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The Willingness of China University Students towards Virtual Reality Technology in Still Life Sketching

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Abstract

With the emergence of COVID-19 in 2019, virtual reality technology in education has gained new prominence. Numerous specialists anticipate the significant application of the technology in respective fields, most notably in art instruction. This study aimed to determine the extent to which Chinese university students majoring in art and design utilise virtual reality technology as a supplement to traditional classroom instruction. In this study, which was limited to still life sketching, the researcher examined students' readiness to use virtual reality technology. Oculus Quest2 was used as a teaching tool in the classroom. This study's objective was to create the framework for the subsequent research phase. A questionnaire survey was used to obtain data for the investigation. The study population included Chinese university students between 18 and 23. However, a study of 226 first- to third-year university students majoring in art or design was conducted. Tencent distributed the questionnaire via WeChat's mini-program. T-test was used to analyse the data collected. The findings showed most students expressed an interest in participating in virtual reality-based still life drawing classes. It entails advancing art education in China to facilitate future art instruction and learning. The findings can guide stakeholders in considering investments in virtual reality technology for still life sketching.

Keywords: Willingness, China University Students, Virtual Reality Technology, Still Life Sketching

Introduction

In recent years, numerous online courses have gained popularity (Castro & Tumibay, 2021). However, the primary mode of education continues to be the video link (Lemke, 2022; Wong et al., 2022) between teachers and students via cameras (Lange & Costley, 2020; Wong et al., 2022), which has several teaching constraints. Regardless of the subject, many students express dissatisfaction with the paradigm and the resulting learning outcomes. Several Chinese specialists (Shan, 2019; Qiao et al., 2019) have focused on applying virtual reality technology in education and artistic creativity in this context.

Sketching is necessary for studying pure art (Jiang et al., 2020). For these three courses, the typical instructional technique is for students to observe the teacher demonstrate on the spot and then practise independently. The teacher will assist them if they have any questions. While this strategy can considerably enhance professional competency, the process is tedious and monotonous, and students will feel bored after a prolonged time of practice (Alpert & Hodkinson, 2018). Teachers connect kids to speciality courses via the Internet and cameras during the epidemic (King et al., 2019). This teaching technique makes contact with teachers exceedingly inconvenient for students (Shim & Lee, 2020), especially when some abilities or slightly ambiguous concepts are involved, and has a less-than-optimal effect on students' information acquisition. This case thoroughly examined the implementation of virtual reality technology in art and design education.

Virtual reality technology (henceforth, VR), alternatively referred to as virtual environment, spiritual environment, or artificial environment, is the use of computers to create a virtual world capable of directly imposing visual, auditory, and tactile sensations on participants and allowing them to observe and interact interactively (Southgate, 2020). Virtual reality began in 1965 when Ivan Sutherland presented a paper at an IFIP conference titled The Ultimate Display. By proposing that users could utilise the display screen as a window to explore the virtual environment, the paper pioneered a virtual reality study. Ivan Sutherland invented a helmet display and a forward and hand tracker in 1968. Prior to the 1980s, VR technology advanced slowly due to technical constraints. However, until the late 1980s, the rapid development of information processing technology accelerated the advancement of VR technology. In the early 1990s, virtual reality technology had a global boom, and it developed into an independent sector of research and development (Keshner et al., 2019).

The main characteristics of the VR system are the three "I"s: Immersion, Interaction, and Imagination, emphasising the central role of people in the VR system and tailoring the information processing system to their needs and sensory perception. Virtual reality systems can be classified as immersive, non-immersive, distributed, or augmented reality (Southgate, 2020). Virtual reality technology can vividly convey things in three-dimensional space, allowing learners to naturally and directly engage with diverse objects in the virtual environment. Moreover, to engage in the production and transformation of events in a variety of ways in order to maximise control and freedom of operation across the entire environment. This multi-dimensional virtual learning and training environment will give learners the most intuitive and effective method for mastering new knowledge and abilities. It has advantages and characteristics in various educational and training disciplines, including virtual laboratory, three-dimensional concept, ecological teaching, special education, simulation experiment, and professional training. The teaching and experiment effect might result in a result that is twice as effective with half the work.

The purpose of this research is to examine students majoring in art in colleges and universities throughout China's willingness to employ virtual reality technology in the classroom. A review of literature websites reveals an increasing number of papers on the application of this technology in recent years, including those on computer games (Pallavicini et al., 2019), medicine (Silva et al., 2018), architecture (Maghool et al., 2018), and tourism (Beck et al., 2019). However, the article contains a small amount of art and design science. In

this scenario, the research conducted for this essay is critical. The study's scope is confined to still life sketches, and the research approach is for students to view the still life sketches in virtual reality and respond to the questionnaire questions.

