

Research Article

A Study on Application of CAI Dynamic Image-Guided Method in College Physical Education Technical Course

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Abstract: In this study, we have a study on application of CAI dynamic image-guided method in college physical education technical course. In college physical education teaching, the Computer-Assisted Instruction (CAI) dynamic image-guided method is employed to build the sport image diagnosis and implement 2-way feedback mechanism. This is for helping the students to create or modify the sport image, and strengthen the concept of action to set up the correct technical dynamic stereotype. The practice of teaching proves the excellent efficiency and feasibility of the application of CAI dynamic image-guided method in physical education teaching. In our research, with the advantage and features of CAI technology, the application in college physical education will improve the teaching quality, increase the students' study interest, and reach the better teaching result with less effort.

Keywords: Application, college physical education, Computer-Assisted Instruction (CAI), dynamic image

INTRODUCTION

Nowadays, the innovation for teaching methods is ongoing, and to employ the multimedia and networking technology for teaching is one of important trend in the education reform. To face the great impact from rapid development of science and technology in the information society, the college physical education teaching should be involved with the high technology and latest knowledge to follow the development trend of this era, and with all kinds of information sources to boost the education innovation of the teaching method for college physical education. Therefore, much effort on development of Computer-Assisted Instruction (CAI) courseware should be devoted for teaching technical course in college physical education. With the advantage and features of CAI technology, the application in college physical education will improve the teaching quality, increase the students' study interest, and reach the better teaching result with less effort. Zhao (2000) have a research of the application and development of CAI courseware for volleyball optional course. Liu (1999) study the application of action image training for the volleyball spike teaching. Yao (2007) make a guess on the application of multimedia dynamic image-guided method in volleyball technical teaching in physical education colleges. Liu (2007) have the study of the functions of township government under the perspective of governance. Sheng (2007) have a research of the contents and path selection of the transformation of township government function in the new period. Du (2008) analyzes the transition of township government function's restriction factors and breakthrough.

In this study, we have a study on application of CAI dynamic image-guided method in college physical education technical course. In college physical education teaching, the Computer-Assisted Instruction (CAI) dynamic image-guided method is employed to build the sport image diagnosis and implement two-way feedback mechanism. This is for helping the students to create or modify the sport image, and strengthen the concept of action to set up the correct technical dynamic stereotype. The practice of teaching proves the excellent efficiency and feasibility of the application of CAI dynamic image-guided method in physical education teaching. In our research, with the advantage and features of CAI technology, the application in college physical education will improve the teaching quality, increase the students' study interest, and reach the better teaching result with less effort.

THEORETICAL BASIS

The sports psychology believes the beginning of sports technical study is to understand the learning object and create the target image. Target image refers to the reaction for the target model and action mode of the problem-solving for the learner, to create image in the brain, that is, to understand the target model for solving problem. In the beginning of study, the learner observes the demonstration of the action to stimulate the perception and create the inner action image as reference for the practice. In the physical education teaching, the students follow the action image created in their brain to practice the action.

In the traditional teaching method for physical education technical course, normally the instructor

demonstrate the action (to create the action image in the students' brain initially, and to establish the concept of the action step by step), and the students practice with imitation.

