Application of Game Program in Virtual Teaching Environment of Cultural Courses in Higher Vocational Colleges --Take the teaching content of Liangping New Year Pictures as an Example

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Abstract. With the diversified development of network teaching in modern higher vocational education, the importance of network virtual teaching environment for the success rate of traditional culture course teaching is increasingly apparent, which has also attracted great attention from academia and industry. However, at present, limited by many factors, such as serious network teaching mode, low interest of learners, low professional relevance and so on, the problem of low success rate of network virtual teaching environment-assisted teaching is more prominent. Firstly, based on the background of modern digital age, this paper makes a wide search and collation of related theories. On this basis, taking the improvement of the teaching content of Liang Ping's New Year Pictures as a case, this paper studies the application of teaching games in traditional culture courses by using the methods of practical investigation, empirical research and functional analysis. The research shows that the optimization of teaching methods can better realize the teaching auxiliary function of network virtual teaching environment, help to improve the cultural quality of learners in higher vocational colleges in China and promote the goal of cultural inheritance and development. However, the all-round popularization of cultural inheritance and development of higher vocational college students needs further scientific and technological development and continuous improvement of teaching resources.

Keywords: Traditional culture courses, Teaching game program, Teaching achievement rate.

1 Introduction

In the digital age, higher vocational education focuses on developing online and offline mixed education, and diversified online assistance has increasingly becoming an important means to improve teaching efficiency. The speed of network development has also makes more possibilities become a reality. Digital China Development Report (2022) shows that by the end of 2022, the number of 5 g base stations in China will reach 2.312 million, accounting for more than 60% of the global total. Traditional culture course in higher vocational colleges is a literacy course with the core of inheriting and carrying forward traditional culture and the purpose of cultivating learners' interest and hobbies in traditional culture. It helps learners understand the origin, development and influence of China culture by systematically introducing China's excellent traditional culture, and enhances learners' self-confidence and recognition of national

culture. However, as a general course, this kind of course is often ignored by learners, and most of these online teaching courses are not helpful to improve the teaching achievement rate because of many factors such as serious online teaching mode, low interest of learners and low professional relevance. Making use of unreal engine (UE) to make teaching game programs and replacing traditional theoretical knowledge with gamified plots can enhance learners' interest in learning cultural lessons, thus contributing to the improvement of teaching achievement rate. Taking the teaching content of Liang Ping's New Year pictures as an example, this paper expounds the application ideas of game programs in virtual teaching environment, thus forming the application paradigm of this type of courses and providing new help for the inheritance and development of traditional culture.

2 Status Analysis

In higher vocational education, online teaching for learners has become a new teaching assistant, and online courses or recorded courses are used to assist teaching.(As shown in **Table 1.**), the interest in different types of courses was investigated through questionnaires. In the learning process, students are more interested in practical technical courses. The higher the proportion of theoretical content, the higher the proportion of learners who are not interested, which reflects that learners are very selective in actual learning. Compared with professional courses, the task of finishing such courses is also easier. Learners generally regard traditional culture as a supplementary course, which is difficult to achieve the goal of assisting in improving the teaching achievement rate. Therefore, connecting science and technology, cultural space and social production based on virtual cultural space is a spatial expression based on cultural resources and supported by science and technology, and virtual space is a field.[1]Referring to the existing virtual cultural spaces in foreign countries, such as digital museums,[2] digital libraries,[3] digital archives,[4] digital science and technology museums and online games,[5] errichello and others believe that the unique space created by virtual reality technology can obviously enhance the tourism experience of museum visitors.[6] It is very necessary to develop a game application that can match online teaching as a teaching assistant application.

Table 1. Higher Vocational Students' Interest in Courses.

Degree \ Type	Theoretical courses	Practical courses	Theoretical and practical courses
Have interest in	22%	73%	57%
Have a little interest	37%	26%	41%
Have no interest	41%	1%	2%

3 Technical Characteristics

Virtual teaching environment is an Internet-based learning platform, which can display course resources, activities and interactions and evaluate them at different stages. Modern online teaching platforms are basically made under this concept, such as Tencent QQ, Chaoxing learning link, Dingtalk and so on. As the promotion of modern diversified network teaching, the methods and means of virtual network teaching environment are constantly improved and

integrated into virtual reality, mobile interaction, interesting and vivid pictures, etc. There are many such game learning platforms abroad, such as: language learning platform "Duolingo", mathematics game "Math Land" and programming class "Code Combat".