Literature Review

Siemens (2004) systematically advances the concept of connectivism and demonstrates that learning is no longer an individual action but rather a process of connecting specialised nodes and information sources. He contends that the interaction of networks, situations and other entities (many external) results in developing a novel notion and method to learning. The application of virtual reality technology is a novel notion and practice. This technology generates a virtual environment where specialised subjects can be studied in-depth. In traditional fundamental art education, we can divide the elements to be learned into three categories: object modelling structure, object proportion and perspective, and the relationship between light and shade (Harrison, 2019), and judge the quality of a sketch on how well these three categories are completed. By incorporating these three points into the VR world to learn specific knowledge points (in this case, a still-life sketch), the relationship between disparate sources of information becomes more precise.

The researcher discovered numerous publications by scanning engineering Village, IEEE, Web of Science, ScienceDirect, and Wiley Online Library, as well as other Chinese academic literature websites and foreign online databases (Duan et al., 2019; Akdere et al., 2021; Marks & Thomas, 2022) Data collection methods, include questionnaire survey, practice, expert interview, and evaluation. As a result of the aforementioned methodologies, this article develops a questionnaire for 150 students majoring in art design in Chinese universities. To ascertain their attitudes regarding VR technology, a questionnaire was developed in accordance with the article *Experiencing Virtual Reality Together: A Case Study of Social VR Use* (Gunkel et al., 2018), and scores were assigned using the Lathe Likert scale, which has five levels.

The Likert System is a widely used additive genus score scale. These things relating to the same construct are evaluated additively, and achieving single or individual items is not rational. It was designed in 1932 based on the original summative scale by Likert, an American social psychologist. The scale is composed of a series of statements, each of which has five possible responses: "strongly agree," "agree," "not necessarily," "disagree," and "strongly disagree," denoted by the numbers 5, 4, 3, 2, and 1. Each respondent's total attitude score is the sum of their responses to each question. This overall score may reflect his attitude toward the scale or his status on the scale.

According to Ojala et al (2022); Behmadi et al (2022); Noble et al (2022); Lin et al (2022), virtual reality exercises offer value to teaching, but they may not fully replace high-quality traditional teaching techniques. As a result, it is critical to understand the distinctions between virtual reality and traditional teaching approaches and how these methods can be combined in the future. Additionally, while VR can significantly improve knowledge in undergraduate emergency medicine students' education, it is not more effective than traditional educational techniques. Additional experimental investigations with a bigger sample size are required to establish that virtual simulation-based education can successfully improve knowledge when teaching practical skills such as triage. Based on these findings, this

study sought to determine the willingness of Chinese university students to use virtual reality technology in still life sketching to go forward with VR technology applications in the future.

Methodology

This study aims to determine the willingness of Chinese college students to use virtual reality technology to study specialised courses through a quantitative research method. The study was conducted in Mianyang, Sichuan Province, China, at a university. It is a comprehensive institution with over twenty faculties, one of which is the College of Fine Arts. The School of Fine Arts offers majors in pure art and art design to all undergraduate students. The college has a total enrollment of around 1300 students. The university was chosen because its students achieve an average to above-average academic performance, a group whose interests are well-represented throughout China.

The sampling technique used in this study is straightforward. Simple random sampling is a sampling strategy in which a researcher employs an already established and desired sample in a study (Gabriel et al., 2019). The study enrolled first- through third-year students in the school's fine arts and design programmes. Prepare to collect and analyse at least 226 questionnaires. Participants will complete a questionnaire indicating their level of interest in using virtual reality for professional studies. Because these kids are skilled with the Internet and many have experience running computer games and a working knowledge of virtual animation, they can quickly grasp the advances that virtual reality technology can bring.

The instruments employed in this study were the students' willingness to use virtual reality technology in still life sketching. The questionnaire's content was adapted from *Experiencing Virtual Reality Together: A Case Study of Social VR Use* (Gunkel et al., 2018), and a comparable scale was employed. Three education professionals verified the course's content and organisation, and its Cronbach's Alpha score is 0.829 and 0.924, which is considered satisfactory (Pallant, 2011). To minimise the impact on students' average learning time, the questionnaire set the response period to one day, from 8 p.m. on March 20, 2022, to 8 p.m. on March 21, 2022; 300 questionnaires will be distributed. We collected a total of 226 valid questionnaires. The questionnaire includes ten questions in length. The application will manage the distribution and recycling of questionnaires via the Tencent questionnaire, and it will compile statistics on the distribution and response to questionnaires. SPSS Version 23.0 software is used to analyse the data once the report is received.