Instructor strengthen the right action and point out the wrong one (to correct the wrongs and unclear action images and concepts), and the students practice repeatedly afterward, until the skill is learned and correct dynamic stereotype is created. In this teaching method, the demonstration of instructor is very important for the students to create the correct action images. However, the demonstration of instructor depends on several factors, for example, in the demonstration of difficult skills including jump shoot in basketball or spike in volleyball, most instructors could not demonstrate the standard action perfectly and completely after the jump height and action speed are affected by the worse condition of instructors' physical fitness due to their aging, also too many parts of the action are finished in very short time due to the fast speed and strong continuity and this causes the students miss some details of the action while observing. Also, the large number of students in current class and the long line-up limit the students' position for observing, so it is impossible for the students to observe the completed action demonstrated by the instructor from all angles and different height. This causes the blind area for observing (or blind point) for students, so they can only catch some part of the action details, which is not good to create clear and completed action image in their brains and to establish the correct action concept. Meanwhile, whether the students have created correct action image during teaching is difficult to feedback to either themselves or instructor. Furthermore, the instructor could not control the teaching progress if he was not sure whether the students have created action image in their brains, or the image existed is clear, completed and correct. Also, the students would create the wrong dynamic stereotype if they couldn't judge and correct the wrong action image created in their brains. Therefore, to help the students creating the completed, clear and correct action image quickly is a very important issue in the physical education technical course. The physical education researchers have studied in the teaching method for many years to solve this key issue. The CAI multimedia dynamic image-guided method is discussed here to assist the students to create the completed, clear and correct action image, and to master the technical skills correctly. Eventually, it will provide the resolution to solve some practical problem in the physical education technical course.

APPLICATIONS

Design and produce of CAI dynamic image courseware for physical education technical course:

The set shot in basketball is as example. At first, the well-selected knowledge points are typed into the computer with Word 2000 or other software for text-editing, to create the textbook for the skill of set shoot; secondly, the demonstration of original front-dunk is recorded using camcorder, video-taper and scanner; then use some software tools, e.g., Photoshop 7.0, Premiere 5.5, Flash MX, 3D Studio Max 3.0 and etc., to create the multimedia materials for the textbook of the set shoot, including images, cartoons for technical skills and video movies; at last, record the audio for the textbook through microphone. Based on the theoretical basis and principles of system design, this study chooses powerful Author ware 6.0 and Flash MX as developing tools for the multimedia textbook. The teaching content of textbook and teaching strategy is refined, and the script of the display method for screen information, interactive study and processing control of study is carefully designed. In a multi-level framework structure and navigation mode, the technologies of hypertext and multimedia, Active Plug-in and object-oriented system integration programming with classification module are used to create a CAI dynamic image-guided textbook for set shot skill, which is dominated by students with true-like classroom-teaching combined with active images, texts and videos.

Structure design of CAI multimedia courseware for physical education technical course: The structure of the courseware program is designed with Up-Bottom structural module, and modular of the operation on the bottom level. According to the content of physical education technical course, make the program menu in the form of outline. There are 3 levels for the courseware: first level is main menu, listing the main titles at choice: fundamental of volleyball, basic skills, basic strategies, and etc.; each title has more subtitles at choice, which are corresponding to different contents of the course. Main menu controls the running of whole program, and the submenu controls the switch between the chapters and return to the upper level of program. Each chapter has certain amount of quiz, which are for the students to review and practice of the knowledge and skills. Specially, classic match videos are added into the main menu, to increase the students' study interest.

RESULTS AND ANALYSIS

Experiment method:

Experiment object: The experiment object is the 60 students in Jिंगgangshan University, who are in the class for optional basketball course. The students are selected randomly and put in two teams, one as experimental and other as reference, which are 30 for each team.

Table 1: The result from experimental and reference teams for basketball skill

	Team	Mean difference	t	p
Result-score	Experimental-reference	5.23	3.467	<0.05
Standard reached-or-not	Experimental-reference	3.32	2.482	<0.05
Total score	Experimental-reference	8.56	3.136	<0.05

Experiment design and control of experimental condition: This study chooses two rounds of “mono-blind” experiments and the design to compare two teams, to exam the difference of teaching result for each team, and test the effect of different teaching method. To avoid the system difference between the teams before experiment, which would influent the inside effect and the reliability of experiment, the students in experimental team and reference team are averaged on the factors of age, height, physical fitness, theory and technical score of basketball and other related issue. This will make the roughly equal for the non-experimental factors in the teaching, and more reasonable for different team to meet the requirement of experiment.

Analysis factor for experiment: The traditional teaching method is used for the reference team: as dominant in the class, the instructor demonstrates with comment and organizes the students to learn and practice. For the experimental team, the instructor uses multimedia CAI dynamic image-guided method to assist the teaching besides of the traditional teaching method. The teaching content and instructor is same for both teams, the teaching time is 16 academic h.