Unreal Engine is a game development engine launched by Epic Games. The picture performance of UE 4 is excellent, and it can simulate the texture of the real world very truly.[7] The real-time rendering optimization of UE 4 engine can show the virtual venues more realistically. [8]When making a teaching program, the UI interface includes a start interface, a loading interface and a grade selection interface. Add buttons at the corresponding interface position, and use the on-pressed event to trigger the level switch function.[9] On the basis of the original teaching content, enrich the visual experience, enhance the interactive experience and enrich teaching methods.

4 Teaching Design

The online content scheme is based on the content of cultural course, and the Liangping New Year Pictures, a special project of Chongqing intangible cultural heritage, is selected as an example. As the abstract technical and cultural content of the course content, it is difficult for learners to fully understand the language and video because of its complicated production process and many operations in the production process are related to culture in various ways. It needs to cooperate with the program functions such as virtual operation, virtual interaction and virtual sense of space, so as to better improve the teaching achievement rate. **Table 2.** shows the teaching sections of the teaching content of Liang Ping's New Year pictures, as well as the interactive ways designed in each section, which can enhance the teaching understanding.

Table 2. Application Framework of Traditional Culture Courses (Liang Ping's New Year Picture Teaching).

Section 1	The Historical and Cultural Background	content of courses	Origin, Development, Cultural background	Status and Influence	Connotation of folk culture,Characteristics of folk art
		Learning style	V.P.I	V.P.I	V.P.O
Section 2	Artistic Characteristics and Value	content of courses	Artistic characteristics,Types of forms	Unique value, Contribution	Yearning for a better life
		Learning style	V.P.I	V.P.O	V.P.I
Section 3	Inheritance and Innovation	content of courses	Development situation	Traditional characteristics, Innovation and Development	Inheriting consciousness
		Learning style	V.P.I	V.P.O	V.P.I
Section 4	Social and Cultural Development	content of courses	Promote cultural development and exchange	Local characteristics and functions	Positive effect
		Learning style	V.P.I	V.P.O	V.P.I
Section 5	Practice and creation	content of courses	Experience craft, Artistic charm	Cultural perception,Cultural self-confidence	Innovative thinking, Personalization
		Learning style	V.P.O	V.P.O	V.P.O

Sect ion 6	Evaluation and reflection	content of courses	Evaluation of process and practice	Reflect on the shortcomings	Evaluate each other , Deepen understanding
		Learning style	V.P.O	V.P.O	V.P.O
Interactive learning mode V: VR spatial interaction P: video and picture I: content investigation O: professional operation					

5 Interactive Design

5.1 Virtual Action Trigger

The teaching of traditional culture courses often needs to use a large number of pictures and video materials to explain cultural development, environment, region, technological process, etc. It is difficult for learners to stay focused for a long time with a single large number of documentaries, and online materials are often ignored in the background. Therefore, in the teaching program design of Liang Ping's New Year pictures, Liang Ping's real scene and virtual scene are widely used for switching. Through plot clues, knowledge points related to the course content are triggered in the scene, and related pictures or video materials will be played after the event is triggered （**Fig.1.**Trigger quest video.), thus deepening the cognition of the content and solve the serious problem of patterning.
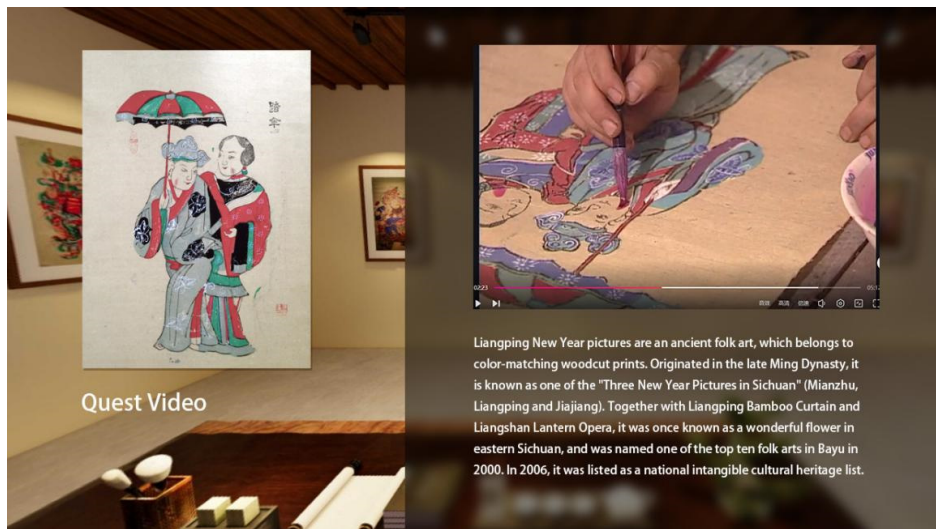

