

# Effects and Causes of VR-Supported Interpreting Learning Environment on the Interpretation Classroom Anxiety of Student Interpreter

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## Abstract

Interpreting activity is considered a high-anxiety activity due to its immediacy, multitasking, complexity of cognitive processing, and uncertainty of cognitive processing. Research has shown that interpreting anxiety, as the biggest emotional obstacle in the interpreting process, is the main emotional factor that leads to individual differences in interpreting. Students often claim to have fear or anxiety behaviors in interpreting exams, interpreting competitions, and interpreting classes. However, the research on interpreting teaching attaches importance to the cultivation of language knowledge, cultural knowledge, and interpreting skills, and does not pay enough attention to emotional factors such as motivation and anxiety in interpreting learning, which makes it difficult for the cultivated interpreters to meet the requirements of professional practice. In recent years, virtual reality technology (VR) has been gradually applied in the field of foreign language and interpreting teaching for creating a real, interactive and experiential language learning environment. Situated Learning Theory stresses that the fundamental mechanism for learning to take place is for individuals to participate in the real context in which knowledge is generated, and to realize the construction of knowledge through the interaction with the community of practice and the environment. Virtual reality technology can satisfy the needs of language learners for real contexts by providing learners with immersive, imaginative and interactive scenario simulations, and has a certain positive effect on alleviating learning anxiety. Therefore, relying on the virtual simulation course “United Nations Kubuqi International Desert Ecological Science and Technology Innovation International Volunteer Language Service Practical Training System”, this paper adopts a combination of quantitative and qualitative analyses to in-

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investigate the interpretation anxiety level of the interpreter trainees and the factors affecting them in the VR situation to help them discover effective responses to interpreter anxiety.

## Keywords

Interpreter Anxiety, Virtual Reality, Situated Cognition and Learning

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## 1. Introduction

Interpretation learning is a challenging task in foreign language skills learning, and the immediacy and multitasking of interpreting bring a considerable degree of anxiety to interpreting learners and even professional interpreters. The research of Dong has shown that interpreting anxiety, as an important factor affecting interpreting results and interpreting quality, has a certain impact on interpreting at different levels of anxiety [1]. In interpreting exams, interpreting competitions, and interpreting classes, students often report “physiological reactions such as sweaty palms, rapid heartbeat, and abdominal pain; or psychological frustration, disappointment, and not knowing what to do; or communicative fearful behaviors such as avoiding the teacher’s gaze and skipping class” [2]. Or even the appearance of a “The brain goes blank”, resulting in “impaired listening ability, inability to concentrate, impaired memory ability, and poor, inaccurate, and incoherent information output” [3]. Therefore, the study of interpreting anxiety is of great significance in improving the interpreting quality of interpreting trainees as well as the training of professional interpreters.

VR technology, with its characteristics of multi-media, interactivity, perceptual, contextual, flexibility of learning guidance, and controllability of learning content and progress, is an important tool to improve the quality of foreign language learning. It has brought new means of interpreting teaching and training. Theoretical and practical studies have confirmed that interpreting is a language activity highly related to contextual factors, and the absence of any contextual factors may affect the quality of interpreting. While the learning environment created by VR technology is able to satisfy the shortcomings and deficiencies of the traditional interpreting classroom in terms of situation. At the same time, some studies have shown that VR technology can not only provide learners with immersive, imaginative and interactive scenario simulation to meet the needs of language learners for real context, but also help to alleviate the anxiety of foreign language learning and enhance the comprehensive application of language skills [4].

This study focuses on the mental situation of interpreter learners in the virtual reality situation, *i.e.*, interpreter anxiety, which is a key psychological element affecting the quality of interpreting. This study adopts a mixed method of experiments and interviews to explore the effects and causes of VR-supported interpreting learning environment on the interpretation classroom anxiety of student

interpreters.

