Design and Development of CAI Courseware for Basketball Teaching of Physical Education Specialty

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Abstract. Computer aided instruction (CAI) information technology is an important part of subject curriculum integration, and multimedia courseware is the main means to realize CAI. At present, multimedia courseware is gradually becoming an indispensable tool for teachers' teaching and students' learning. Like podium and blackboard, it has become the infrastructure of college teaching. Through the development of Basketball Teaching CAI Courseware for physical education specialty, this paper discusses the development of Basketball Teaching CAI courseware. Combine the traditional basketball teaching methods with computer-aided teaching technology to improve the teaching effect of basketball technology course. Through teaching experiments and expert evaluation, the practical value and popularization value of the development of CAI Courseware for basketball players' special physical quality training are verified.

Keywords: Basketball teaching · CAI courseware · Courseware design

1 Introduction

With the rapid development of modern education, multimedia CAI technology has become the commanding point and breakthrough in the reform from exam oriented education to quality education. It is also a strategic measure to improve teaching quality, expand teaching scale and establish a new education and teaching system. Multimedia teaching has become the basic direction of teaching reform in Colleges and universities in China. It will become an inevitable trend of teaching reform in the new century and will play an increasingly important role in the implementation of quality education.

At present, most physical education colleges and departments still focus on Teachers' oral instruction in the teaching of sports technology theory. The teaching contents such as technical actions and tactical forms are basically demonstrated to students by some simple teaching media such as chalk, blackboard and teaching wall chart. Because teachers are restricted by objective conditions such as age, gender, physical quality and teaching environment, it is difficult for teachers to demonstrate technical actions and tactical changes for students in the teaching process. The transmission of teaching information between teachers and students is mainly Abstract professional terms. It is

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difficult for students to correspond this theory with sports technology practice, It is difficult for students to establish correct technical movements and technical and tactical modes according to teachers' explanations [1]. Using multimedia CAI Courseware for auxiliary teaching has important practical significance for improving students' learning interest, promoting the formation and improvement of students' sports skills, expanding students' professional knowledge, improving teaching methods, highlighting teaching priorities and teaching difficulties.

The application of multimedia technology in basketball teaching is conducive to the reform of the concept and form of basketball textbook compilation; It is conducive to the reform of basketball courseware teaching system plan and teaching management mode; It is conducive to give full play to students' initiative and improve their interest in learning; It is conducive to students' better acquisition of knowledge: it is conducive to enriching learning content; It is conducive to facing all students and developing personality; It is conducive to better preservation of data. As shown in Fig. 1 below, multimedia basketball physical education teaching is in progress.

Fig. 1. Multimedia basketball physical education

For a long time, the teaching of basketball course for Physical Education Majors in Colleges and universities has followed the missionary mode of explanation, demonstration, practice, correction and re practice. This teaching model is conducive to teachers' teaching, but ignores the individual differences of students, limits the exertion of students' subjective initiative, and makes the classroom learning atmosphere dull. With the improvement of social requirements for talent training in Colleges and universities, we should reform teaching accordingly to meet the social needs for talent training.

Based on cooperative learning theory, this study explores new methods of basketball teaching. By consulting relevant materials, this paper studies the current situation of basketball teaching, cooperative learning theory and basketball teaching theory of Physical Education Specialty in Colleges and universities. Design and implement the basketball teaching experiment of cooperative learning. After research and analysis, the following conclusions are finally drawn:

1. The application of cooperative learning in basketball teaching is feasible and can significantly improve students' basketball skills.
2. Cooperative learning has greatly improved students' learning enthusiasm, and students have changed from passive learning to active learning.
3. Cooperative learning recognizes the differences among students, and sets corresponding learning objectives according to students' specific conditions in teaching practice, so that students can achieve learning objectives within their own ability.
4. Cooperative learning helps students understand the rules of basketball, stimulate their interest in learning, and pave the way for students' further learning.

The introduction of cooperative learning theory into the teaching of basketball course of physical education major in Colleges and universities has changed the single teaching form of teachers' explanation, demonstration and correction of errors in the past classroom, and students' observation and imitation practice [2]. A fair and democratic learning atmosphere has been formed in the classroom, which reflects the leading role of teachers and the dominant position of students, and forms a gratifying situation of teacher-student interaction and student-student interaction. The new curriculum standard of primary and secondary school physical education and health requires primary and secondary school students to learn cooperative learning. As the future primary and secondary school physical education teachers, the students of physical education colleges and departments should naturally learn the methods and Strategies of cooperative learning to prepare for becoming a qualified primary and secondary school physical education teacher.

2 Design of CAI Courseware

2.1 Theoretical Basis of CAI Courseware Design

Modern information technology, characterized by multimedia, networking and intelligence, is having a profound impact and transformation on the traditional curriculum concept, curriculum content, curriculum implementation and curriculum resources. It is to integrate information technology as a tool into the organic whole of the subject curriculum and become an integral part of the curriculum, so as to make all kinds of teaching resources, teaching elements and teaching links integrate with each other through the arrangement and combination of information technology tools, so as to achieve the overall optimization.

