Research on the Teaching Model of Interactive Physical Training Based on Computer Platform

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Abstract — Objective: In order to improve the teaching effect of Physical Education. Methods: Establishing a model of interactive physical training based on computer platform. Process: The article puts forward the problems existing in the teaching of modern physical education, analyzes the feasibility of interactive teaching, presents the mathematical model of the interactive teaching evaluation system, structures the architecture of the scalable secure computer platform, and establishes the model of interactive teaching strategy. Results and analysis: The paper studies the practical way of interactive teaching strategy based on computer platform, analyzes the experimental data of interactive teaching of physical education, and finds that the teaching mode improves the students' self-efficacy. Conclusions: The interactive physical training model based on computer platform has a good teaching effect.

Keywords - Physical Education; interactive physical training; computer platform

I. INTRODUCTION

Classroom teaching is the basic form of the school teaching work, which is to cultivate students' ability, and an important part of improving students' scientific quality. Classroom is the key to improve the quality of teaching, classroom teaching is good, the students in the classroom is with spirit concentration, thinking open, answering the question fast, the good coordination between the students and teachers, on the contrary, the students will be in low spirits, lassitude, and poor coordination between teachers and students. Master graduate course teaching is no exception. At present, the number of graduate students enrollment continues to increase, the professional category is also increasing. In 2009, the country began to recruit full-time Master of physical education graduate students. Compared with previous studies on the academic master's degree in physical education, the cultivation objective is to be applied to the application, which is mainly to cultivate high level and applied talents [1]. In order to achieve this goal, the pilot colleges and universities actively explore effective teaching methods. However, in the present stage of physical education teaching mode, because of the current graduate students in our country, there is a serious lack of the formation and development mechanism of students' subjectivity, and is bound by the traditional teaching ideas, in the process of classroom teaching, the phenomenon of teachers' speaking and students' listening, and the phenomenon of simply imparting knowledge are ubiquitous, which seriously affect the students' learning initiative. Therefore, in recent years, the development trend of educational reform is increasingly emphasized in the process of teaching and learning, and the interactive teaching mode is born. Interactive teaching is proposed by Palincsar (In 1982), then we got further research and development. The classic one was that McCray professor did experimental research on USA interactive, he divided the students into 12 groups of cooperative learning. Through the Internet and put the question to the students, then use class to discuss the students' views on the problem. Through the student's answer can know whether the students of these basic concepts obscure, this kind of quick feedback can make the teacher solve the problems of the students in time. So we can set up the teaching mode, which is based on the problem, the students as the center, to discuss the main way of obtaining knowledge[2]. In current research in china, the definition and connotation of "interactive" teaching has not yet formed a unified understanding. One view is that the "interactive teaching method, which is the first to provide a model guidance by the teacher, gradually from the guidance to help and promote, and then the students adjust their own learning process." Another view is that the interactive teaching mode is based on the idea of scaffolding instruction, an interactive teaching method based on the background of teacher and student. The former emphasizes the process of interactive teaching, the latter highlights its connotation and characteristics. Actually, interactive...
teaching takes the mutual support and promotion of learners, teachers should help the students to discuss, and the evaluation of the students' speeches should be able to guide students to make more constructive responses [3]. Figure 1 shows a few aspects of modern physical education.

II. MATERIALS AND METHODS

A. Feasibility Analysis Of Interactive Teaching

Interactive teaching is to pay more attention to the communication between people. Higher requirements for teaching resources, such as more than one teacher in the classroom instruction, many teaching sites, etc. Teacher requirements: Each class has a teacher, at least three teachers together to listen to the students to discuss, assist score. Interactive teaching requires teachers to have a wide range of knowledge, in the face of different students from different professional direction, to listen to their speeches and give the evaluation in a timely manner[4]. Teachers should have the spirit of professionalism, to discuss the issue in advance, and to participate in the discussion as much as possible. Teaching object requirements: Have certain professional knowledge, and be able to collect information according to the learning task, analyze the problems raised by the teacher before class and solve the problems. Comprehensive multidisciplinary curriculum is appropriate, in order to help students in different professional direction to express different views. Teaching organization form: Collective teaching, group learning, individual learning various forms. The teaching process organization should be close, need to communicate with the students many times, the class arrangement to discuss the problem, to guide students to discuss in the class, the students' speech to comment, after class. Other teaching resources: Requires a number of teaching places for students to discuss; Multimedia, in order to increase the amount of information; a more comprehensive library and information resources, for students to access information. The teaching resources need to be unified and coordinated, and the teachers play a leading role, teaching process organization is the foundation, the group cooperation is the key [5].

