Design of Vocational Education Teaching Resources Based on Polarized 3D Stereo Virtual Reality Technology

Cheng Wang[✉]

Jiangxi Electric Vocational and Technical College, Nanchang 330032, Jiangxi, China
zhc010314@163.com

Abstract. Polarization 3D virtual reality technology can provide real-time three-dimensional virtual environment, so the polarization 3D virtual reality technology in the development and design of teaching resources, can make the role of teaching resources get full play, and can also make learners in the virtual environment, exercise the practical ability of learners. The design of teaching resources based on polarization 3D virtual reality technology will involve tools such as Adobe Flash and Premier, through which the teaching resources can be adjusted accordingly, and the relevant information is captured for them.

Keywords: Polarized 3D Virtual Reality Technology · Adobe Flash · Integrated Interaction

1 Introduction

Virtual reality technology can create a special atmosphere for people through computer technology, so that people can have an immersive sense in the five senses, such as hearing, vision and taste. At present, the research of virtual reality technology has achieved some results, especially in the field of education and teaching [17]. The corresponding analysis of the characteristics and connotation of virtual reality technology can see that the application of virtual reality technology in education and teaching effectively improves the efficiency of teaching, broadens the space of teaching, and makes the overall teaching level of vocational colleges has made great progress.

Combined with the characteristics of virtual reality technology, applying virtual reality technology to distance education can also enable learners and devices to interact and immerse learners in the virtual environment. Perfect teaching resources can meet the students 'interactive learning needs while stimulating the students' interest in learning, and help the learners to realize the analysis and control of the learning status in a visual way [13].

2 Design and Development of Teaching Resources Based on Polarized 3D Stereo Virtual Reality Technology

Relevant analysis and research on virtual reality technology can effectively optimize the environment of training and teaching, and improve the quality and efficiency of training
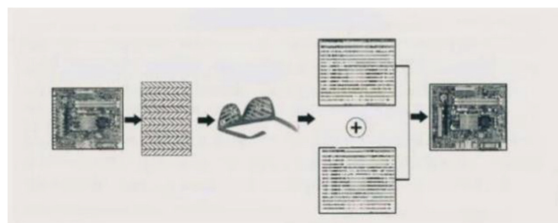
Fig. 1. Principle of polarized 3D stereo imaging

and teaching, make the space of top internship can be further expanded, and also make students to promote the all-round development. In view of the teaching needs and training objectives of various kinds of vocational education, desktop virtual reality technology can be applied to distance education, so that students can interact with equipment, reduce the cost of learning, and effectively stimulate students' creativity and imagination [16]. Excellent teaching resource design is crucial to the optimization and improvement of vocational education and teaching. Only interactive virtual reality technology can meet students' interactive learning needs. Polarization 3D stereo is mainly through the light vibration direction of the original image [10], polarization display will display related images for the viewer, but the use of polarization glasses [3], people will receive two different sets of images, because polarization glasses each lens polarization direction is different, and through the original image, brain synthesis, can present the effect of stereoscopic image [7]. As shown in the Fig. 1.

Through the imaging principle of polarized 3D stereo, the color problem of the glasses can be solved accordingly, and the original color of the image can be restored as much as possible [10]. At present, the polarization display is constantly optimized and improved, and the price of the display is also constantly falling, in terms of the cost, it has been reduced to a certain extent. Moreover [1], because the specific realization effect of polarization 3D stereo vision is greatly related to the three-dimensional resources, and there is no direct connection with the graphics card, so from the technical point of view, the difficulty is also reduced accordingly, so that the technical difficulties of active 3D three-dimensional resource production have been overcome [12]. In order to restore the color of the image, and reduce the cost, and reduce the difficulty, it is necessary to use the polarized 3D stereo virtual reality technology to design and develop the computer teaching resources.

3   Design and Development of Polarized 3D Three-Dimensional Teaching Resources

Because of its flexibility, multimedia courseware has achieved very outstanding teaching effects among many teaching resources, and has the irreplaceable advantages of other teaching resources [6]. The development of the corresponding multimedia courseware based on the polarization type 3D three-dimensional virtual reality technology can effectively improve the quality of the multimedia courseware and make it play a greater teaching role [9].

3.1 Design of Polarized 3D Stereo Teaching Courseware

Courseware design itself is the overall planning of the course content, including both teaching theory and courseware content. Therefore, the courseware design has a certain artistic and scientific requirements, and it must play a certain role in teaching. Therefore, the primary task of the current curriculum development is to carry out the courseware design, and the courseware mainly has two functions, one is demonstration, the other is operation, the courseware design must be carried out around the two functions (Fig. 2).

