Optimization of Physical Education Teaching Strategies in Colleges and Universities in the Context of Modern Information Technology

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Abstract: Along with the development of society, sports informatization has also started to receive attention from schools. The promotion of sports informatization can innovate sports teaching methods, effectively improve teaching quality and thus cultivate better social talents. The purpose of this paper is to study the optimisation of teaching strategies in colleges. The methods for the optimisation of physical education teaching strategies are analysed, and the application of information technology in education is taken as the main object of study, with different optional basketball students being observed and studied in the experiment. Through the practical application in the teaching process, it is found that the optimization strategy of physical education can improve the basic theoretical knowledge of students.

1. Introduction

Today, computer networks have a huge impact on politics, economy, culture and society around the world [1-2].The use of information technology in teaching is becoming more and more popular, and the technology in competitive sports will certainly promote its popularity in physical education [3-4]. The application of information technology can not only display the content of physical education more comprehensively, intuitively and vividly, In addition, teaching resources are further shared through the Internet to break through the restrictions [5].

If teenagers' sports tests are properly used in schools, they can play a role in school-age children's sports lifestyle. Unfortunately, there are many problems with the testing of student sport-related competency (HRF) components, such as privacy issues, inappropriate use of test results and time-consuming testing procedures. Samuel NiiBoi Attuquayefio provides an alternative to the implementation of youth sport tests to address these long-standing problems. The history of comprehensive youth proficiency testing practices is first presented, followed by strategies for conducting proficiency self-assessment (PE) using emerging technologies rather than more traditional PE testing methods [6].John Paul C. Flaminiano uses a design effects analysis of a PE teaching case as a basis for first using the python standard libraries: jieba and wordcloud, pandas, and Numpy to analyse the design of teaching notes for MOOC course cases. Then using statistical

techniques and data visualization, the physical fitness test data of 7,172 students in a university were analysed for 15 consecutive years, such as an attempt to evaluate the course system design, course case design and student physical fitness test data analysis [7].

By analysing the specific application of information technology in the basic theory of school sports and the emotional cultivation of students, this study deepens the theoretical and practical basis for the application of information technology in school sports, and proposes specific measures to give full play to the role of information technology in the development of school sports in a practical context.

2. Optimization of Teaching Strategies

2.1 Information Technology and School Sports

(1) Information technology promotes educational reform in school sport

The information technology has driven a new global educational reform. The technological revolution has put forward many demands for change in education, requiring a systematic reform of the content system. School sport is an important part of the overall development of education [8-9]. Along with the new economy, school sport must follow the trend of the times and accelerate the pace of reform. Educational reform involves a range of issues such as educational philosophy, teaching models, educational management systems and curriculum and teaching systems.

Education itself means improving the inheritance and development of a country's culture and values. Only through the continuous development of education can a country be strong [10]. For every change in social form, there is a strong impetus for technological revolution. Every technological advance adds new intellectual content to education and new forms of transmitting knowledge to it. In the face of an unprecedented information technology revolution with a powerful national mission, profound changes in the traditional educational model have become a historical imperative [11-12].

Physical education is an important part of education, based on disciplines and in line with the requirements of the "knowledge economy". Information technology will play an important role in the development of physical education, and it will affect all aspects of physical education. The reform and innovation of physical education requires the cooperation of information technology, as well as the planning and development of technology [13].

(2) Informatization of school sports

Sports information is a requirement of physical education in the information age and the integration of modern information technology with sports. With the technology, teaching methods and teaching methods are bound to undergo fundamental changes [14]. At present, there is still much room for the development of school sports information in China, and schools must reasonably develop information technology, apply it universally in school sports planning, and increase the development.

2.2 Physical Education Optimization Strategies

(1) To continuously improve teachers' information technology skills

Technologies such as computers have not only changed people's lives, but also influenced teaching concepts. Similarly, the development of information technology has put forward higher requirements for physical education teachers, i.e. as physical education teachers, they must not only master teaching skills and professional knowledge, Moreover, it can help teaching to continuously improve the application scope of information technology in subject teaching, combine information technology with traditional physical education, and extend information technology to all physical

education processes[15-16] . Schools and universities should provide regular IT training to PE teachers, use holidays and other time to provide a platform for teachers to learn IT, and organise teachers with strong IT skills to develop resources Develop reasonable plans and targets for IT-assisted PE teaching and improve the application of IT in PE teaching.