B. Fit Function Design Of Interactive Teaching Evaluation

The fitness function \( f(x) \) in this system indicates that the error between the test attributes and the requirement of the chromosome is obvious, and the fitness function can reflect the difference between the test attributes and the requirements. The fitness function \( f(x) \) is smaller, and the chromosome fitness is better, and it is also the requirement of the test paper. We use the knowledge point error to represent the dynamic adjustment of the learning situation of the knowledge point. The value of the assigned parameter is: \( T_i + D_i \times 17 \). Where \( T_i \) said the answer to the question, \( D_i \) said the difficulty of the problem [6]. And the use of \( C_i \) to express the \( i \) title of the assigned ratio, so there are the following formula:

\[
C_i = \frac{T_i + D_i \times 17}{\sum_{j=1}^{n} T_j + D_j \times 17}
\]
n is the total score of the number of genes in the chromosome K:

\[ C_{ik} = \sum_{i=1}^{m} C_i \]  \hspace{1cm} (2)

Error of K knowledge points in chromosome:

\[ \Phi_{ik} = |C_{ik} - C_{ik}| \]  \hspace{1cm} (3)

Among them, \( C_{ik} \) is the weight of the knowledge points in the K, the weights of the K knowledge points in the chromosomes of \( C_{ik} \). Knowledge point total error:

\[ \Phi = \sum_{i=1}^{m} \Phi_i \]  \hspace{1cm} (4)

Where \( n \) is the total number of knowledge points. In this system, the usual practice of fitness self testing design for dynamic adaptation is different in the degree of adaptation. The design of the degree of adaptability in the evaluation test paper:

\[ f = 12\Phi + \varphi + 47\gamma + 0.2 \times \xi \]  \hspace{1cm} (5)

In the formula, \( \Phi \) is used to represent the total error of the knowledge points in the chromosome, \( \varphi \) is used to indicate the use of the gene loci and the error of the test time specified by the chromosome,

\( \gamma \) is used to mean the average difficulty of the gene loci in chromosome and the error of the difficulty of the test, \( \xi \) indicates the degree of exposure of each item. In order to effectively put the size error, the proportion of the relevant weight, the weight values of the errors in the formula (5) are obtained in the practical application. It is obvious that the \( f \) value of the gene is smaller, and the higher the degree of adaptation of the gene is[7]. In the practical application of genetic algorithm, if the fitness value of a gene is less than the specified value or the number of iterations, the operation will be terminated and the new chromosome will be generated. For the design of the self testing exercises in peacetime:

\[ f = 12\Phi + \varphi + 47\gamma \]  \hspace{1cm} (6)

\( \Phi_i \) is the dynamic weight error of the knowledge points in the chromosomes, here the introduction of a student knowledge point learning situation assessment weight factor \( Cs \).

\[ Cs = Csp - Csk \]  \hspace{1cm} (7)

\( Csp \) is the average correct rate of knowledge points, that is, the total score of all the candidates and the total score of knowledge points. \( Csk \) is the self testing students in the correct rate of knowledge evaluation process. The ratio of the total score and the total score of the knowledge points in the evaluation. It's not difficult to see, \( 0 < Csp < 1 \), \( 0 < Csk < 1 \). When the self-test knowledge point accuracy is higher than that of the knowledge points average correct rate, \( Cs \) is negative, when the knowledge of students in self correct rate is lower than that of the knowledge the average correct rate, \( Cs \) is positive. The error of certain knowledge points in chromosome is:

\[ \Phi_i = |C_{ik} - C_{ik} + Cs| \]  \hspace{1cm} (8)

Knowledge total error:

\[ \Phi = \sum_{i=1}^{m} \Phi_i \]  \hspace{1cm} (9)

Where \( n \) is the total number of knowledge points. From the above formula can be seen, the weight of the knowledge points in the chromosome can be self testing students' knowledge point accuracy of dynamic change [8].