3.2 Development of Polarized Three-Dimensional 3D Courseware

Both non-interactive and interactive modules are capable of information being captured via a stereo camera or stereo camera, while processing of the captured information by PhotoShop and Premier enables integrated interaction with the help of Adobe Flash (Fig. 3).

The core of the design of polarization 3D stereoscopic teaching resources is interaction process control [14]. First, the screen needs to be divided into two symmetrical pieces, the made stereoscopic images are placed in the symmetrical two screens, and the image position is controlled through code, avoiding the parallax generated by component dragging. When the component moves in space, formulas also need to handle the scaling ratio of the component and the parallax generated by the component drag [4]. In order to create the effect of the screen, the components must be enlarged in negative parallax.

Suppose that the 3D coordinates of the component are, h is the camera-to-screen play, VidiconZ is the Z-axis coordinate of the camera, and the scaling ratio of the projection scale is:

$$Scale = \frac{h}{Math.abs(vidiconZ - z)} \qquad (1)$$

According to the above formula, the coordinates of the components projected on the screen (where N is a constant) can also be obtained:

$$X = \frac{x}{scale} + \frac{N}{scale} \qquad (2)$$

$$Y = \frac{y}{scale} \qquad (3)$$

Through the above formula, it can also be understood that the mouse can obtain the positioning of the left and right area components during the roller operation, and it can also confirm whether the positive and negative parallax is generated.
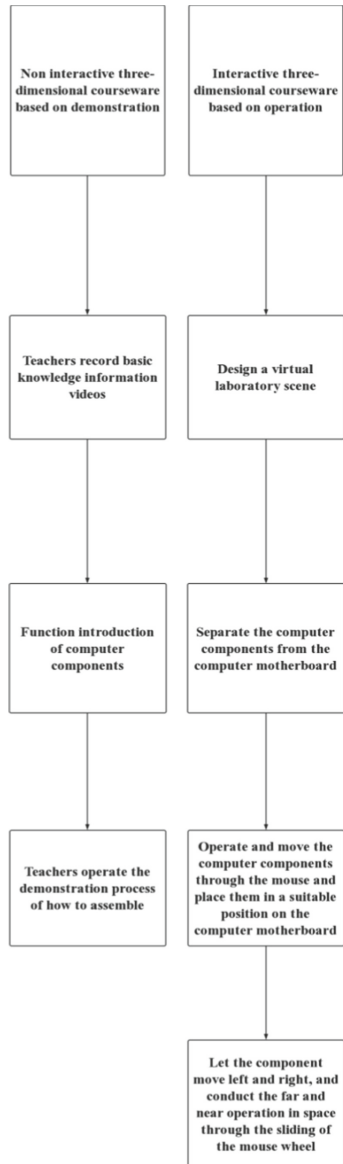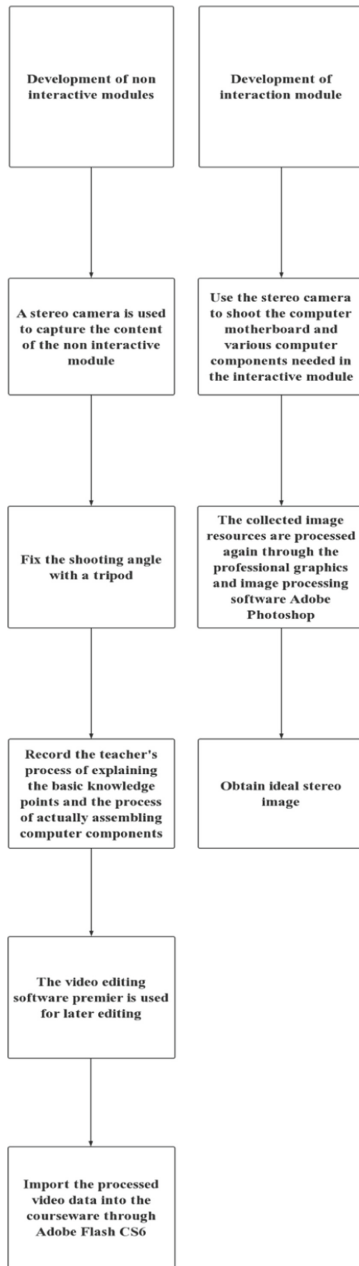
Fig. 2. Courseware design process

Fig. 3. Development of interactive and non-interactive modules

4 Conclusions

The application of the polarized 3D three-dimensional virtual reality technology in the education and teaching can effectively improve the teaching quality and efficiency. However, in the current development and design of the vocational education and teaching resources, the use of the polarized 3D three-dimensional virtual reality technology is still a big challenge. Through the application of polarized 3D virtual reality technology in college education teaching resources, clear the value of polarized 3D virtual reality technology, and want to improve the quality of vocational education teaching, improve the effectiveness of teaching resources, therefore, the effectiveness of polarized 3D virtual reality technology will become the focus of teaching resources development.