## 2. Literature Review

### 2.1. Interpreting Anxiety

In 2006, Chiang pointed out that interpreting anxiety should be distinguished from general anxiety and foreign language anxiety in general, and defined interpreting anxiety as an anxiety with both contextual and language skill characteristics. It is both the fifth type of language skill anxiety alongside listening, reading, interpreting and writing in the framework of foreign language learning anxiety, and distinguished from general foreign language learning anxiety due to its interpreter-specific contextual characteristics [5]. Kang proposed that interpreting anxiety is an anxiety phenomenon caused by the immediacy of interpreting, the complexity of the source language, the dissimilarity between the structure of the source language and the target language, and abnormal psychological factors when interpreting for beginners, especially students. He pointed out that interpreting anxiety can have a great impact on interpreting effect, such as showing better interpreting effect in usual training, while in interpreting examination, they may not perform well due to anxiety. Through empirical research, it is found that there are different levels of interpreting anxiety, such as high, medium and low, which have different effects on the interpreting effect [6].

For the causes of interpreting anxiety, most of the qualitative research methods are adopted, such as theoretical generalization, empirical summaries, interviews, etc. Chiang summarized the sources of interpreting students' learning anxiety through students' interviews, and categorized them into five aspects: the speaker, the listener, the interpreter himself, the interpreting task, and classroom procedures. According to Gong, anxiety in interpreting firstly arises from difficulties in listening comprehension, *i.e.*, anxiety and agitation due to incomprehensibility, and that incomprehensibility and the state of anxiety are causative of each other, interacting with each other in a vicious circle. In addition, because the interpreting process requires the interpreter's attention to be highly concentrated, this high-intensity task will cause the interpreter to produce psychological pressure and cognitive difficulties, and cause errors in interpreting, and the production and awareness of errors will lead to greater pressure and cognitive difficulties, forming a vicious circle of pressure-error-pressure, and in serious cases, anxiety may also lead to the failure of interpreting. Hu, on the other hand, pointed out that interpreters' stress mainly comes from biological factors, personality factors, cultural factors, environmental factors and cognitive factors [7]. On this basis, Kang classified the motivation of interpreting anxiety into two categories: extra-verbal and intra-verbal factors. And the sub-factors included in the extra- and intra-verbal factors were shown through the chart. According to the influencing factors, he carried out an empirical study on students with different levels of anxiety, and the results of the study showed that high-level and low-level anxiety has a negative impact on interpreting and interferes with the

interpreting process in terms of memory, reproduction, and conversion, while intermediate-level interpreting anxiety does not have a negative impact on the completion of interpreting tasks, on the contrary, it acts as a facilitator because appropriate anxiety can activate the control of language areas of brain cells that control the language area.

For the measurement of interpreting anxiety, scholars have mostly used general anxiety scales or foreign language learning anxiety scales to measure interpreting anxiety, such as the State-Trait Anxiety Inventory (STAI). With the development, scholars have gradually incorporated the characteristics of interpreting based on these existing scales to measure interpreting anxiety more accurately and appropriately. Chiang defined interpreting anxiety as a kind of context- and skill-specific anxiety alongside specific foreign language skills such as speaking, listening, reading and writing. On this basis, he designed the Interpreter Classroom Anxiety Scale (ICAS).

The ICAS consists of 44 items and was administered to 327 Taiwanese university students taking Chinese-English interpreting courses. The scale is based on the design principles of the Foreign Language Classroom Anxiety Scale (FLCAS) and takes the characteristics of listening anxiety and language organization anxiety in the process of interpreting into account, with a standardized design, and the reliability of the questionnaire reaches Cronbach alpha 0.94 after the initial interviews and after the questionnaire has been modified. This study also did the research based on this scale.

For the research on interpreting anxiety relief strategies, it is worth mentioning that Deng mentioned in her own thesis that when examining the anxiety change status of student interpreters in the interpreting scene, it was found that the student interpreters' anxiety was significantly reduced after they were familiar with the interpreting service recipients, the scene environment and the speaker's rhythm, and even if they realized that there was a mistake in the scene, they were still able to use interpreting strategies to make corrections and additions.