CAI courseware is essentially a kind of computer application software. Its development process and method have many similarities with general software engineering, and have many commonalities in the development of general multimedia projects. However, because CAI courseware is a kind of teaching software, its purpose is to enable learners to complete the effective learning of teaching content through the operation of courseware. Therefore, it is different from other types of multimedia application software in many factors such as content selection, structure organization, control strategy and interaction characteristics, so its development and implementation method has some uniqueness.

(1) Behaviorism learning theory and CAI courseware design. There are also different research frameworks and explanations of learning in the school of behaviorism theory, but they all have an important common feature: they think that learning is the connection between stimulus and response. Regard the external environment as a stimulus and the accompanying organic behavior as a response. Therefore, the research object turns to the external expression of psychological activities - "behavior", and holds that psychology is a science of behavior. Therefore, the theory of this kind of faction is called behaviorism theory.
(2) Cognitive learning theory and CAI courseware design. In the design of CAI courseware, people begin to pay attention to the internal psychological process of learners, and begin to study and emphasize the psychological characteristics and cognitive laws of learners; Learning is no longer regarded as a passive adaptive response to external stimuli; Instead, learning is regarded as a selective information processing process that learners actively make on the information provided by the current external stimuli by using their original cognitive structure according to their own attitudes, needs, interests and hobbies [3]. The famous scholar who applied cognitive learning theory to CAI in this period was Anderson. In the early 1980s, he proposed an adaptive control of thought (ACT) based on cognitive learning theory. This method emphasizes the control process of advanced thinking and tries to reveal the control mechanism and control principles of thinking orientation and thinking transfer. Anderson applied this method to build a cognitive student model, In order to realize the automatic tracking and control of students' thinking process of solving geometric problems, and achieve great success.

2.2 Basic Principles of CAI Courseware Design

At present, the biggest contradiction in the teaching of domestic colleges and universities is the contradiction between curriculum content and class hours, that is, more courses, more content and less class hours allocated. Now this contradiction is more prominent. For example: in the past, 102 class hours were allocated for the classical part and the modern part of the course of automatic control theory; Now, according to the new teaching plan, the second part - the total allocated class hours is only 72 class hours.

The teaching content remains basically unchanged, but the class hours are greatly reduced, which is very common in Colleges and universities. On the premise of ensuring teaching quality and not increasing teaching hours, to solve this increasingly prominent contradiction is to use basketball sports multimedia teaching technology to assist teaching. Practice has proved that using basketball sports multimedia teaching technology to assist teaching can save nearly one-third of class hours compared with traditional teaching methods. As long as teachers carefully prepare, reasonably arrange the content and highlight the key points when making multimedia teaching manuscripts of basketball physical education, students can fully accept them. The use of basketball sports multimedia teaching technology to assist teaching will make teaching more lively, students' interest in learning will be improved, they will pay more attention to the teaching content, and the learning efficiency will be improved.

Teachers don't have to waste time on writing blackboards and drawing pictures in class. The saved time can explain more contents and demonstrate more examples; It can even leave some time for students to do classroom exercises, digest the contents of classroom learning, enhance students' memory of learning contents, and solve some difficulties that are easy to cause students' questions [4]. The effect is very obvious. Students don't have to take too many notes, because teachers can easily put E-teaching manuscripts in a mailbox. Teachers tell students the email address and password. Students can enter the mailbox for review and review at any time. If necessary, they can also easily download them for students' further study.

In addition, students can also put their questions in learning and their opinions on Teachers' teaching in the form of e-mail. Teachers can choose the form of answer according to the universality of questions, and make appropriate reflection and correction on their opinions on teaching. This will increase the interaction between teachers and students, which is undoubtedly beneficial to teaching and learning. Teachers should stand at the forefront of the use of advanced technology and apply computer basketball sports multimedia teaching technology in teaching, which can not only improve the efficiency of teaching work, but also improve teachers' computer application skills, and inspire students, which will inevitably enhance students' confidence and determination in the application of computer Basketball Sports Multimedia teaching technology.

(1) Scientific and educational.
Any multimedia CAI courseware must first follow this principle. It requires designers to design multimedia CAI courseware according to the course content and students' physical and mental characteristics [5]. The specific requirements are that there should be no mistakes in knowledge, skills and professional terms in the courseware: the depth and breadth of the content covered should be appropriate; The order of appearance should be logical; The nouns used should be consistent; Words and pictures shall be readable; The difficulty should be moderate; Fully, appropriately and timely reflect the teaching content; It should be suitable for students' educational background; To be able to arouse students' interest in learning, etc. These requirements should be considered first as the designer of CAI courseware.
(2) Interaction and diversity.
Interaction and diversity are reflected in Multimedia CAI courseware. We should make full use of the function of human-computer interaction, constantly help and encourage students to learn, give students broad thinking space and give full play to their creativity. This principle requires CAI to provide learning evaluation function; Be able to record students' learning situation from time to time; Be able to make appropriate judgments on students' answers and have the ability to correct them; Be able to have diversified passion and encouragement: consider students' various solutions as much as possible; It can provide students with a broad thinking space, etc.

