Application of Modern Information Technology to Physical Education

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ABSTRACT. *Modern information educational technology (IET) will be gradually applied to school education, which will lead to the changes in educational ideas, forms, content and methods. The technology can be widely used in Physical Education theoretical and practical courses. The application of IET to PE will have some advantageous impacts on PE, such as: optimizing the teaching environment, improving the quality of teaching; helping teachers explain the model with maneuvers, highlighting the difficult and important points of the maneuvers, promoting teaching efficiency; creating classroom situations, stimulating interest in learning, developing good qualities in sports and so on. Therefore, the paper proposes to improve the capabilities of the PE teachers of using computers and the network technology, to increase the construction of hardware facilities, and to strengthening the development and promotion of the PE teaching assistant softwares.*

KEYWORDS: *information technology, educational technology, PE teaching*

1. Introduction

Modern information educational technology (IET) is a product of the application of the modern technology to school education, which is the use of computers as a teaching medium to achieve the teaching purpose through students' interaction with the computer. Compared to the traditional classroom teaching, the computer-aided PE teaching is vivid, lively, and easy to be accepted. It helps to understand some difficult macro and micro concepts and some special phenomena and things, so as to improve the teaching effect. Therefore, it is an important aspect of reform in Physical Education in the 21st century.

Because physical education is an important component of quality education, to meet the needs of the times, it is necessary to build an open network platform for physical and health education, constantly absorbing the latest information to meet the social development in order to overcome the drawbacks of the traditional mode of education. The concept of the new curriculum standards in strengthening the application of information technology to PE teaching and breaking the old rigid teaching model will build a good foundation for exerting students' initiative and creativity, which will lead the PE to developing in a modernized direction. The study on the application of IET to PE teaching aims at changing teachers' educational ideas, optimizing classroom structure, improving teaching methods, promoting teaching efficiency. Further, the paper explores ways to developing teachers and students' qualities in using the information technology in class and speeding the reform of school education in the information age, so that a new teaching mode will be constructed and the information technology will be more applied in teaching PE.

2. Theoretical foundations

The information technology (also known as information and communications technology), is mainly used to design, develop, install and implement information systems and utility softwares by using computer science and communication technology, including sensor technology, computer technology and communication technology. Currently, what is applied to PE teaching is the information technology used computer technology as the core, including multimedia computer, classroom networks, campus networks and the Internet, etc. [1] The American Association for Educational Communications and Technology (AECT) defined the educational technology in1994 as the theory and practice of designing, developing, using, managing and evaluating   learning resources and learning process. This definition clearly points out that the object of study of educational technology is the learning process and learning resources, and the technology, based on modern educational theory and learning theory, is characterized by focusing on both theory and practice. It aims at deepening teaching reform,

optimizing teaching resources and teaching process, so to improve teaching quality. In the past, Chinese traditional PE teaching used speeches, texts, pictures, models, blackboards and chalk as the media, and then developed photographs, slide projection, films, television as the media, and now is stepping into a modern information phase [2].

Therefore, IET is the application of information technology to teaching. Namely, in teaching, teachers may use the advanced technologies and equipment such as slides, films, audios, videos, projection, television, laser disc, computer, multimedia , satellite education, remote information network as the teaching media, applying some teaching methods, including inquiry approach, collaborative method, creation approach, elicitation method and other ways to implement an individualized and hierarchical teaching[3]. The application of IET to PE teaching will lead the study on PE teaching reform to a new direction. With the development of technology, the application and development of IET in PE teaching will be bound to change the traditional teaching mode, teaching ideas, designs, methods, and interactions, which will lead the PE teaching reform into a great-leap-forward development.

3. IET and PE teaching

PE teaching is an educational process, in which teachers in accordance to "Standards of Sports and Health Course" and school physical educational program, teach students knowledge and techniques, and train them physically, mentally and morally. The process involves both teachers' guidance and students' participation. The characteristic of PE course is that most of sports events are undertaken outdoors. The students, only in the teacher's explanation and demonstration and through their repeated practice, can acquire knowledge and master new skills to exercise and invigorate health effectively; IET is a new teaching resource. If used properly, it will certainly optimize the physical education environment, improve the quality of physical education, and gradually realize dynamic exchanges of information between teachers and students to form a learning community [4]. To some extent, the technology has an impact on the development of physical education. It influenced almost every aspect of PE, and the reform and innovation of PE involves the information technology. So PE teaching and the information technology depend on each other and promote mutually.

4. Benefits

As for PE, the IET is mainly used in PE theoretical (indoor) and practical (outdoor) courses. Compared to the traditional teaching, the present PE teaching with the help of the information technology, not only may be undertaken through multimedia coursewares to give basic PE knowledge and health care lessons, but also review sports or film materials, and even have online PE courses. In PE practice, the application of IET in PE can help teachers optimize the movement model, decompose the complex movement structures, reduce the time involved in organizing and explaining the exercises, so as to improve the teaching efficiency and increase visual and audio effects. In the favorable situations, students tend to grasp the important points quickly and understand the difficult points better, which is bound to develop students' problem-solving abilities.

