

Design and Implementation of a Vr Display and Interaction Teaching System

Jiayu Xia

Officers College of Pap, Chengdu, Sichuan, China

Keywords: Vr display and interaction, Teaching system, Design and implementation

Abstract: This article designs and develops a teaching system based on VR display and interaction, and uses the teaching of “History of Film” as an example to design and implement. The real-time three-dimensional spatial expression capability and human-computer interaction operating environment in VR technology provide a new solution for improving the existing classroom theory teaching mode. This teaching mode evokes the initiative of students with visualized teaching content and game-like learning methods. Students can find points of interest, expand their knowledge from points and faces, and achieve “education and fun” through real-time interactive course space.

1. Introduction

In recent years, with the development of information technology, people have increasingly recognized the deficiencies of traditional teaching models. Using modern technology and improving teaching models has become an inevitable stage of China's education reform. For this reason, people in the education field have made some discussions and attempts on teaching models, such as popular multimedia teaching, using multimedia courseware and projection to teach students; or improving teaching content, summarizing the content into a complete system and focusing on Teaching, etc. But in essence, it still cannot be separated from the teacher-centered teaching model. These new teaching explorations are conducive to the leading role of teachers and make it easier for teachers to control, manage and organize classroom teaching. But it also has shortcomings. The students' creativity and initiative have not played well, and they cannot reflect the students' subjective cognitive function well. In the final analysis, the lack of interactive curriculum education still belongs to the traditional indoctrination education model. The reform of the teaching model in many schools seems to have entered a misunderstanding: modern scientific and technological education methods plus traditional teaching models are the new teaching models. For example, simply use multimedia courseware in the classroom. Although these courseware has increased the amount of lectures and improved the students' interest in learning, they have not fundamentally reformed the inculcated teaching model. They have not really cultivated the students' initiative and students are still passive. It is not difficult to imagine that if students, as cognitive subjects, are always in a passive position throughout the teaching process, it is difficult to achieve ideal teaching effects, and it is even more unsuitable to cultivate creative talents. Therefore, the reform of the urgent teaching model should be to improve the interactivity of the classroom, stimulate the students' interest in learning, and make the students the subject of learning. As a form of entertainment and leisure, games often occupy the opposite position to education. Throughout the ages, learning is based on the premise of staying away from games, which makes many people who are addicted to games lack interest in learning knowledge. The game has the characteristics of freedom, openness, joy, enthusiasm, creativity, and interactivity. Such characteristics make the game full of charm and attract people to relax and even indulge. American scholar James Hans has pointed out that games are creating meaning, a way to explain and operate a “given” world, and a way to constantly adapt and manipulate rules; knowledge is not something “external” that people need to grasp. It is the product of action in the game. Therefore, whether the characteristics of games can be applied to education and create a game-like education to attract students' interest, awaken interactive learning and get rid of the indoctrination education model has become the research goal of the dissertation.

2. Overall Design of the Teaching System of the History of Virtual Reality Movies

Compared with the traditional teaching method for teachers and students, the teaching system has the following characteristics:

Visualization: the text is compressed in content and the proportion of pictures is increased, video clips that cannot be done in textbooks are added, and the order of film history development is used as a visit order for exhibition hall design to make students understand the history of film implicitly Development path. The arrangement of the exhibition hall is divided into two different styles, including several small styles, to reflect the major turning point in the development of film history. **Interactivity:** Students participate in the virtual system from a first-person perspective. In the virtual teaching system, they can get rid of the rhythm of the teacher's lectures, find their own points of interest, stay in-depth to learn more, have stronger autonomy and initiative, and inspire Students want to learn to see passion. **Dissemination:** The program can not only provide professional student learning, but also disseminate through the Internet, providing downloads for more interested people. Students' learning is no longer confined to the classroom. At home, ordinary leisure time can be turned out to continue studying. **Teach students according to their aptitude:** Although still under the same syllabus, students have the right to take the initiative. You can find different entry points as your own understanding of the research content, no longer carried away by the fixed focus of the tutorial, and have your own new thinking and ideas.

3. Technical Architecture Design of Film History Teaching System

The film history teaching system is a virtual reality teaching system based on VR technology and applied on multiple platforms. Therefore, in building the technical architecture of this teaching system, five softwares were mainly selected, namely Autodesk Maya, Adobe Photoshop, Final Cut Pro, Adobe Premiere, and Unity3D. Adobe Photoshop, referred to as “PS” for short, is one of the world's most famous and widely used flat image processing software launched by Adobe Corporation in the United States. It has extraordinary ability to modify, edit, process and produce images, and is an indispensable and important tool in advertising production and image modification and editing. Final Cut Pro is a very powerful video editing software from Apple. It can perform high-level editing and processing of video, sound, pictures, and text, and can generate video or audio files in different formats. It has high flexibility and provides powerful functions. In combination with the hardware of the Mac, it has the advantages of fast speed, high efficiency, and stable system operation in non-linear production. Autodesk Maya is the world's top 3D animation software produced by the American company Autodesk. The application objects are professional film and television advertising, character animation, and movie special effects. Maya has perfect functions, flexible work, easy to learn and use, extremely high production efficiency, and strong realism in rendering. It is a high-end production software at the film level. Adobe Premiere is a popular video editing software from Adobe. It has good compatibility and can work with other software from Adobe. Currently this software is widely used in advertising production and TV program production. Unity3D is a multi-platform comprehensive game development tool developed by Unity Technologies to create interactive content such as 3D video games, architectural visualization, and real-time 3D animation. It is a fully integrated professional game engine. Publish games to Windows, Mac, Wii, iPhone, and Android platforms. You can also use the Unity web player plugin to publish web games and support web browsing on Mac and Windows. Its web player is also supported by Mac widgets.

