Effectiveness of 3D Multimedia Technology in Optimizing Classroom Teaching

YuTing Sun

Center of Education Technology and network, Jilin Engineering Normal University, Changchun, China

*Corresponding author e-mail: syt@jlenu.edu.cn

Abstract. With the continuous development and progress of human science and technology, interactive 3D multimedia technology is gradually integrated into classroom teaching. Nowadays, the application of 3D multimedia technology mobilizes students' enthusiasm for participating in the classroom and students' initiative for classroom learning. It concretely presents the content that is difficult for teachers to express in the classroom, and improves the pertinence of teaching. This article mainly studies the effectiveness of 3D multimedia technology in optimization in college teaching. This article analyzes the specific applications and effects of 3D multimedia technology, including its basic concepts and application advantages in human anatomy practice teaching. The experiments in this article found that after applying 3D multimedia technology to achieve 3D reconstruction, the motion clarity of the viewing operation process during surgery was greater than 45%, and the highest viewing degree without 3D multimedia technology was 27%. It can be seen that the 3D multimedia teaching mode has a significant effect on improving the quality of teaching.

Keywords: Multimedia Technology, Virtual Reality, Optimized Classroom Teaching, Teaching Effectiveness

1. Introduction

The current wave of integration for information technology and disciplines is changing Chinese education with a sweeping trend. The integration of information technology and discipline is not simply adding a little information to traditional classrooms. 3D multimedia, as a new project emerging from the ground, is still in the exploratory stage in the application of education. The unique interaction mode of 3D multimedia technology enables students to selectively study relevant chapters according to their learning situation, which improves the learning efficiency of students. In the course of the development of the times, the teaching mode adopted by China's colleges and universities is no longer a single mode, but has developed to a higher level. The combination of 3D multimedia technology and modern information technology is also in line with the development of the times and has important practical significance. As far as the current situation is concerned, 3D multimedia is a teaching method that still needs to be explored. It uses three-dimensional form to impart knowledge to students,
students can display graphics in a more 3D way. Therefore, it has aroused students' interest in learning and is of great significance to the further construction of the system.

At present, due to the uniqueness of some classroom teaching, good teaching work cannot be completed. The traditional teaching method mainly relies on the teacher's verbal teaching to pass the teaching content to the students, and the teaching process is explained through the body language [1-2]. Because the video played during the classroom teaching does not have a multi-angle and three-dimensional presentation mode, there are still many blind spots in the entire viewing process. Coupled with the fast video playback speed, students' operations on the teacher or doctor and their environment The look and feel is ambiguous, and it is impossible to find the correct processing method and understand the importance of important operating steps and processes, and it is impossible to interpret the entire process by itself. It can be said that teachers are at the core of the entire teaching process [3-4].

How to make the virtual reality technology enter the classroom and face the students, make it closely connected with the education and teaching process, give play to its unique advantages in technology, and show its value in education and teaching has become an in-depth study of educators. Important topics [5-6]. With the continuous development and progress of scientific and technological means, we can introduce 3D virtual technology based on the Internet into classroom teaching, develop teaching resources based on virtual reality, and create a distinctive teaching environment for classroom teaching, thereby enriching And promote the development of classroom teaching [7-8]. Although there have been related studies on it, there are still few related literatures. In view of this situation, this article combines some teaching experience and the teaching of special teachers to explore the use of 3D multimedia in classroom teaching, hoping to have a certain role in promoting and promoting classroom teaching.

2. Method

2.1 Situational Teaching Method

Situational teaching refers to a variety of teaching modes related to various situations, and it is not limited to being guided by situational cognition and learning theory; narrowly defined situational teaching refers to the establishment of mainly based on situational cognition and learning theory. More stable and mature teaching mode. In this article, the situational teaching we discussed is mainly narrow [9-10].

The systematic and concise application of multimedia technology in the classroom makes the teaching focus clear and the audience absorbs knowledge easily. As a result, scholars and teachers are increasingly using PowerPoint, one of the multimedia technologies, in daily teaching. However, with the development of science and technology, especially the development of computer technology, this kind of courseware presented in the form of text plus multimedia materials carries mostly the core words in simple textbooks. Although factors such as pictures, sounds, videos, and animation materials have also been appropriately added, students can only simply browse through the teacher's explanations, and are bound to the ideas designed by courseware designers. Such courseware is in some courses that emphasize hands-on ability and contains many experiments. Students can only read some experimental steps or see simple experimental animation demonstrations through the courseware. They cannot realistically set the corresponding experimental parameters and intuitively view Real-time experimental results. As a result, the content displayed by teachers in the classroom cannot be effectively absorbed and accepted by students, and the value of using multimedia technology is lost [11-12].