Fig.1. Trigger quest video

5.2 Virtual Process Operation

In the modern digital era, there are many ways of interaction, and the technical process in teaching is the most abstract. It is often watched through video, and there is not much feelings. By collecting teaching materials, the process, tools, knife marks and colors of Liang Ping's New Year pictures are sampled, and the interactive process flow is simulated in the operation program (**Fig.2.**simulates interactive production of color printing plates.), and the consequences caused

by some wrong operations are added appropriately. Through virtual simulation, learners can practice in a safe environment, and avoid the waste and damage of actual materials and tools.[10] At the same time, make learners familiar with the technical process, and don't forget to fear the difficulty of technical development.
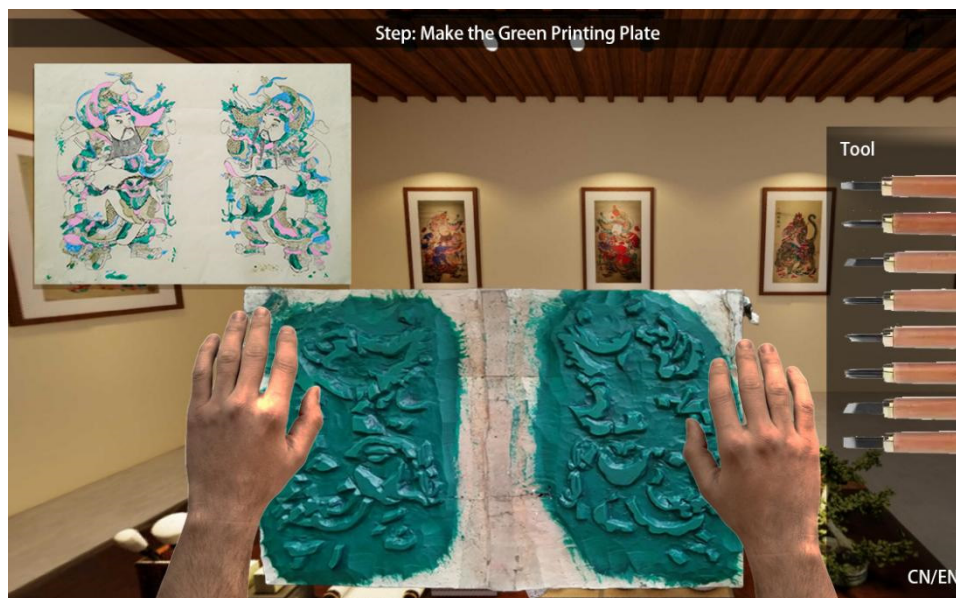

Fig.2.Simulate interactive production of color printing plate.

5.3 Curriculum Culture Extension

As a part of traditional culture course, the content of Liang Ping's New Year pictures can make learners have a deep understanding of the content through the program interaction of relevant culture, craft, art and theory in the course. Abroad, Hoffmann and Ivcevic proposed that teenagers' application of digital technology is conducive to improving their artistic creativity.[11] Mihelj and Regina pointed out that digital media technology can improve the participation of art and culture. [12]However, learning materials as a course is far from enough. In order to test learners' mastery of learning, we should set up feedback mechanisms such as course experience and homework in the program to strengthen the knowledge points that we have not mastered, so as to improve the achievement rate of online learning.

6 Conclusions

Taking the content of Liang Ping's New Year pictures in traditional culture class as an example, the program is designed. Through the use of Unreal Engine visual programming (blueprint), material system, real-time rendering technology and other important functional modules, set interesting plot content, and connect the course knowledge points in series. Learners can display images, videos and process simulation operations in an interactive way through the spatial experience of virtual scenes and real scenes, and test the completion of learning with the

feedback function mechanism. As an improved way of modern teaching interaction, with the continuous development of science and technology, there will be more and more ways to improve all aspects of teaching. Only by persisting in constant innovation can we inherit and carry forward traditional culture.

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