4. Realization of Vr-Based Teaching System

In this exhibition system, users visit the exhibition from a first-person perspective: WASD or the up, down, left, and right arrow keys can manipulate the character to move up, down, left and right. The space bar controls the jump. The movement of the mouse controls the vertical, horizontal, and leftward rotation of the eyes of the character's head to simulate the effect of a real person turning his

head to observe the surrounding environment. These human-computer interaction effects can all be achieved with scripts and code in Unity3D. One of the most powerful aspects of Unity3D is that it integrates scripts and related functions into the editor, which can quickly and intuitively connect and manipulate any game object in the scene. There are three scripting languages supported by Unity3D: JavaScript, C#, and Python, a dialect named Boo. All three languages have access to the underlying .NET libraries. And the same object allows scripts in three languages to execute at the same time. Because Unity3D's implementation of JavaScript is actually compiled into native machine code using JIT, the three languages have the same runtime speed in Unity3D. But at the same time Unity3D has some built-in resource packs, including skybox, personal controller, terrain, water and other very useful and convenient resources. This system uses a personal controller resource package to make a first-person controller. Select Assets-Import Package-Character Controller in the menu bar, and Unity3D will import the personal controller resource package into the project project folder. At the same time, the Character Controllers folder appears in the Standard Assets directory on the right project bar. It contains a 3rd Person Controller prefab file, a First Person Controller prefab file, and a Sources folder. Figure 4-2 shows the third person controller and the first person controller. In Unity3D's third-person controller, the camera perspective is set behind the character, and the default role is a plumber. In the first-person controller, the camera angle is set on the eyes of the person, and the rotation of the lens is controlled by sliding the mouse. The way Unity3D adds components to the scene is very simple and convenient, just click and select the object you want to add and drag it into the window to the target position. And if there is terrain or surface, the axis of the object will be automatically adsorbed on the target surface, which is the same height as the surface. (Note: The default first-person controller's pivot point is at the center of the controller, so when it is the same height as the surface, half of the controllers are usually above the surface and half of the controllers are below the surface. It falls down under the physical effect, so you need to manually adjust the object up to be above the surface.) The first-person controller comes with a main-view camera, and we can adjust the height of this camera independently according to demand.

The export release in Unity does not create a large version containing all the project files, it will require choosing which scenes to include, so as to export only the resources needed for the corresponding scenes, saving unnecessary space. So before creating a version, you need to choose which scenes need to be exported. Export settings can be opened in File-Build Settings. Clicking Add Current will add the scene being opened to Scenes in Build and give it a numerical index on the right, starting at 0. The scene with index 0 will default to the original scene. Here the initial scene a is added as the first scene, then when the user opens the system, the initial scene will be entered by default. It is the export setting window. You can select the exported version in Build Settings, here Windows is used as an example: Click Player Settings to select more options. The name in the Company Name will be used by the program installation to save the Preferences file; the name in the Product Name is the name of the program and will appear in the menu bar and the Install folder; the Default Icon is the icon displayed by the program, and the design of the icon here needs attention. Note that the thickness of the line will be different after the icon is scaled down, so the use of the line is mostly expressed by the width of the surface. Use transition colors with caution in icon design. One to three colors are more suitable for icon design. The icon focuses on generalization and trimming, and it is advisable to keep it simple and standardized. There is no need to make the icon in ICO format in Unity, either JPG or PNG image format. But before selecting the icon, you also need to put the picture in the Assets folder to be included in the selection.

5. Conclusion

The introduction of VR technology in education is an important development trend. This article uses the history of film courses as an example to make a film history teaching system. This system is different from the teaching methods of history courses and operational courses in most universities today. With the exhibition visit mode and virtual reality participation method, it provides students with a realistic, vivid and novel learning environment, allowing students to freely

explore teaching content in a virtual exhibition hall, and experience surreal scenes that cannot be achieved in real life. Greatly mobilized students' interest in learning. And its computer-based communication method can be transmitted and downloaded on the Internet, bringing learning out of the classroom, and the learning progress is completely controlled by itself. This article starts with a study of the current teaching model, analyzes and summarizes the development of VR technology in the teaching field at home and abroad, elaborates the research purpose and main content of the paper, and summarizes the organization and arrangement of the paper content.

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