References

1. Hanlin, Hu, Liu Geping. 2022. From polymorphic representation to participation: The value path of virtual reality technology in helping subject teaching. *Electrical Education Research* 43(01): 79–85. https://doi.org/10.13811/j.cnki.eer.2022.01.010.
2. Hui, Nie. 2021. Study on the promotion effect of virtual reality on the teaching of drawing composition. *Time Report (Run)* (12): 130–131.
3. Jiehui, Zheng. 2022. Study on classroom student attention detection system for VR education application. *Journal of Xi'an University of Arts and Sciences (Natural Science Edition)* 25 (01): 45–49.
4. Junqiang, Zhao, Xinxin Zhang, Lu Yi, and Fujun Zhou. 2021. Study on the effect of family rehabilitation intervention in children with autism spectrum disorder based on virtual reality technology. *Nursing Research* 35 (23): 4214–4217.
5. Lei, Wu. 2022. An automatic analysis method of animation interactive design integrity based on virtual reality technology. *Automation and Instrumentation* (01): 158–161+167. https://doi.org/10.14016/j.cnki.1001-9227. 2022. 01. 158.
6. Li, Yao. 2021. Application of virtual reality in the course teaching of auditing in the background of new liberal arts. *Quality and Market* (24): 91–93.
7. Lin, Pu, and Ruiyang Yan Tong. 2022. On the difficulties and prospect of virtual reality technology in museum contextual design. *Journal of Xi'an University of Arts and Sciences (Natural Science Edition)* 25 (01): 56–63 + 69.
8. Mei, Fan, Baoqing Jiang. 2021. Design and practice of red culture education cloud platform based on virtual reality technology —— takes Sichuan red culture resources as an example. *Technological Innovation and Application* 11(36): 1–5. https://doi.org/10.19981/j.CN23-1581/G3.2021.36.001.
9. Qian, Wu. 2022. Takes the study of Qiannan normal university for nationalities as an example. *Technology and Innovation* (02): 164–167. https://doi.org/10.15913/j.cnki.kjycx.2022.02.048.
10. Rubing, Xue. 2022. The exploration and application of "virtual reality combination" —— virtual reality technology in animation design teaching. *Fine Arts Education Research* (01): 139–141.
11. Shoubin, Song. 2021. Exploration and practice of curriculum teaching mode reform of NX 3D mechanical design under modern information technology. *Time Automobile* (09): 57–58.
12. Shuai, Hao. 2021. Research on remote operation and maintenance system based on virtual reality technology. *Modern Manufacturing Technology & Equipment* 57(12): 16–18+23. https://doi.org/10.16107/j.cnki.mmte.2021.0913.

13. Shuzhen, Wu. 2021. Optimization design of teaching resource management system in applied universities under the background of intelligent education. *Information and Computer (Theory Edition)* 33 (08): 233–235.
14. Wanhua, Zhao. 2021. Research on integration optimization strategy of virtual reality technology and ideological and political courses. *Science and Education Guide* (35): 101–103+113. https://doi.org/10.16400/j.cnki.kjdk. 2021.35.033.
15. Xiaoyi, Li, Tianlun Li, and Li Zhe. Virtual reality technology was applied to the visual analysis of the recent decade of research in the field of stroke rehabilitation. *Neural Injury and Functional Reconstruction* 1–5. [2022-02-24]. https://doi.org/10.16780/j.cnki.sjssgncj.20210763.
16. Yannan, Zha. 2022. The innovation and practice of virtual reality frontier technology in youth popular science popularization education. *Office Automation* 27 (02): 30–32
17. Ye, Sun, Pengxu Chen, and Du Mei. 2022. Application of "virtual reality technology" in environmental art and design under the background of "integration of industry and education". *Modern Vocational Education* (07): 85–87.
18. Youxie, Ye. 2021. Design and application of virtual reality technology in the teaching of experimental chemistry in middle school. *Intelligence* (36): 115–117.