(2) To cultivate good habits of IT use in students

Many people believe that the learning of information technology depends entirely on the training of information technology courses such as computers. This view is one-sided. Although IT courses are an important part of the development of learning skills, they cannot be applied in isolation from other courses. IT development must be integrated with the characteristics of each subject and permeated into other courses such as the PE curriculum in order to enhance and develop students' ability to apply IT in the teaching and learning process of the PE curriculum. In order to develop the concept of using the Internet for learning, if schools and universities spend a lot of manpower and resources to create an online learning environment, but students do not make use of online learning initiatives, the rich resources are wasted.

(3) To integrate IT teaching with subject teaching at a deeper level

In order to take advantage of IT to develop curriculum materials, good PE materials should not only include tutorials but also include curriculum support websites for students to ask questions. However, as IT has begun to emerge in recent years and many PE teachers have limited skills, IT courses can integrate the needs of PE with specific teaching software such as data analysis software and processing software and the PE curriculum.

3. Object of Study and Research Methodology

3.1 Research Subjects

This paper is based on a study of teaching strategies in colleges in the city of M. Some students in some colleges and universities in the city were surveyed.

3.2 Teaching Experimental Method

The study used an experimental teaching method with 80 students of the basketball elective course, who were notified in writing before the experiment and randomly divided into an experimental group and a control group with their consent. The control group was taught using the traditional physical education classroom model. The teaching design of the experimental group was as follows.

(1) Create a WeChat group

Teachers will post web links in the WeChat group, which students can see directly in the WeChat group through their handheld devices and can communicate and discuss in the WeChat group.

(2) Making pre-class plans

The day before class, the PE teacher arranges for the students to watch a basketball instructional video. The videos are based on the daily basic training of basketball students as classroom materials and the sports skills videos are watched before class. The first step is to understand the basic body positions and movement trajectory of the sports skills. The students are also asked to discuss with the group.

(3) Preparation activities are arranged

The PE teacher organises stretching exercises for the students to make the body joints and muscle tissues fully active, to improve their physical adaptability and to effectively prevent sports injuries.

(4) After-class arrangements

After the basketball lesson, the physical education teacher organises students to further consolidate the students' mastery of sports skills and watch the post-lesson video.

3.3 Questionnaire Survey Method

The corresponding questionnaire was designed according to the needs of the study and experts were invited to assess the validity of the questionnaire; the respondents were surveyed and the validity of the questionnaire was again proved. The questionnaire data was collected and collated to visualise the teaching effectiveness of the experiment.

3.4 Mathematical and Statistical Methods

Excel was used to classify the data, import the data into the trial version of IBM SPSS Statistics, and conduct t-tests on the relevant data. To provide a technical guarantee and scientific basis for this research, and t-tests were conducted. The t-test formula used in this paper is shown below.

$$t = \frac{\overline{X} - \mu}{\frac{\sigma X}{\sqrt{n}}} \tag{1}$$

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}(\frac{1}{n_1} + \frac{1}{n_2})}} \tag{2}$$

Where equation (1) is a single overall test. Equation (2) is a double overall test.

4. Comparative Analysis before and after the Experiment

4.1 Influence Basic Theory Teaching

The students' theoretical scores were tested separately before teaching, where the statistics of the theoretical test scores are shown in Table 1.

