Application of virtual reality technology in 3D animation course teaching

Yuhui Chen

Jiangxi Environmental Engineering Vocational College, Ganzhou 341000,China

Abstract: The rise of virtual reality technology has brought revolutionary changes to the field of education, and its application has deeply affected all kinds of education fields. In this paper, we will explore the application of virtual reality technology in 3D animation course teaching, aiming to explore how to give full play to the potential of this advanced technology to improve the quality of 3D animation course education and students' learning experience. This paper will deeply discuss the potential of virtual reality technology in 3D animation education from three aspects of application value, characteristics and application strategies, so as to provide useful thinking and guidance for educators and researchers.

Key words: Virtual reality technology; 3D animation course; Teaching; application

I. The application value of virtual reality technology in 3D animation course teaching

In today's digital age, virtual reality technology, with its powerful immersive experience and interactive nature, has brought earth-shaking changes to various industries. As a 3D animation course teacher, I know how to skillfully integrate virtual reality technology, which will provide students with a richer and deeper learning experience. The following is a detailed discussion of the application value of virtual reality technology in the teaching of 3D animation course. Simulate the real production environment. Virtual reality technology offers students the possibility to simulate a real production environment. Through the virtual reality headset, students can feel the atmosphere of the 3D animation production scene, including the lights, sounds and even the air flow of the studio. This immersive experience helps students better understand all aspects of 3D animation production and improve their adaptability in actual production; Creative divergence and spatial perception. The application of virtual reality technology in 3D animation courses can stimulate students' creativity. Through the virtual reality environment, students can freely roam in the virtual world, observe and experience different scenes. This creative divergent learning mode helps to expand students' thinking boundaries and enhance the uniqueness of their animation creation. At the same time, virtual reality technology can enhance students' perception of space and make them more sensitive to understand and use the expression of three-dimensional space in animation. Real-time feedback and interactivity. In 3D animation production, real-time feedback is essential for student learning. Virtual reality technology can provide real-time visual and auditory feedback, enabling students to adjust their creations in real time. Through the virtual reality headset, students can immerse themselves in the scenes they create and feel the actual effects, thus better understanding how the animation is presented. In addition, virtual reality technology can also increase the interactivity among students, prompting them to communicate and collaborate better in teamwork; And expand animation production techniques. Virtual reality technology provides students with more tools and techniques for animation production. Through the virtual reality platform, students can use gestures, controllers and other ways to directly control the elements of the virtual scene, this intuitive operation mode helps students to master the technical points of animation production more quickly. At the same time, virtual reality technology can also simulate different production software interfaces, so that students can more comprehensively understand and master the three-dimensional animation production software commonly used in the industry.

II. The characteristics of 3D animation combined with virtual reality technology

Virtual reality technology is an interactive digital environment based on computer simulation technology, which can realize immersive interactive behavior with virtual environment. In the teaching of 3D animation course, the combination of virtual reality technology and 3D animation can bring the following characteristics. First, virtual reality technology can provide an immersive learning experience. Traditional 3D animation courses typically present the work through a two-dimensional screen, with students only able to view it from an "outside" perspective. With virtual reality, students can wear devices such as head-mounted displays to further immerse themselves in 3D animation scenes. They can observe, feel and operate from their own perspective to get a more real and intuitive learning experience. For example, in the process of learning character animation, students can observe and simulate the actions of characters from their own perspective through virtual reality equipment, and have a deeper understanding of animation principles and techniques. Secondly, virtual reality technology can provide an interactive learning environment. Traditional 3D animation courses usually focus on teachers' explanation and students' watching, and students lack opportunities to actively participate. Virtual reality technology can break this passivity and provide an interactive learning environment. Students can explore, create and adjust independently by interacting with three-dimensional animations in virtual scenes through devices such as joysticks and joysticks. This participatory learning method can stimulate students' learning interest and creativity, and promote their understanding and application of 3D animation technology. Thirdly, virtual reality technology can provide practical learning opportunities. In traditional 3D animation courses, students have limited access to resources and opportunities in practice. Virtual reality technology can create a variety of virtual scenes and characters, providing students with more practical learning opportunities. For example, in the process of learning role modeling, students can personally operate modeling software in the virtual