Exam factor for experimental results: The basketball skill will be tested for each student after class study, and the exam factor is score and standard reached-or-not.

Experiment results: After experiment, the students from both teams are assessed for the basketball skill. The result from Table 1 shows that there is quite big difference for the score between two teams, and the students in experimental team are much better than those in reference team. This result proves that teaching effect for CAI dynamic image-guided method in physical education technical course is very good.

ANALYSIS AND DISCUSSION

CAI dynamic image-guided teaching could increase the students’ study interest: In the college, the body and mind of students are matured, and their psychological and behavior activity becomes self-controlled and self-regulated from imitating, following and controlled by outside. In college physical education technical course, multimedia dynamic image-guided method could overcome the disadvantage of traditional

method, which is passive study for the students only to imitate with few study interest and less study positivity, and is easily affect by the instructor’s demonstration. Multimedia technology including texts, audios, graphs, images, multi-dimensional cartoon with special effect, video movie and replay with slow motion displays the dynamic content of textbook for the students with strong sensory effect to attract their attention to study, which is helpful to understand and learn the physical education skills.

CAI dynamic image-guided method could help students to create clear, correct and completed action image: In the physical education technical teaching, multimedia technology including multi-dimensional cartoon with special effect and video movie, could display the important technical parts of teaching content with slow-motion, replay and pause, to show fully the spatial and temporal characteristics of the sport skills and the relation. This makes the demonstration of each step of the skill more precisely, clearly, eventually to create the clear, correct and completed action image through repeatedly stimulation after high-frequent strengthening and repeatedly stimulation. Meanwhile, the feedback mechanism for action image could make the students promptly realize and correct the wrong action image caused by the imperfect demonstration of the instructor due to their age and worse of physical fitness.

CAI dynamic image-guided method could help the students to remember the technical part of skills: Human being acquires information from the outside through perception, and store in the memory with accumulation for the later use. When the stimulation from outside takes effect on the sense organ to create sense impression, and then create sense memory. The sense impression from sensory is called visual memory, and sense impression from hearing called audio memory. The size of audio memory is less than video memory. In the traditional teaching method, the instructor’s demonstration is too fast and the comment could not be repeated too much, so it is not easy for students to remember. While in dynamic image-guided method, the guide by dynamic image with the videos and audios can stimulate the students’ sensory and hearing repeatedly, to strengthen the sense of the action processing. This is very helpful to increase the students’ ability of memory.

CAI dynamic image-guided method could play vivid, specific and intuitive function: In the physical

education technical course, CAI dynamic image-guided method could employ the videos and multidimensional cartoon with special effect to show fully the spatial and temporal characteristics of the sport skills and the relation with all aspects and angles, as an intuitive teaching method. It can dynamically simulate the whole processing of the action in different speed and repeat times spatially and temporally, and make the short processing of the action located in space and expanded in time, to explain the phenomenon and mechanism which is not easy to directly observe for students from the inner of the matter. This is very helpful for students to master the correct spatial and temporal concept of the action based on the intuitive information and to understand the principle of the sport skills better. The teaching with this kind of high level intuitive method is more precious and standardized than the presentation by chalk-writing, hanging-chart or projector.

CONCLUSION

In the college physical education technical course, to use the CAI dynamic image-guided teaching method appropriately could demonstrate and present the spatial and temporal characteristic of the action in all aspect and full angles with multimedia technology to make the demonstration of all steps of action more precisely, realistically, clearly and standardized. This could help the students to create clear, correct and completed action image based on the intuitive information, and master the correct concept of technical action to create the correct dynamic stereotype, eventually achieve the

objective to increase the teaching quality. Also it could optimize the teaching processing, speed the students' study to the sports skill, and the teaching effect is much better than the traditional method. Therefore, in college physical education technical course, the development and application of computer multimedia courseware should be paid much attention, also devote the much effort to develop the CAI dynamic image-guided method to increase the teaching efficiency and quality.

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