4.1 Optimizing the teaching environment, enriching the teaching resources, improving the quality of teaching

IET provides the teaching means with a modern model of the framework. Its idea is based on the computer as a carrier of storing and transmitting "digital" teaching content, and on the "network, "" intelligent "information technology as an efficient drive to the carrier of the teaching content [5]. In the traditional teaching, teachers mainly teach students the knowledge and skills through speeches, body language, and facial expressions. And teachers have to try all means to create an attractive learning environment to arouse students' enthusiasm in study. But the "digital" technology helps us realize a multimedia teaching mode with the content of pictures, sounds, videos, animations, texts, etc. This is fresh to students, and is easy to keep their interest in learning. Besides, the use of IET will certainly have a good teaching result. In the traditional teaching, teachers only can get access to the limited teaching resources such as professional books and reference books. In contrast, the internet enables us to share enough teaching resources with others, which reduces the distance between people and extend the transmission of information [6]. People only can see the charm of sports in pictures and equipment in a traditional PE teaching. While a new multimedia educational software will optimize the school physical education environment, and better coordinate the interactions between teaching and learning.

4.2 Making up the teaching content for the teachers affected by physical conditions

In traditional PE teaching, teachers mainly exemplify the exercises to help students learn through listening and watching. Thus it has a high demand for teachers' professional knowledge as well as their sports skills, which will directly affect the teaching effects. In fact, with the development of teaching materials, teachers are faced with variety of sports and new sport rules; they meet lots of challenges in their teaching. In addition, with an increase in age, many teachers have a decrease in efforts and energy, and the physical fitness began to decline. As a result, some teachers arrange for the limited sports which are simple or they excel in. Gradually, the teaching content will be single and simplified, which will seriously affect the overall development of students. But, with the application of IET to PE teaching, most of the problems will be solved easily. Teachers may download, purchase or produce some teaching softwares to give students vivid demonstrations. In this way, teachers can save more time, and they need not to explain as they demonstrate, which is difficult for one to do the both at the same time. By using of multimedia in class, teachers can appropriately analyze the teaching materials, figure out the difficult and important points, and choose proper teaching methods to improve teaching efficiency.

4.3 Improving students' problem-solving abilities

IET has combined the audio-visual features of television with the interactive features of computer, which will produce a new communicative way full of colorful pictures and texts. And by watching some different sports techniques, difficult exercises and wrongly played movements, students will raise, analyze, and solve problems, in which they will certainly improve their problem-solving ability. In this process, teachers mainly play a role in fostering students' capabilities of finding information-dealing ways and of solving problems. And the class will shift from a teacher-centered class to a student-centered one. Students' initiatives will be exerted to the great extent.

4.4 Creating the ideal teaching environment and stimulate learners' interests

It is well-known that interest is the best teacher. Interest is a kind of attitude towards choosing objective things, and is a positive psychological tendency to understand a matter or participate in an activity. It is an intrinsic motivation to learn. American educator Bruce said: "The best stimulus of learning is the interest in learning materials." Chinese educator Confucius once said that "knowing is no better than loving, and loving is no better than enjoying." That shows the great power of interest [7]. As teachers, they should fully exploit the interest points and the artistic charm in teaching materials, and reasonably use IET teaching methods to match learners' curiosity and psychology. Thus it will create a better learning situation and pleasant mood, in which the learners' enthusiasm will be spurred, so as to develop good sports accomplishment.

4.5 Cultivating students' practical and innovative capacity

IET, as a new teaching assistant tool and resource, has changed the teaching process and classroom teaching structure. Teachers may take full advantage of the quantitative and various multimedia resources and distance education resources provided by network. The teaching process will focus on stimulating learners' interests and initiatives, combining study and exercise together, and encouraging students to obtain information from the internet to improve the capability of reforming, restructuring and recreating, in order to improve their information literacy [8]. Teachers can also use modern means of information technology, to find relevant information.

4.6 Realizing a dynamic information exchange between teachers and students to form a better learning community

The outstanding features of the information education age are openness and without time or space limitations. PE teachers should stand in the van of the developing era to keep pace with the times, concerning the latest professional knowledge. Also, they should change the old teaching notions and reform teaching methods as well as teaching modes by using of IET, so that they can create an efficient PE class, in which they will consider the individual differences among students and help them play the main role in their study. On one hand, students may acquire knowledge and exercising techniques under teachers' guidance; on the other hand, they may make good use of the wealth of information from the network resources to enrich their minds. With widespread access

to IET, the multi-directional transmission of information will occur between teachers and students in PE teaching. An increase in information communication and exchange between them will ensure to form a better learning community.

5. Application

5.1 Application of IET in PE Theoretical Courses

5.1.1 In improving teaching methods and system

IET can transform the teacher explanation and demonstration on computer. In a vivid analysis and different-speed presentation, pictures, videos and animations can be applied alternately in teaching, which will greatly facilitate to demonstrate the teachers' teaching ideas, and will develop the advanced teaching thoughts in the process.