## 2.2. Interpreting Learning Supported by VR

Virtual Reality, also known as Spiritual Realm Technology, which is based on computer technology, comprehensive use of three-dimensional graphics technology, simulation technology, simulation technology and other scientific and technological achievements, to produce a realistic three-dimensional visual, tactile, olfactory and other sensory worlds, thus enabling people to produce a sense of immersion in the virtual environment, direct observation of the surrounding environment and the intrinsic changes in the object, and the model can interact with each other and produce the same feedback information as the real world, so that people get the same feelings as the real world, so that people and computers become one, giving people the feeling of being in the real world [8]. With the development of sensor technology and other technologies, VR technology has

been widely used, which can break through the limitations of space and time, so that human beings can experience the scenes that are impossible to contact or very expensive like immersive, so it gradually plays an important role in many fields, and is also known as a new technology for educational applications in the 21<sup>st</sup> century [9].

The first time VR technology was used in an interpreting learning programme was the IVY project. In this project, digital interpreting resources are embedded in the virtual community of Second life, and 3D virtual technology is used to create a multi-dimensional interpreting learning scene on the web. Zhai constructed an integrated teaching mode of consecutive interpreting and public speaking under the guidance of multimodal theory and contextual learning theory by using virtual reality technology as an aid [10]. Zhang, Y.J. and Zhou, J. proposed a VR and AI-enabled immersive contextual interpreting teaching mode by combining the situational elements in interpreting activities, which provides a new perspective for interpreting learning and research in the intelligent era [11]. In recent years, colleges and universities have also carried out theoretical and practical exploration of interpreting teaching and language services based on VR technology. VR has unique advantages and application potentials in promoting knowledge construction and meaningful learning of language learners, and has attracted much attention from the academic community [12].

### **2.3. Anxiety Alleviation Supported by VR**

The methods of anxiety relief also have implications for interpreter anxiety relief.

In recent years, with the continuous development of VR technology, the fields of its application have become more and more extensive, and clinical studies have provided evidence that VR has a positive role in the clinical assessment and management of many psychological symptoms such as anxiety, fatigue, and fear, etc.

However, it was as early as the 90s that VR has had promising applications in science and medicine, including intervention delivery [13]. VR is one of the strategies that have been identified as cognitive-behavioral intervention. These interventions are thought to affect symptoms by changing symptom-related thoughts, diminishing those beliefs that exacerbate symptoms, and increasing personal perceptions of control over symptoms [14] while the efficiency of a VR intervention on relieving anxiety and depression has been evaluated. The use of VRET for clinical purpose on anxiety and depression has been investigated empirically for many years and it is showing that the use of VR as an intervention in clinical settings has important positive effects on depression and anxiety level. However, foreign language anxiety shares many commonalities with general anxiety psychology.

As one of the strategies of cognitive-behavioral interventions, studies have shown that VR exposure therapy is able to alleviate anxiety by alleviating the reduction of the mental activities that exacerbate the symptoms and increasing

personal perceptions of symptom control, among other things, to alleviate anxiety [15]. Meanwhile, studies have also shown that in language learning, virtual reality technology can alleviate learner anxiety and enhance learner autonomy and interest in learning to a certain extent [16].

Therefore, this study focuses on interpreting anxiety of interpreting learners in the environment created by VR technology, and explores the specific effects of virtual reality situations on interpreting anxiety in order to validate the findings and conjectures of previous scholars. It also provides constructive suggestions for the subsequent development of the integration between virtual reality teaching and interpreting training.

### 3. The Study

#### 3.1. Questions

In the current era of digitization and artificial intelligence, the application of VR technology in foreign language teaching, particularly in interpreting instruction, demands further exploration. As a significant factor influencing interpreting quality, interpreting anxiety, especially interpreting classroom anxiety, and its manifestations and causes within VR contexts warrant in-depth investigation. This paper aims to address the following three questions:

- 1) How does interpreting anxiety manifest in VR-based interpreting training?
- 2) What are the underlying causes contributing to interpreting anxiety in the VR classroom setting?
- 3) Can VR technology be leveraged to mitigate interpreting classroom anxiety comparing with the traditional interpreting classroom?

Through addressing these questions, we aim to contribute to a better understanding of the relationship between interpreting anxiety and virtual reality technology in the context of foreign language teaching, particularly interpreting education, summarizing the advantages and challenges of combining virtual reality technology and interpretation education.

