Application of Computer Vision Media Simulation Technology in Distance Education of New Generation Labor Productivity

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Abstract. With the rapid development of the information age, it has promoted the development of all sectors of society, including education, to a certain extent. It is no longer a problem to use modern educational technology in teaching. In the teaching of computer vision media simulation technology courses, the use of modern educational technology can effectively enhance the teaching effect. The purpose of this article is to study the application of computer vision media simulation technology in distance education of the new generation of labour productivity. This topic uses the data collection method and action research method to study the effect of multimedia education teaching in changing the learning style of high school students, and conducts questionnaire surveys of students before and after the experiment, and analyses the differences in the survey results. The analysis results show that computer vision media simulation technology has improved experimental skills to varying degrees. Among them, it is believed that the biggest improvement is the standardization of operation (26%). The second only to the operation skills is the expansion of students' knowledge, accounting for 25%.

Keywords: Computer Vision Media Simulation Technology, Distance Education, Independent Sample Difference Test, Questionnaire Survey

1. Introduction

1.1 Background and Significance
Under the pressure of continuous reform of basic education, the use of multimedia materials in higher education has become an important form of information education and training. It is used as a tool for teacher training and education, educational environment creation, student recognition and recognition in the classroom [1]. It plays a very important role. Multimedia education and education are increasingly used in school education. Since ancient times, high schools and chalk classes on blackboards have used teaching methods. This method is relatively opposite, that is, they are relatively old, unable to meet the needs of high-quality human resources, do not meet the requirements of modern higher education, and promote educational technology the formation and educational reform [2]. The demands of the new curriculum reform require teachers to respond to these new challenges
and historical trends with new attitudes and perspectives. The historical mission of modern teachers is to explore new methods and new teaching models in high school classrooms under modern circumstances, so as to make more effective use of modern education and educational media [3].

This is an application of multimedia technology, which gives new strength and vitality to existing education. Multimedia technology is widely used in higher education and courses, especially in classroom reforms and teaching methods and methods widely practiced in higher education [4]. Multimedia education is a new type of modern education and training. It has had a significant impact on traditional education and aroused public education thinking. This research provides effective methods that can help teachers improve their teaching methods, improve their ability to adapt to new courses, and use multimedia educational resources to change students' learning habits [5].

1.2 Related Work
As the core issue of the new curriculum reform, the transformation of students' learning style has received widespread attention. Minamitani N believes that changes in student learning styles are the starting point and basis for changes in teacher education and evaluation methods, and this change has a direct impact on the curriculum [6]. However, setting up school-based courses is an important tool to change students' learning styles by stimulating students' potential and strengthening course choices [7]. Students' original foundation, personal growth direction and learning needs. Good learning conditions and greater development space are conducive to the development of students' abilities and personality.

On this basis, we carried out the "Application Research of Computer Vision Media Simulation Technology in Distance Education of New Generation Labor Productivity" [8]. The operation of multimedia training helps to update educational content and methods, and optimize educational links [9]. The use of multimedia technology has brought about many conceptual changes in education and training. Multimedia education has been widely used as a new way of large-scale and diverse expressions in education. High school will inevitably lead to changes in the learning style of high school students [10].

1.3 Main Content
Through learning computer vision media simulation technology, and analyzing the development history of distance education, on the basis of consulting a large number of literature materials, this thesis conducts the following research:

The first chapter mainly introduces the development and status quo of distance education in this article, as well as the research purpose, significance and related work of the thesis.

The second chapter introduces the research methods of computer vision media simulation technology in distance education of labor productivity of the new generation.

The third chapter introduces the comparison of the pre- and post-test of the LPQ survey of students, and conducts experimental action research on students.

The fourth chapter introduces the analysis of experimental data and questionnaire survey results, and a detailed introduction to the test experiment.

The fifth chapter summarizes the specific work of this thesis on distance education research, and makes a prospect for the next step.

This topic focuses on whether the learning style of high school students will change during the implementation of multimedia education and teaching.

The innovation of this topic research lies in: according to the characteristics of the subject, combined with the new curriculum concept, exploration is conducive to promoting high school students to form independence, inquiry, and cooperation the method and content of multimedia education and teaching of learning style.

