " CAIT Practice Based on VR Technology in Business Interpreter Education" (Grant number: 2020XJJY07) and the Zhejiang Province's Offline First Class Course "Business English Interpreting".

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Notes

[i] IVY (Interpreting in Virtual Reality), EU Lifelong Learning Programme 2011-13, project 511862-LLP-1-2010-1-UK-KA3-KA3MP; co-ordinator University of Surrey, UK; with financial support from the European Commission.

[ii] User Experience Questionnaire, a tried and tested questionnaire for interactive products such as Virtual Learning Environments, http://www.ueq-online.org/.

[iii] https://www.ilab-x.com/

[iv] China's Ministry of Education pledged to reform education by building more VR laboratories as included in the "Forty Articles for Higher Education in the New Era" issued in 2018 (source: http://www.moe.gov.cn/srcsite/A08/s7056/201810/t20181017_351887.html).