C. Extensible Security Architecture Modeling

Scalable security computer system's hierarchical structure is shown in Figure 2, the system consists of 3 processors and 3 redundant management units. Processor internal software structure can be divided into three levels of operating system, platform software, application software. 3 hardware circuit boards of redundancy management are physically not completely segmented. In function, the processor completes data processing, state voting and so on, the redundant management unit is the non functional tasks such as output synchronization signal, fault isolation, system degradation and reconfiguration. In general, the processor as a system of data computing and redundancy management computing unit, RM is the execution unit of redundant management [9].

![Figure 2 Architecture of Extendable Safety Computer](image-url)
The application software is the service object of the whole security computing platform, and the system is to provide high reliable data for the application software. The application software refers to the system, or the platform software is transparent to them. Under the protection of real time operating system and security platform software, application software only needs to pay attention to the functional requirements of the application. The platform software is the core of the processor unit and the whole system. It loads the application software in a specific way, which is the core embodiment of the security computer[10].

D. The Implementation Of Interactive Teaching Strategy

The model of interactive teaching strategy is shown in Figure 3.

![Figure 3 Sports Interactive Teaching Strategy Model](image)

Establishing a concept of "taking the student as the center" is the foundation of Interactive Teaching. With the development and progress of modern society, the implementation of lifelong physical education theory has been widely accepted, to make the sport run through the whole life of the people becoming a consensus. In school, the high school physical education should change the backward ideas of the past, to create as many learning conditions mostly take classes in the form of men and women, this is because with the increase of age, the sense of belonging to each other. The establishment of students realize the teachers' identity, acceptance, and the communication in physical education and training, let the students of activity situation should fully mobilize the students' sense of belonging. Sports activities are not a person's activities, the activity situation should have the function of direct design or indirect control of physical exercise. Improving the interactive teaching method of Physical Education is the core of interactive teaching. The core of interactive teaching method in physical education is "interaction", which should make the teachers and students interact in real sense, students need to have an active and active involvement in teaching activities, at the same time, the relationship between teachers and students should be harmonious and relaxed. First, the interactive teaching of physical education should promote the establishment of the "standard" to pay full attention to the specific target of five aspects[11]. These goals are an integral whole, fully embodies the physical and health curriculum is a physical exercise based on the characteristics and physical, psychological, social adaptation of three-dimensional health. Around the schools and teachers in the implementation of the "standard" to pay full attention to the specific target of five aspects, in particular to strengthen on mental health and social adaptation of the two aspects, to promote the realization of the goal of high school physical education curriculum. Reasonably setting up teaching unit is the condition of interactive teaching. Sports interactive teaching quality is closely related to the number of classes in the class. From the current situation of our country, for those more than 60 people in the class to improve the teaching quality of high school sports have great difficulty. Therefore, the interactive teaching of physical education should be carried out in the teaching of small class teaching, which is to improve the quality of education, improving the teaching efficiency of physical education is very important. In addition, the high school sports curriculum that have conditions mostly take classes in the form of men and women, this is because with the increase of age, the difference between the male and female students is becoming more and more significant, such as physical fitness, skills, interests and hobbies, etc [12]. In order to facilitate the teaching of teachers, the usual practice is to put two parallel classes in a row, then two classes of boys is charged by a teacher in the class, the girls by another teacher in class. This approach greatly facilitates the placement of PE teachers' preparing lessons and teaching in high school, which improves the effect of Sports Interactive teaching. Finally, the interactive sports teaching should be based on the students' interests and hobbies. This helps to further stimulate students' interest in sports, and promote students to form the habit of adhering to physical exercise. Improving the interactive teaching method of Physical Education is the core of interactive teaching. The core of interactive teaching method in physical education is "interaction", which should make the teachers and students interact in real sense, students need to have an active and active involvement in teaching activities, at the same time, the relationship between teachers and students should be harmonious and relaxed. First, the interactive teaching of physical education should promote the establishment of appropriate situation. Students in physical education are in the context of direct design or indirect control of physical education teachers, situations should have the function of the students' Sports motivation[13]. Teachers can pay attention to stimulate students' internal motivation in physical education teaching activities. The students of learning goals have an itch for a try mindset and strong desire for success. Therefore, in the organization of physical education, according to the situation of teachers need to elaborate design, let the students through observation, contrast, and experiments to improve their participation in the activities of the motivation. The creation of physical activity situation should fully mobilize the students' sense of belonging. Sports activities are not a person's activities, the characteristics of high frequency of interpersonal communication in physical education and training, let the students realize the teachers' identity, acceptence, and the sense of belonging to each other. The establishment of
specialized physical education teachers is the key of interactive teaching of physical education. Only by improving the overall quality of teachers, it is possible to improve the teaching quality of physical education [14]. The special nature of physical education and its own characteristics make the teachers face greater challenges. Physical education teachers should guide students to study independently and cultivate students' self-learning ability and skills. Self-study ability is a key link to decide the quality of education. To cultivate students' self-study ability requires teachers to implement the "far" principle in the process of face, leaving them the space to think. Teachers must master advanced teaching method, to meet the requirements of the modern network information, society teachers should have the knowledge structure development, improve the teaching efficiency of physical education and adapt to the transformation of modern teaching mode. In addition, the stable and high level of physical education teachers is a long-term strategic choice in the construction of physical education teachers. The school should strengthen the new knowledge, new ideas and training of physical education teachers, physical education teachers should consciously study the psychological characteristics of students, and the teaching of physical education, research is suitable for students' physical education teaching method, so as to get rid of the traditional teaching mode of physical education, and improve the quality of interactive physical education [15].