#### 3.2. Participants

Thirty graduate students from the Foreign Languages College, Inner Mongolia University (IMU), Class of 2023, specializing in English Interpreting, took part in this experiment. They will take a pre-test and post-test interpreting classroom anxiety questionnaire and will be interviewed after participating in the VR classroom

#### 3.3. Context

The experimental group of students utilized the Foreign Languages College of IMU's innovative virtual reality platform, the Kubuqi International Desert Forum Ecological Innovation Interpreting Service Training System, for consecutive interpreting practice as shown in **Figure 1** and **Figure 2**. The control group of students, on the other hand, used the same consecutive interpreting materials



**Figure 1.** Screenshot of Kubuqi international desert forum ecological innovation interpreting service training system.



**Figure 2.** Photo taken in the lab showing the students' operation process.

from the platform but engaged in practice within a traditional interpreting classroom setting. After completing their respective practice sessions, anxiety levels were assessed by the Foreign Language Classroom Anxiety Scale to investigate the varying levels of anxiety experienced in these two different interpreting contexts. Subsequently, interviews (or self-made scale surveys) were conducted with students using the situation system supported by virtual reality technology to explore the sources of interpreting classroom anxiety of students in virtual reality situations.

## 4. Instruments

### 4.1. Interpreting Classroom Anxiety Scale

The ICAS consists of 44 items and was administered to 327 Taiwanese univer-

sity students taking Chinese-English interpreting courses. The scale is based on the design principles of the Foreign Language Classroom Anxiety Scale (FLCAS) and takes the characteristics of listening anxiety and language organization anxiety in the process of interpreting into account, with a standardized design, and the reliability of the questionnaire reaches Cronbach alpha 0.94 after the initial interviews and modified. It has reflected that three factors comprised the ICAS, which are fear of Interpretation class and negative evaluation, cognitive processing anxiety, and low self-confidence in interpretation. This study will also focus on interpreter classroom anxiety factors with the same questionnaire.

## 4.2. Interview for the Participants

The qualitative analysis will also be adopted in this research, so the questionnaire was designed according to the study of anxiety in online interpreting classrooms by Yudi Zheng in 2023 [17] and interview questions prepared by Lin Luan in 2023 on the Effectiveness of Students' Vocabulary Learning in Virtual Reality Environments.

## 4.3. Data Analysis

Thirty students majoring in English interpreting from Inner Mongolia University participated in the study. Before using the training system supported by virtual reality technology, *i.e.*, Kubuqi International Desert Forum Ecological Innovation Interpreting Service Training System, we distributed Chiang's Interpreting Classroom Anxiety Scale to investigate the students' traditional interpreting classroom anxiety and interpreting anxiety in VR learning environment.

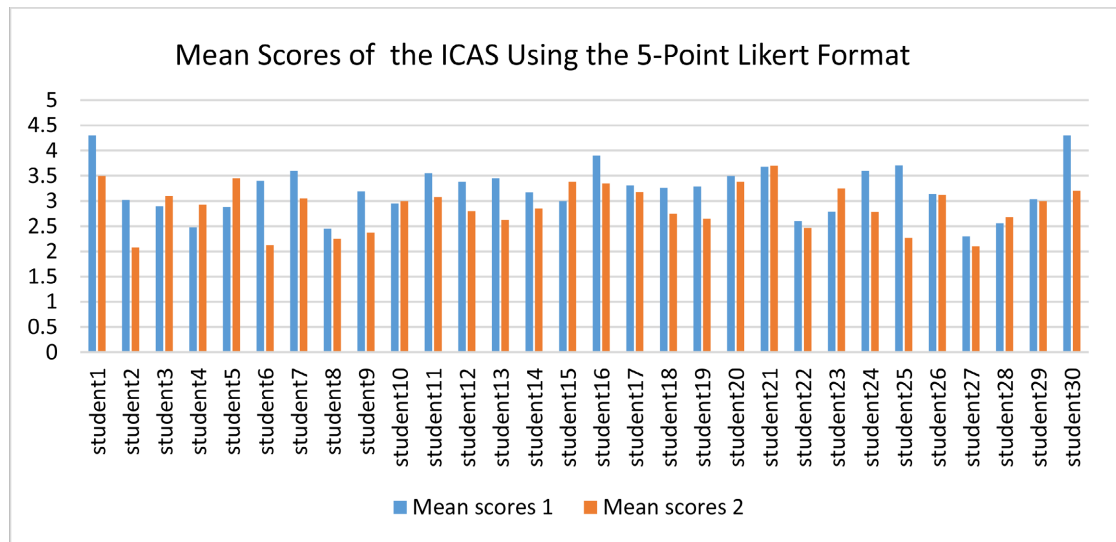
The ICAS is a 44-item inventory using a 5-point Likert-type response format; it yields a composite score with a possible range from 44 to 220. Thirty students' interpreter anxiety scores in traditional interpreting classes ranged from 84 to 181, while mean scores of the ICAS using the 5-Point Likert format can be seen in the follow table. As shown in the **Figure 3**, the mean scores 1 refers to the students' interpreting anxiety degree in the context of traditional interpreting class and the mean scores 2 refers to the students' interpreting anxiety degree in the VR interpreting practice context. In **Table 1**, more specific figures have been shown and the variation between two different situations can be seen through changes in values, and the mean scores 3 refer to the average value of all the students' scores in two situations.