In teaching, there are a lot of technical terms and professional descriptions. Learners will feel abstract and incomprehensible in the process of learning, leading to the exhaustion of students' enthusiasm for learning and interest, leading to unsatisfactory teaching results. 3D multimedia teaching reflects the abstract and complex knowledge points in textbooks through various methods such as text generation, 3D imaging, and video. 3D multimedia technology transforms the
old-fashioned teaching method into a dynamic, intuitive and more spatial teaching method, which is convenient for students to grasp the knowledge in all aspects. For example, the complicated neural pathways and wall charts in medical sciences can only learn their internal structure on a plane, and their spatiality is poor. The three-dimensional images in 3D multimedia can clearly show the neuromorphology and its dominant structure, which is conducive to students' understanding. 3D multimedia teaching can show the process of neuron pathways from various angles and planes, and even can be used to simulate the animation of neural structures to enhance the understanding of key parts. Forming a clearer layered and three-dimensional structure diagram just makes up for the lack of projecting slides in the past, which is also the advantage of 3D multimedia. In addition to mastering the knowledge, students also feel that 3D multimedia is as novel and exciting as cartoons, which makes the previously complex and difficult to understand knowledge simpler, which is more conducive to the mastery and understanding of the anatomy in the classroom. It makes the boring teaching classroom appear to the students like interactive games, which in fact improves the pertinence of classroom teaching and the students' sense of interest in learning.

2.2 Constructivist Learning Theory
The basic view of constructivism is that everyone should think about the outside world in their own unique way. The learning of knowledge is not passive learning and memory. Based on the existing experience, we should build a new understanding of the outside world. What educators need to do is lead students to actively experience their outside world, guide them to ask questions, and take the initiative to learn. This theory emphasizes that learners are not a simple extraction of empirical theory. Instead, the knowledge they acquire is specific, rich, and has their own practical experience, so that they can be agile when encountering new problems. Establish new schemas to guide activities. Constructivism calls for the learner's subjectivity, and students should be promoted with the aid of teachers, supplemented by teachers to promote students' active exploration. Exploration is a very valuable way of learning. In order for learners to reach consensus, learners must cooperate and explore, and cooperation can make understanding deeper and more comprehensive. Cooperative learning has received widespread attention in the field of constructivism. To sum up, constructivism requires the subjectivity of learners to be brought into play, requires students to actively construct knowledge, learn independently, and advocates unity and cooperation to achieve a comprehensive understanding of knowledge.

3. Experiment
In the experiments in this paper, the planning shown by the teacher is limited. Through 3D multimedia technology, the key and difficult actions to be taught by the teacher in the classroom can be repeatedly observed and studied from multiple angles.

This article uses 3D multimedia technology to show the key steps of environmental factors in front of students, and to show the key points, difficulties, and precautions of the actions in a targeted manner, and then explain by teachers, so that students can understand visually, intuitively and effectively. Master technical action. Feedback to students to watch. Through video, form interaction and contrast, let students observe more clearly, compare with others and teachers, find errors, self-correct and improve. This will not only allow students to understand the key points, difficulties, precautions, but also allow teachers to clearly understand the deficiencies of each student and problems in teaching. Stimulated the students 'enthusiasm for learning, activated the classroom atmosphere, thereby improving the quality of teaching, and to a certain extent cultivated students' ability to analyze key points, difficulties, and precautions.

4. Discuss

4.1 Experimental Test Analysis
After the completion of regular teaching, students are self-taught, and their levels before and after
self-study are assessed separately, and changes in dance levels before and after self-study are compared. We found that the 3D video experimental class has a clear understanding of dance movements. In the process of self-practice, it has a clear understanding of its own errors and deficiencies, and has a strong pertinence and pertinence.

This article compares the clarity percentage of several technical movements in practice. As shown in Table 1 and Figure 1, the technical clarity of all 3D multimedia teaching is greater than 45%, and the highest is 27 without 3D multimedia technology. It can be seen that the three-dimensional multimedia teaching mode has a significant effect on improving students' dance level.