Table 1: Test results of basic theoretical knowledge before teaching

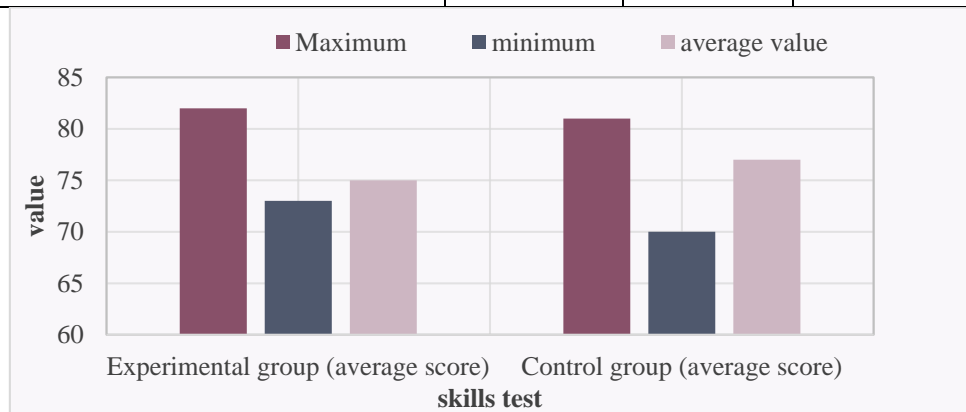| Skills test	Maximum	minimum	average value
Experimental group (average score)	82	73	75
Control group (average score)	81	70	77
T	0.071	0.064	0.075

Figure 1: Statistics of theoretical test scores

According to the analysis of students' performance in the two groups during the same period, the highest score in the theory exam before the experiment was 82, the lowest score was 73 and the average score was 75, as shown in Figure 1. The p-values obtained by the difference tests were all greater than 0.05.
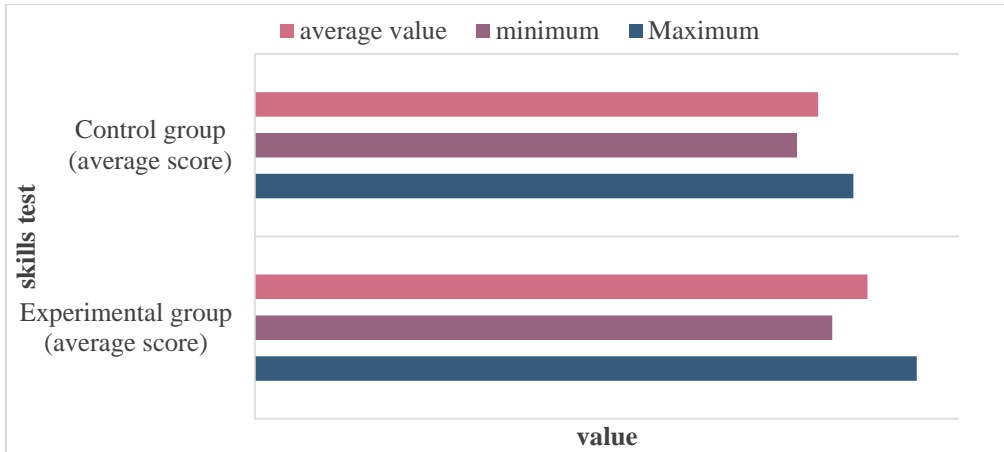

Figure 2: Statistics of theoretical test scores of the two groups of students after the experiment

The results of the changes in the theoretical test results of the two groups of students after the experiment in Figure 2 show that there are large differences between the theoretical test results, minimum and mean values of the experimental and control groups.

4.2 Affect Students' Emotions

Before and after the experiment, the students' learning attitudes were tested respectively, in which the statistics of the students' learning attitude evaluation results are shown in Figure 3.

Table 2: Pre-experiment learning attitude test

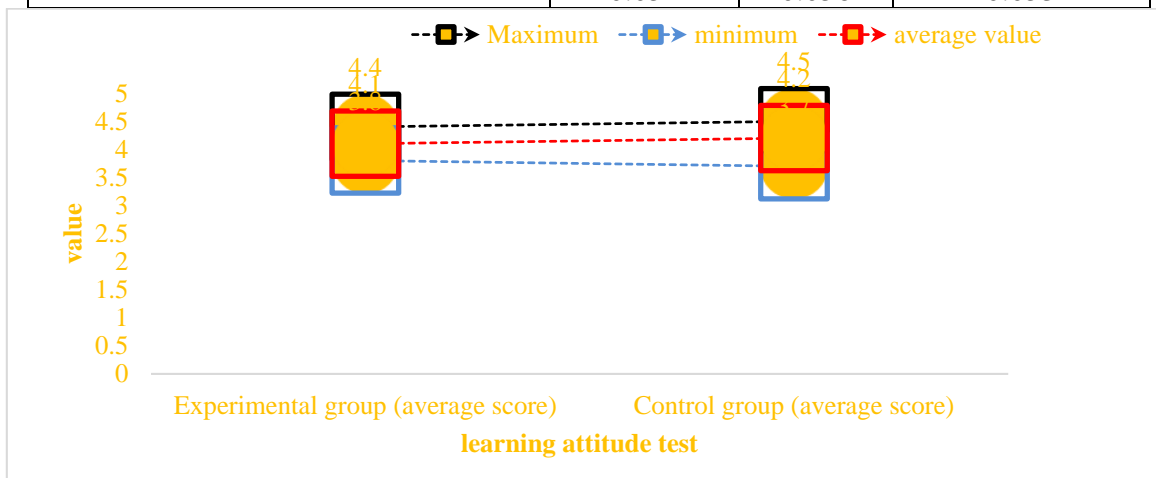| Learning attitude test	Maximum	minimum	average value
Experimental group (average score)	4.4	3.8	4.1
Control group (average score)	4.5	3.7	4.2
T	0.051	0.056	0.053