## 5. Results

### 5.1. Quantitative Analysis of ICAS Scale Results

The ICAS scale with the value of 3 as the average, so more than the average value of 3 can be regarded as the existence of moderate or more than moderate interpreting classroom anxiety. In the traditional interpreting classroom, we found that the interpreting classroom anxiety of 30 students was 3.22, which is more





**Figure 3.** Presents the ICAS mean scores for the participants in two situations.

**Table 1.** Presents the specific ICAS mean scores of 30 students and the variation in two situations.

	Mean Scores 1	Mean Scores 2	Variation
Student1	4.3	3.5	-0.8
Student2	3.02	2.075	-0.945
Student3	2.9	3.1	0.2
Student4	2.48	2.925	0.445
Student5	2.88	3.45	0.57
Student6	3.4	2.125	-1.275
Student7	3.6	3.05	-0.55
Student8	2.45	2.25	-0.2
Student9	3.19	2.375	-0.815
Student10	2.95	3	0.05
Student11	3.55	3.08	-0.47
Student12	3.38	2.8	-0.58
Student13	3.45	2.625	-0.825
Student14	3.17	2.85	-0.32
Student15	3	3.38	0.38
Student16	3.9	3.35	-0.55
Student17	3.31	3.18	-0.13
Student18	3.26	2.75	-0.51
Student19	3.29	2.65	-0.64
Student20	3.5	3.38	-0.12
Student21	3.68	3.7	0.02

**Continued**

Student22	2.6	2.47	-0.13
Student23	2.79	3.25	0.46
Student24	3.6	2.78	-0.82
Student25	3.71	2.27	-1.44
Student26	3.14	3.12	-0.02
Student27	2.3	2.1	-0.2
Student28	2.56	2.68	0.12
Student29	3.04	3	-0.04
Student30	4.3	3.2	-1.1
Mean scores 3	3.22	2.88	-0.34

than the average, so we can think that the interpreting students have the phenomenon of interpreting anxiety in the traditional interpreting classroom, and in the virtual reality situation, we found that the average value decreased to 2.88, and 73% of the students' anxiety level scores decreased, so we can judge that the interpreting anxiety of the interpreting students in the VR learning environment has been alleviated. The question "can VR technology be leveraged to mitigate interpreting classroom anxiety comparing with the traditional interpreting classroom" can be answered.

According to the average score of each question, the author compared the scores of the questionnaire answered in two different situations, and the comparison showed that the decrease in anxiety scores for questions 7, 12, 13, 3, 19, 34, and 27 were all greater than or equal to 1 (**Table 2**). The author analyzed the topics that had a decrease of more than 1, and concluded that question 7, question 13, question 3, question 19 are related to the fear of interpretation class and negative evaluation, so we can conclude that the interpreting training in the virtual reality learning environment, due to the autonomy of operation, does not require the teacher to participate in the direct evaluation, and students do not need to be presented in front of the classmates, in the process of interpreting training, the human-computer interaction as the main training method, and the anonymity of training that human-computer interaction enables can alleviate the anxiety of the traditional interpreting classroom.