III. RESULTS AND ANALYSIS

Self-efficacy scale was used to refer to the national men and women (that is, the national college students' GSES score was 2.69 + 0.57 and 2.55 + 0.53), the average number of modified one standard deviation for the selection of high self-efficacy group and low self-efficacy group, a questionnaire survey of 2011 grade and 2010 grade sports masters in a normal university, GSES score is higher than a standard deviation (more than 2.69 + 0.57 and 2.55 + 0.53) for high self-efficacy group, GSES score is lower than a standard deviation (less than 2.69 + 0.57 and 2.55 + 0.53) for low self-efficacy group, others are general efficacy groups [16]. A comparative analysis of the performance of students in the interactive teaching experiment is carried out, and the results are shown in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Comparison of Students' Self-Efficacy Before and After the Experiment</th>
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<tbody>
<tr>
<td><strong>Experimental group pre-test</strong></td>
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<td><strong>High self-efficacy group</strong></td>
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<td><strong>Low self-efficacy group</strong></td>
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In the experimental group, the number of high self-efficacy group increased from 9 to 16, the proportion increased from 23.2% to 13.7%, that is, the number of people has been greatly improved. The number of boys in the general effectiveness group decreased from 55 to 50, the proportion decreased from 79.8% to 72.5%, a slight decrease. The number of low self-efficacy groups is from 3 to 5 people to 3 people, the proportion dropped from 4.3% to 7.2%. Through the change of the number and proportion of the trend can be seen in interactive teaching mode, the number of high self-efficacy group has been greatly improved, at the same time, the number of low self-efficacy group also has a certain decline, the interactive teaching method has improved the students' self-efficacy. In the experimental group, the interactive teaching mode, and the learning process, students exchanges, cooperation, and avoid weaknesses, continue to explore with teachers, to enrich and improve their own knowledge, students are more confident in themselves [17]. So the experimental group in the post-test, the number of high self-efficacy group increased significantly, and the number of low self-efficacy group decreased.

IV. CONCLUSIONS

With the development and popularization of computer technology, computer platform has been applied to interactive teaching of physical education. This paper analyzes the feasibility of interactive teaching, an interactive teaching strategy model is established based on the theory, the implementation approach of the teaching strategy is put forward. Interactive teaching mode can promote the students' self-efficacy in a certain degree, and have a greater role in promoting physical education.

REFERENCES