5.1.2 In inspiring students' enthusiasm for learning and broadening their horizons

Teachers should excavate the interest factors and artistic charm in teaching materials. By using multimedia softwares in teaching, students' desire for knowledge and interest in learning will be aroused and they will study actively. That is the purpose of "edutainment" [9]. The traditional PE theoretical courses mainly depend on teachers' explanations, combined with students' practice, in which students' listening is very important, and in a way, they study passively. However, due to the novel and more vivid expression of IET, as far as students are concerned, obtaining PE theories is no longer a passive process, but an active exploration. Therefore, they, with more interest, will be willing to make efforts to study. Meanwhile, acquiring knowledge rapidly not only is beneficial to develop students' initiatives and creativities, but also to help them form their own learning system. Besides, the assistance of computers will help to increase teaching contents as well as information density, so as to improve teaching efficiency. By applying the storage function of computer, teachers may present any related information, pictures or sounds to students to help them get access to more knowledge out of textbooks or in the frontier of the field.

5.1.3 In promoting the learning results and quality

The application of IET to PE, to some degree, will change the theories into perceptual knowledge, which is helpful for students to understand some difficult points. For example, in order to give the lesson about "hiking and orienteering," teachers may rely on IET to show students some videos or pictures of domestic and international orienteering activities, in which they also will sense the beauty of nature, so that they will have yearning for nature. In this way, they will have an interest in hiking and orienteering activities.

5.1.4 In speeding the update of knowledge

One of the features of IET is convenient and flexible. The modification of information can keep pace with times. Teachers may learn and preach the latest information both at home and abroad. Connected to the internet, they will enrich their information and knowledge.

5.2 Application of IET in PE Practical Courses

The application of IET in PE teaching gives a huge advantage to some practical courses like Track and Field, Gymnastics, Martial Arts, and ball games, etc. Students can witness the mechanical movement through the animation, so they will have a deep understanding about of sport principles, and can correctly remember the action essentials. Their hard-working practice, plus teachers' guidance, will ensure them to make progress in mastering the sports techniques.

5.2.1 Individualized instruction to individual

Because of the intellectual, physical, and sport basis differences, the phenomenon of "too little" and "too much" content in the traditional teaching will be changed into positive with the application of IET in teaching. Students may choose different content and speed to practice according to their own capabilities. Compared to the model, students can analyze their errors and shortcomings, so that they will modify and make progress. This is a full reflection of the theory of individualized instruction to individual.

5.2.2 In enlivening classroom atmosphere and increasing student interest in learning

One of the tasks of PE teaching is to enable students to master certain sport skills, and on this basis, enable them to flexibly apply and create new sport techniques. The formation of a new maneuver always depends on listening and seeing to sense the technical process. And seeing is the major source of information for students. Because IET has achieved a combination of vision, hearing, audio-visual, and movement, which turns the used-to-be dull techniques into more lively visual images. So students will show a desire for learning, and will play the main role in study. According to the investigation of experts, the students who get access to IET are more interested in study than those who do not [10].

5.2.3 In standardizing sport movements

By using animation and videos in teaching, PE teachers may use slow movement, stop or repeat the movement, together with explanation and model. That can help students see the technical details of movements at each moment. Teachers can explain the essentials of the decomposition of the action, demonstrating the movement of the whole process, and then focusing on the critical parts of the action. Thus, it will reduce students' cognitive phase, and will also shorten the teaching process, finally improving the teaching efficiency.

6. Conclusion and suggestions

The application of IET to other subjects has opened up a new way of thinking for PE teaching. Compared with the traditional teaching, it has incomparable advantages, such as shortening teaching time, increasing vividness, improving teaching efficiency, promoting students' physical and mental health, warming classroom atmosphere, and stimulating learning interest, etc. It is one of the most effective means to optimize PE teaching. In the future development, it may follow the next suggestions:

6.1 To improve PE teachers' capabilities of using computers and network

To promote the application of IET to PE teaching, on one hand, it is necessary to train PE teachers in using computers. That will pave the way for spreading the technology. On the other hand, some backbones should be cultivated to support IET, so that it will prevent the unbalance between personnel equipment and hardware equipment to avoid a waste of resources, which will encourage the government to invest more money on PE computer-aided teaching.

6.2 To increase the investment on hardware facilities

All level of educational departments should explore a system that suits the characteristics of present PE teaching to equip it with both hardwares and softwares. At the same time, the government should strengthen the construction of the network, and provide the PE teaching with material and technical support. It will certainly guide and push PE teaching to go ahead.

6.3 To enforce the exploration and spread of PE computer-aided teaching softwares

The exploration and spread of PE computer-aided software should mainly rely on software companies, supplemented by physical educators and front-line teachers as counselors. So that they will develop some universal supporting softwares to meet PE teachers' needs.

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