Figure 3: Comparative statistics of the two groups of students' attitude evaluation scores before the experiment

There was no significant difference between the scores of the experimental and control groups on the Attitude to Learning Test, as shown in Table 2, and the p-value obtained from the difference test was greater than 0.05, indicating that the learning situation of the two groups was basically the same before the experiment started.

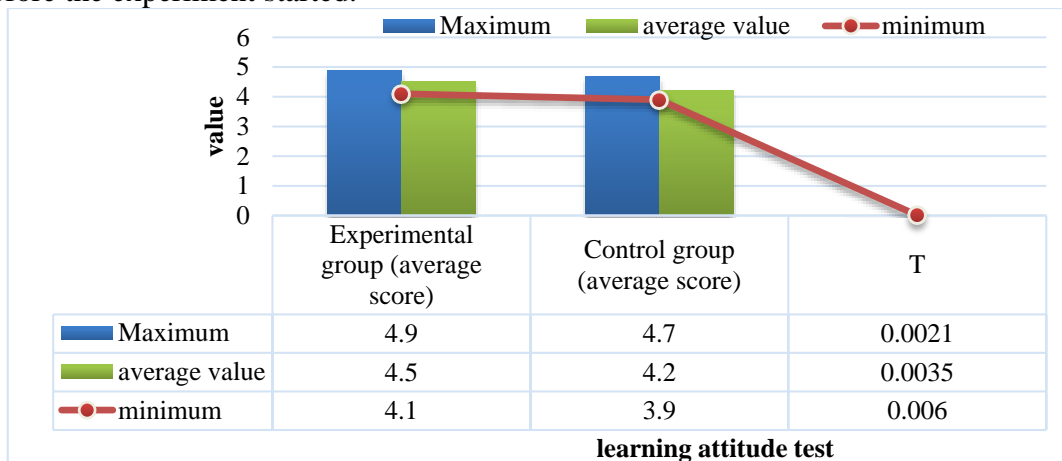|	Experimental group (average score)	Control group (average score)	T
Maximum	4.9	4.7	0.0021
average value	4.5	4.2	0.0035
minimum	4.1	3.9	0.006

learning attitude test

Figure 4: Comparative statistics of students' attitude evaluation scores after the experiment

Figure 4 showed that the learning attitudes of the students in both groups changed at the end of the experiment. However, the students in the experimental group experienced more significant changes in their learning attitudes through IT learning, while the students using traditional teaching methods did not experience significant changes in their learning attitudes, thus showing that the use of IT in basketball teaching more significantly improved the students' learning attitudes.

5. Conclusions

A comparative analysis of the experiments led to the following conclusions:

Both methods can effectively understand the basic theoretical knowledge of motor skills, but the use of modern IT in the classroom is more effective.

The introduction of modern information technology into PE classes can better guide students in their own learning, giving teachers more time to correct students' mistakes and guide them in correcting technical errors. At the same time, modern IT can visually reflect problems that arise in student practice and help learning to further refine technical actions.

The use of modern information technology can help teachers to make up for the lack of demonstration, and the constant repetition of correct demonstration actions can help students to establish better standards of technical actions in their minds; with the help of modern information technology, students can also observe and compare their own technical actions at any time, changing the way they learn and improving their learning efficiency.

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