2. Experimental Methods of Computer Vision Media Simulation Technology in Distance Education for Students
2.1 Data Collection Method
This article obtains the current situation, shortcomings and future development trends of computer vision media simulation technology in the application of distance education in my country through the Internet access to CNK journals and Baidu Encyclopedia resources by going to the library to read related journals and magazines, and thus To understand the development and use of computer vision media simulation technology in distance education and teaching.

2.2 Action Research Method
The action research method is the process of implementing specific measures under specific educational situations, combining different research methods and methods, applying them to specific tasks and drawing valuable experimental conclusions according to a pre-established training schedule. Start with planning and then execute the implementation process. The implementation process will carefully observe, record and archive data, clean up the data, analyze the problems behind it, and conduct detailed investigations after the data is discovered. This process is simply described as planning one action, one observation and one reflection: and then after re-planning-repeated action and repeated observation-repeated reflection on multiple experimental operations and research, the final conclusion is whether the hypothesis is correct and objective.

2.3 Questionnaire Survey Method
The questionnaire survey method is a method of information collection that encourages respondents to create detailed surveys. A series of questions or question forms related to the survey objectives created for the survey are called surveys. It is a widely used tool for people who collect information as part of their social research activities. Researchers can use this tool to accurately and specifically measure the progress of social activities, apply social statistical techniques to describe and analyze the quantity, and provide the required survey data.

3. Application Experiment of Computer Vision Media Simulation Technology in Distance Education of New Generation Labor Productivity

3.1 Difference Test of Independent Samples
The so-called independent sample means that the individuals in the two samples are randomly selected and there is no one-to-one correspondence between them (a non-deterministic relationship). Such two samples are called independent samples. The object of this thesis is to conduct biological experiment research on all students in Class 5 and Class 6 of Pingliang No. 2 Middle School. Independent samples with independent sample sizes n1 and n2 greater than 30 are called independent large samples.

(1)The standard error of the difference between the mean of two independent large samples is estimated with the following formula when the standard deviation of the two corresponding populations is known:

$$\sigma_d = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

(1)

Among them, \(\sigma_1^2\), \(\sigma_2^2\) represent the overall variance of the first and second variables, and n1, n2 represent the capacities of the first and second samples.

The standard error of the difference between the mean of two independent large samples is estimated with the following formula when the standard deviation of the two corresponding populations is unknown:

$$S_d = \sqrt{\frac{S_{x1}^2}{n_1} + \frac{S_{x2}^2}{n_2}}$$

(2)
Among them, \( \sigma^2_{x_1}, \sigma^2_{x_2} \) represent the variance of the first and second samples respectively, and \( n_1, n_2 \) represent the capacities of the first and second samples respectively.

3.2 Conduct Action Research on Students Participating in the Experiment
First design the plan, and then proceed with the implementation process step by step. During the implementation process, carefully observe, record and retain the data, later organize the data, analyze the problems behind the data, and conduct in-depth reflection after the problems are found. This process is simply described as a plan one by one Action—observation and reflection; and then after re-planning—repeating action and observation—rethinking many experimental operations and research, finally it is concluded whether the hypothesis is correct and objective.

(1) The first round of action research
   1) Plan: Strengthen the guidance of experimental operation and the standardization of student experiments through multimedia biological experiment classroom video technology. In order to achieve the significance of providing typical demonstrations for students to operate experiments.
   2) Action: Instruct students to watch a video course on the extraction and separation of pigments from chloroplasts.
   3) Observation and reflection: Experimental video can quickly and vividly verify the type, distribution, and composition of chloroplast pigment, and greatly reduce the risk of the experiment.

(2) The second round of action research
   1) Plan to verify and solve new problems derived from the previous round of action research through the teaching of 3D animation or Flash animation in the multimedia biological experiment classroom.
   2) Action: Students are divided into groups to conduct experiments, and teachers should correct and correct errors in the experiments.