environment through virtual reality equipment, observe and adjust the details of the model in real time, so as to improve their technical level and modeling ability. Finally, virtual reality technology can also provide feedback and evaluation mechanisms. In a traditional 3D animation course, students usually only get an idea of how well they are learning through the teacher's assessment. Virtual reality can use technology such as sensors and algorithms to monitor students' performance in a virtual environment in real time and provide immediate feedback and assessment. Through the interface and guidance on the virtual device, students can understand their shortcomings and make corrections and improvements in time. This personalized learning feedback mechanism can help students better master the 3D animation technology and improve the learning effect and results.

III. The application strategy of virtual reality technology in 3D animation course teaching

1. Technology construction

(1)PC development environment

In 3D animation courses, students will usually need to use professional 3D modeling and animation software such as Maya, 3ds Max, Blender, etc. In order to realize the application of virtual reality technology, the first task is to ensure that the development environment of the PC meets the dual requirements of 3D animation software and virtual reality technology. High performance hardware. A PC should be equipped with a high-performance CPU, GPU, and memory to handle the complex rendering and simulation of 3D scenes while ensuring the smoothness of virtual reality applications. Professional software support. Install and configure 3D animation software for students to model, animate, and render. These software often require specialized setup and optimization to accommodate the integration of virtual reality technology. Virtual reality device drivers. Install and configure drivers for your virtual reality device to ensure that the device can connect and interact seamlessly with your PC.

(2) Support of 3D scene editing technology

In virtual reality, the creation and editing of 3D scenes are crucial. Students need to learn how to build virtual scenes and combine them with 3D animated content. The following are technical strategies for supporting 3D scene editing: Virtual scene editing software. Provide students with virtual scene editing software, such as Unity3D or Unreal Engine. These software can be used to create, edit, and manage virtual scenes and integrate 3D animated content. 3. 3D model import. Make sure students can easily import the models and animations they create in 3D animation software for use in virtual scenes. Interactive elements added. Teach students how to add interactive elements such as buttons, interactive objects, etc. to a virtual scene to provide a richer learning experience.

(3) Virtual learning environment integration technology

In order to realize the effective application of virtual reality technology in 3D animation courses, it is necessary to integrate virtual learning environment and teaching content closely. Here are some key technical strategies: Interactive course design: Develop a virtual learning environment that is consistent with the content of 3D animation courses. This requires the technical team and the teacher to work closely together to ensure that the interactive elements in the virtual scenes are aligned with the teaching objectives. User interface design: Design user-friendly virtual reality user interfaces to enable students to easily navigate virtual environments, view course materials and interact. Data acquisition and Analysis: Implement data acquisition of students' learning behaviors to understand how they perform in a virtual environment. This can be used to improve instructional content and provide personalized feedback.

2. Subjective construction of teaching design

The subjective construction of instructional design is to achieve the teaching purpose, promote students to acquire professional knowledge and skills in 3D animation courses, and improve their animation creation ability and application ability. In the application of virtual reality technology, instructional design needs to combine the characteristics of 3D animation course and use the characteristics of virtual reality technology to provide more specific and practical teaching experience. First of all, in terms of the purpose of teaching design, the knowledge and skills of 3D animation course should be the goal, and more intuitive and immersive learning experience should be provided through the application of virtual reality technology, so that students can deeply understand the principles and skills of 3D animation production. For example, through the use of virtual reality helmet and handle and other equipment, students can simulate the real creative environment, personally experience the process of model modeling, animation drawing and special effect production, and better grasp the production process and technical points of 3D animation. Secondly, in terms of the "dual master" teaching mode of teaching design, students should be placed in the main position to give play to their initiative and creativity. Through the application of virtual reality technology, students can be provided with a participatory learning environment, stimulate their interest and motivation, and encourage them to actively participate in the creation of three-dimensional animation. For example, by using the interactive function of virtual reality technology, students can independently choose and operate characters, scenes, props and other elements, creatively build and preview animation effects in real time, and cultivate their creative expression and aesthetic ability. Thirdly, in terms of the objectivity of the teaching process, the use of virtual reality technology can provide real and accurate feedback information to help students correct mistakes and improve their works in time. Through the simulation effect and real-time feedback function of virtual reality technology, students can intuitively feel the effect of animation production, and timely adjust and correct the mistakes and deficiencies in the works. For example, students can use virtual reality technology to observe the fluency of characters' movements and the fidelity of scenes in real time, make adjustments and optimizations, and improve the quality and expressiveness of the works. Finally, in terms of the real-time feedback of teaching evaluation, the application of virtual reality technology can provide timely and accurate evaluation, and give students specific guidance and suggestions. Through the data analysis and evaluation function of virtual reality technology, teachers can quickly understand