At the same time, through the results of the scale, we can find that the students' cognitive processing anxiety in the VR environment has also decreased. For example, question 34 deals with the speed of speech, and in the training system supported by VR, students can adjust the speed and volume of the source language for interpreting training according to their own actual situation, thus making the training more personalized, therefore the students' anxiety level has a significant decrease. Then we can know that the operability and interactivity of the training created by the VR can also alleviate students' interpreting anxiety to a certain extent.

**Table 2.** Questions with value changes greater than 1 in two situations.

	Mean Scores in Traditional Interpreting Classroom	Mean Scores in VR Interpreting Training System	Variation in Two Situations
Q7. In interpretation class, I keep thinking that the other students are better at interpreting than I am.	3.46	1.42	-2.04
Q12. In interpretation classes, I can get so nervous that I forget how to interpret things I know.	3.23	1.4	-1.83
Q13. It embarrasses me to volunteer answers in my interpretation class.	3	1.23	-1.77
Q3. I tremble when I know that I am going to be called on in interpretation class.	3.1	1.46	-1.64
Q19. I get anxious when my teacher monitors the accuracy of my interpretation.	3.7	2.12	-1.58
Q34. I feel relaxed even when the English source message is delivered at a fast speed.	3.53	2.07	-1.46
Q27. Taking interpretation class is a very frightening experience.	2.7	1.7	-1

## 5.2. Qualitative Analysis Based on Interview

Of these thirty participants, eight students were more anxious than in the traditional interpreting classroom, so the phenomenon of being more anxious in the virtual reality situation instead cannot be ignored. In order to investigate the causes of student interpreters' interpreting anxiety in virtual reality situations, outline interviews were conducted, which concentrated on the causes of interpreting anxiety and feelings in virtual reality situations.

Qualitative data were collected through focus groups, and the results of the content analysis showed that 48% of the students reported feeling anxious about training in virtual reality situations due to insufficient pre-training preparation. 32% of the students reported that the increased number of elements to focus on in virtual situations caused them stress. For example:

Interviewee A said, "*Unlike the traditional interpreting classroom, in the usual way, the teachers would adjust the preparation time before the interpreting training according to our reactions in the moment, but in the virtual reality training, although we could adjust the speed of the recording, we had no way to prepare at our own pace.*"

Interviewee B said, "*Not only do I need to pay attention to the interpreting training, I also need to go through the steps which can be a bit stressful.*"

For the use of the platform, 42% of the students said that the operation lag caused by the system not being stable and smooth enough would make them anxious. 27% of the students said that the unfamiliarity and lack of proficiency in the operation of the system would make them feel anxious. For example:

Interviewee C said, "*I feel that with this training system, my anxiety may not even come from the interpretation itself, but the lag of this system.*"

Interviewee D said, “*The lagging and recognition errors are particularly difficult for me, and sometimes I need to retrain, which I find troublesome.*”

Interviewee E said, “*The first time I used this system, the steps were a bit cumbersome and I was afraid that I wouldn’t be able to finish, which made me feel nervous.*”

## 6. Conclusions

VR technology can break the role of students as “outsiders” in the classroom under the traditional teaching mode, free students from the fear of the teacher and the classroom, and enhance their motivation to learn. VR technology not only allows students to immerse themselves in the content of the course, but also puts them in a more engaging and realistic learning environment.

This research shows that the environment created by VR can play a role in reducing fear of interpretation class and negative evaluation, cognitive processing anxiety, and improving self-confidence, thus reducing interpreting anxiety, but due to the instability, stuttering, lagging, and other problems of the system, VR technology has also negatively impacted other aspects of interpreter anxiety. This study answers the questions of whether virtual reality technology can alleviate interpreting anxiety, the causes of interpreting anxiety alleviation, and the degree and performance of interpreting anxiety in VR-supported environment, and subsequent studies can focus on how to better use virtual reality technology to promote interpreting training and teaching, and to alleviate the negative impact of interpreting anxiety on interpreting quality.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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