Observation and reflection: Through the classroom atmosphere and students' experimental attitudes, it is discovered that the use of multimedia animation to observe the experimental process and experimental phenomena has greatly improved students' enthusiasm, divergent thinking is extremely active, and their own subjective initiative is exerted in independent experiments.

4. Experimental Analysis and Questionnaire Survey Analysis

4.1 Difference Test Experiment of Independent Samples
Before and after the experiment, students in the second grade (5) of the control group and the second grade of the experimental group (6) were investigated by the "Learning Process Questionnaire (LPQ)". From the learning method to conduct survey statistics and calculate the standard score, at the same time, the independent sample difference test (T-test) is used to test the significance of the difference statistics. The results are shown in Figure 1 and Table 1: (where method = strategy + Motivation, the standard for judging the significance of the difference is \( p \leq 0.01 \) means the difference is very significant, \( p \leq 0.05 \) means the difference is significant)

| Inspection Type | Test Group | Control Group | T Value | Difference      |
|-----------------|------------|---------------|---------|-----------------|
| Motivation      | Pre-test   | 21.01         | 20.79   | 0.22            | Not Obvious     |
|                 | Post-test  | 20.34         | 20.62   | 0.28            | Not Obvious     |
| Strategy        | Pre-test   | 21.12         | 22.75   | 1.63            | Not Obvious     |
|                 | Post-test  | 20.38         | 23.16   | 2.78            | Obvious         |
| Mode            | Pre-test   | 42.13         | 43.54   | 1.41            | Not Obvious     |
|                 | Post-test  | 40.72         | 43.78   | 3.06            | Obvious         |

Table 1. Pre-test and post-test comparison of learning styles of experimental group and control group
This icon indicates that changes other than the mode are important. By comparing relevant test data before multimedia teaching, it can be confirmed that there is no significant difference in the biological performance of the control group and the test group during the research process, such as T-level test results. The biological performance of the control group and the experimental group selected in this study can be considered basically the same. However, the results after the test showed that the biological test results of students in the experimental group using education and multimedia teaching were higher than those in the control group, and the difference was statistically significant.

4.2 Questionnaire Survey Analysis
(1) The reliability and validity of the questionnaire
The reliability and validity of the research need to be tested. After completing the student survey, we will collect a certain amount of survey data, evaluate its reliability and validity, and distribute it to senior students. The inspection method is as follows.

The four junior high schools conducted a questionnaire survey, collected data, and tested the reliability and validity of the survey.

According to calculations, the reliability coefficient of the questionnaire is 0.802–0.912, and the reliability of the two questionnaires is greater than 0.4, which is high in reliability and validity.

(2) Result analysis
First of all, the favorite statistics of students who apply modern multimedia technology teaching methods in biology experiments are shown in Figure 2 and Table 2.

Table 2. Statistics on how modern multimedia technology improves students' biological experiments and biological learning

| Skill                          | Number of people | Skill                  | Number of people |
|-------------------------------|------------------|------------------------|------------------|
| Operational Standardization   | 30               | Shorten Experiment Time| 13               |
| Add Fun                       | 12               | Fully Understand the Principle | 9               |
| Expand the Amount of Knowledge| 29               | Improve Learning Efficiency | 15              |
| Other                         | 8                |                        |                  |
5. Conclusions
Distance learning is about optimizing training and achieving goals. The problem of distance learning is no longer a problem. At the same time, everyone has the same opportunity to learn independently. With the development of distance learning, a combination of online and offline training modes are used to take advantage of two dual education modes. This is a method worth interrupting the current distance learning. Now, new media technology is becoming more and more complex. One of the development trends of new media is the integration of technology and terminals. Some interchangeable ones have some common points. The development of new media requires active support from the state, the abolition of media monopoly and the free development of new media. Multimedia courses can also increase the amount of information in the classroom. Teachers not only have the ability to digest and absorb the knowledge they have learned, but also have the relationship between teaching ability and student acceptance, and how to understand the rationality and scientific nature of multimedia education content. A high level of control and recording ability is required. Research on this subject has certain limitations. Although multimedia education and research have many contents and directions, this topic focuses on the study of changes in students' learning styles, while other aspects require further research.

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