**Table 1.** Percent clarity of technical actions

| The class | Number of people | Full screen scrolling for technical clarity | Technical definition of lifting | Reflexive technical clarity | Lead and follow technical clarity |
|-----------|------------------|--------------------------------------------|-------------------------------|----------------------------|----------------------------------|
| Experimental classes | 100 | 58% | 47% | 51% | 45% |
| That in comparative classes | 100 | 23% | 27% | 19% | 12% |

![Figure 1. Comparison of clarity of technical actions](image)

4.2 3D Multimedia Technology to Optimize the Effectiveness of Classroom Teaching

This technology has important practical significance in the development of modern society. The use of 3D technology can show scenes that could not be directly reflected in the virtual form. This is 3D multimedia technology. The biggest breakthrough in multimedia teaching is deeply loved by students and more easily accepted by students. In order to give full play to the role of supporters and collaborators, teachers require teachers to set up platforms for student-to-student and student-teacher communication to help students learn independently; teachers are also encouraged to encourage students to evaluate them to improve teaching quality. Using 3D multimedia teaching, teachers can use...
the mouse to click the path of each path during the class, and can enlarge the path or rotate the screen 360 degrees. Multi-angle and multi-level display the internal walking structure of the conduction pathway. The structure that could not be seen in the wall chart, specimen or model was displayed completely and intuitively on the large screen of the projector. Allow students to see the process structure of each nerve at a glance, which just solves the intuition in the past. In addition, there is another benefit in using 3D multimedia for the teaching of neural pathways. When the teacher finishes the class, students can copy the courseware. After class, they use the mouse to control the 3D multimedia by themselves, allowing them to operate the computer and multimedia.

5. Conclusion
In modern classroom teaching, in order to cultivate students' practical ability and observation ability, many courses often require students to carry out a large number of experiments, but experiments in real environments often have many restrictions. These restrictions have become an important factor restricting the improvement of teaching quality. 3D multimedia interactive courseware and virtual experiments are effective solutions to this problem. They have the characteristics of low cost, real-time interaction and perception, sharing, collaboration, reusability, etc., and they can break through time and geographical boundaries, enabling teachers and students, students and students to communicate in real time, thereby making teaching more convenient, authentic, intuitive and effective.

References
[1]. Emily S.Kahm.Secret missions:A successful classroom teaching tactic that can be replicated by other instructors[J].Teaching Theology and Religion,2019,22(1):52-52.
[2]. Christoforos Kostaris,Stylianos Sergis, Demetrios G Sampson. Investigating the Potential of the Flipped Classroom Model in K-12 ICT Teaching and Learning: An Action Research Study[J]. Educational Technology & Society, 2017, 20(1): 261-273.
[3]. Paul J. White, Som Naidu, Elizabeth Yuriev. Student Engagement with a Flipped Classroom Teaching Design Affects Pharmacology Examination Performance in a Manner Dependent on Question Type[J]. American Journal of Pharmaceutical Education, 2018, 81(9): 5931.
[4]. CAIYan-rui. On the Feasibility of the Class-based Flipped Classroom for English Phonetics[J]. Overseas English, 2017(5): 472-474.
[5]. Dmitry Lubyako, Gordon Martinez-Piedra, Arthur Ushenin. Understanding the Doppler effect by analysing spectrograms of the sound of a passing vehicle[J]. Physics Education, 2017, 52(6): 065004.
[6]. Lori Leibold, Ryan W. McCrery, Emily Buss. Classroom acoustics and children's speech perception[J]. Acoustical Society of America Journal, 2017, 141(5): 3457-3457.
[7]. Todd Womble. Teaching Tainted Lit: Popular American Fiction in Today's Classroom Janet G. Casey, Editor. University of Iowa Press, 2015.[J]. Journal of American Culture, 2017, 40(1):8.
[8]. Habib M. Fardoun, Hachem Awada. Mobile Technology to Support the Interactive Classroom[J]. International Journal of Web-Based Learning and Teaching Technologies, 2017, 12(4): 38-47.
[9]. Amber Shamim Sultan. The Flipped Classroom: An active teaching and learning strategy for making the sessions more interactive and challenging[J]. Journal of the Pakistan Medical Association, 2018, 68(4): 630-632.
[10]. Feng Shao, Wenchong Lin, Weisi Lin. An Energy-Constrained Video Retargeting Approach for Color-Plus-Depth 3D Video[J]. Journal of Display Technology, 2017, 13(5): 491-499.
[11]. Pengfei Wu, Yiguang Liu, Mao Ye. Fast and Adaptive 3D Reconstruction With Extensively High Completenss[J]. IEEE Transactions on Multimedia, 2017, 19(2): 266-278.
[12]. Sara Ershadi-Nasab, Erfan Noury, Shohreh Kasaei. Multiple human 3D pose estimation from multiview images[J]. Multimedia Tools & Applications