Results

For data analysis, the SPSS Version 23.0 programme is used. The descriptive mean approach determined each item’s mean value and standard deviation. The following are the findings for each item in the questionnaire.

Table 1: Difference in mean scores and SD of the virtual reality technology

Item	Mean	SD
1. How often do you use virtual reality (VR) equipment?	1.72	.993
2. Are you interested in virtual reality (VR)technology?	3.73	.931
3. Are you willing to accept the application of virtual reality technology (VR) in the teaching of art or design?	3.96	.903
4. When it comes to virtual reality (VR), do you think it can be applied to teaching?	3.89	.828
5. Do you feel that experiencing virtual reality (VR) technology is an important thing?	3.87	.869
6. After experiencing virtual reality (VR), are you willing to share it with others?	4.13	.752
7. After learning about virtual reality (VR) technology, do you like it?	3.94	.817
8. Do you think virtual reality (VR) will become a way for universities to teach?	3.91	.812
9. Do you think virtual reality technology will change the way people live, socialize and work?	3.91	.778
10. Do you think virtual reality (VR) technology will have a major impact on art or design majors?	4.03	.771
Overall	3.71	.845

The findings of the t-test on the difference in mean scores and standard deviations for the virtual reality (VR) technology are shown in Table 1. The mean and standard deviation of China university students' willingness of virtual reality (VR) technology used in teaching and learning are (mean = 3.71, SD =.845). This demonstrates that China university students believe virtual reality (VR) technology could be used effectively in teaching and learning of still life sketch. According to Table 1, item 1 (mean = 1.72, SD =.993) was less likely to be used virtual reality (VR) equipment. The item 2 (mean = 3.73, SD =.931) score was higher than the item 1 (mean = 3.73, SD =.931). Thus, the analysis's findings indicate that China university students are more receptive to the application of virtual reality technology. Meanwhile, item 3 (mean = 3.96, SD =.903) demonstrated that university students are receptive to using virtual reality (VR) technology in art or design education. This finding is consistent with items 7 (mean = 3.94, SD =.817), 8 (mean = 3.91, SD =.812), and 9 (mean = 3.91, SD =.778), which demonstrated that China university students are attracted to virtual reality (VR) technology and that it will become a method for universities to teach in order to alter how people live, socialise, and work. Additionally, item 6 (mean = 4.13, SD =.752) had the highest mean and SD in this survey, indicating China university students' willingness to share their virtual reality experience with others (VR). This is followed by item 10 (mean = 4.03, SD =.771), which indicates that virtual reality (VR) technology will significantly impact students majoring in art or design. Following that, item 5 (mean = 3.87, SD =.869) revealed that university students believe experimenting with virtual reality (VR) technology is critical for learning. Item 4 (mean = 3.89, SD =.828) also revealed that university students believe virtual reality (VR) technology can be used for educational purposes.

Overall, the study's findings indicated that China university students agreed and accepted the level of usability and satisfaction associated with the use of virtual reality technology (VR) as a learning medium for still life drawing at China university.

Discussion and Conclusion

In conclusion, the study indicated most of the China university students agreed and accepted the level of usability and satisfaction associated with the use of virtual reality technology as a learning medium for still life drawing at China universities. They had high willingness to learn with VR in their art lessons. To prepare for later research, this study examined the willingness of Chinese university students to embrace the use of virtual reality technology in the teaching of art and design majors in colleges and universities. According to the poll results, approximately 6% of students had never utilised virtual reality technology. Whether or not they have used it, they are incredibly interested in it. A sizable number of students feel that virtual reality technology will impact their major and are willing to accept it as a mode of instruction. Most participants choose to interact with virtual reality technology rather than traditional venues (Ojala et al., 2022; Behmadi et al., 2022; Noble et al., 2022; Lin et al., 2022).

Following the survey, the researcher wants to create customised research assignments and encourage testers to participate. Given that the fundamental disciplines of fine arts and design are sketch and colour, the strategy will concentrate on attempting to create still life sketches in a virtual reality setting. This study aims to contribute to fine arts and design teaching in Chinese universities by demonstrating the influence of digital technology on students' performance and upgrading the traditional learning model.

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