the animation creation level and problems of students, and timely give targeted evaluation and guidance. For example, teachers can analyze students' animation timelines and characters' expressions and actions, evaluate their animation techniques and creative ability, and provide improvement plans and suggestions to help students further improve.

3. Student-centered instructional design based on virtual technology

In the teaching of 3D animation courses, it is crucial to establish a "student-centered" instructional design, especially under the application of virtual reality technology. This design should fully combine the characteristics of 3D animation course and make full use of the characteristics of virtual reality technology to provide a more interactive, autonomous and stimulating learning experience. First of all, in the introduction of teaching, fascinating virtual scenes and storylines should be designed to introduce students into the world of 3D animation. Through virtual reality technology, students can feel the wonders of the virtual world personally and stimulate their curiosity and interest in learning. For example, at the beginning of the course, through virtual reality headsets, students can immerse themselves in a beautiful virtual forest with various fantasy creatures and landscapes. This engaging introduction session can attract students' attention, make them interested in 3D animation lessons, and increase their motivation. Secondly, in terms of autonomous learning stimulated by virtual learning environment, virtual reality technology provides more opportunities for students to learn independently. In a virtual environment, students can independently choose the direction, depth and speed of their exploration. They can experiment, create and learn by autonomously manipulating virtual objects, scene elements and characters through the interactive functions of virtual reality technology. This feature of autonomous learning helps cultivate students' creativity and problem-solving skills. For example, students can make their own three-dimensional models through virtual reality technology, adjust materials, lighting and animation effects, experience their own creative process, and constantly improve and perfect. Finally, in terms of interactive experience in virtual teaching, virtual reality technology can provide a highly interactive learning environment. Students can interact with elements in the virtual world to simulate real situations and enhance their learning experience. For example, in teaching, students can use virtual reality headsets and joysticks to interact with virtual characters, touch, move and change the characters' movements, expressions and environment, and feel real-time feedback and interactive experiences. This interactivity not only makes learning more interesting, but also deepens students' understanding and memory of the course content.

Conclusion: Through the in-depth discussion on the application of virtual reality technology in 3D animation course teaching, we not only emphasize the application value of this technology, but also highlight the unique characteristics of the combination of 3D animation and virtual reality technology. At the same time, we also put forward the corresponding application strategy, including the technology construction, the subjective construction of teaching design and the "student" as the center of teaching design. These strategies are expected to create a richer, interactive and immersive learning experience in 3D animation courses, stimulating students' creativity and motivation to learn. Virtual reality technology has brought new possibilities for 3D animation education, and we look forward to seeing more innovative applications of virtual reality technology in education in the future, so as to continuously improve the quality of education and cultivate more creative 3D animation artists.

References:

[1] Linyu Gu. Research on Teaching Design of 3D Animation Course based on Virtual Reality Technology [J]. Computer Knowledge and Technology,202,18(32):131-133.

[2] Jiaming Yang. Research on the Application of Virtual Reality Technology in the teaching of 3D Animation Course [J]. Chinese media technology, 2020 (8) : 106-108. The DOI: 10.19483 / j.carol carroll nki. 11-4653 / n. 2020.08.027.

[3] Wei Wu,Yin Sun. Research on 3D Animation Design and Virtual Reality Combined teaching [J]. Southern Agricultural Machinery,2019,50(07):165+168. (in Chinese)

[4] Jingjing Liu,Yingjie Li. Exploration and Research of Quality Courses based on Virtual Reality Technology -- A case study of 3D Animation Technology course [J]. Fujian Computer,2017,33(05):71-72.