(3) Structure and integrity.
A good courseware structure is very beneficial to the designer's design and user's operation. In the design, we should consider that the courseware is mainly divided into several parts, what branches each part has, and how to connect between parts. A courseware is generally divided into three sections: courseware title, courseware content and courseware tail. Among them, the courseware content can be divided into review part, new teaching part and consolidation practice part according to the teaching process. The courseware content can also be divided into three parts: text, picture and animation according to the material type of the courseware. Each part of the courseware content maintains both independence and connection, which is very prominent in Chinese courseware.

3 Design of CAI Courseware for Basketball Teaching of Physical Education Specialty

3.1 Overall Design of Courseware

The participation of basketball sports multimedia teaching technology determines that the new classroom teaching mode is interactive and full participation. The use of basketball sports multimedia teaching technology can make all students actively participate all the time, solve the disadvantages of "Rao Xing psychology" (that is, only one person is asked at a time in traditional teaching) and "loss psychology" (some students who actively speak do not have the opportunity to answer) and maintain strong learning momentum. Enable students to obtain pleasant and successful emotional experience in continuous participation, so as to cultivate and improve their participation quality [6]. Feedback information can let teachers know whether students are in the best thinking state, adjust classroom strategies in time, and ensure the realization of teaching objectives. The feedback here refers to the timely feedback in classroom teaching. Students' thinking state, classroom participation atmosphere and emotional performance after learning new knowledge are the "barometer" of our classroom teaching feedback, which can be mastered by teachers in time through the participation of basketball sports multimedia teaching technology teaching. This is precisely the biggest weakness of traditional teaching.

(1) The guiding ideology of courseware design. Courseware should be the summary of teachers' many years of teaching experience and the product of the integration of teaching theory, educational psychological theory and computer technology. When using courseware, students should have the feeling of face-to-face teaching in class, guide students and teachers to think logically at the same time, and the key and difficult knowledge of teaching should be explained with dynamic graphics or dynamic surfaces However, graphics or animation should not dominate, but should strive to be concise, clear and smooth [7].
(2) Courseware teaching objectives Through the application of courseware in teaching or students' self-study, provide students with an interactive learning environment combining vividness and intuition, make full use of the functions of images, graphics, animation, audio and video in the courseware, make them establish correct

basketball technical and tactical concepts, master basketball technology and tactical cooperation methods and essentials, and master basketball technology and tactics in theory, Improve students' learning efficiency and interest Broaden students' knowledge and enable students to systematically master the relevant knowledge of the project.

(3) Courseware teaching content The main contents of this courseware include: overview, basketball technology, basketball tactics, group competition, physical quality, sports injury and common knowledge Q &amp. As shown in Fig. 2 below, CAI courseware basketball teaching is one hand shoulder shooting in place.

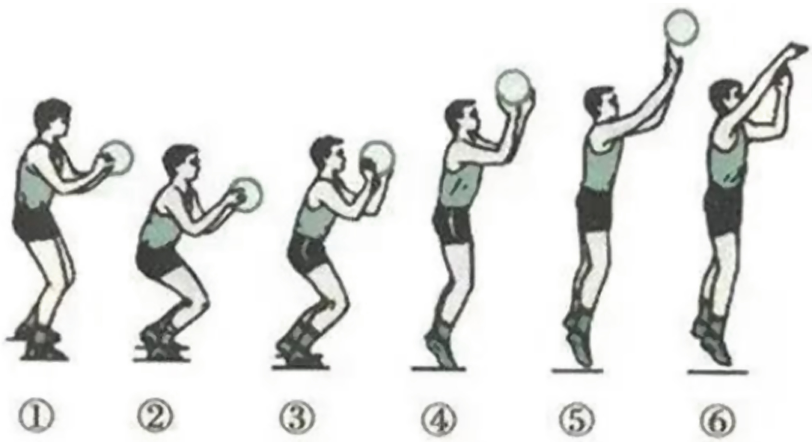

Fig. 2. CAI courseware basketball teaching in-situ one hand shoulder shooting

3.2 Courseware Making

Passing and receiving the ball is the basic technical action in basketball. It can be divided into in-situ passing and receiving, passing and receiving between marching, passing and receiving with both hands in front of the chest, single hand passing and receiving, etc. Among them, both hands chest front pass and catch is the most basic pass and catch action., Generally use both hands in front of the chest to pass at medium and close range. Two handed chest passing is the basis of passing technology, which has the characteristics of high accuracy, easy control and easy change. The action of passing and receiving the ball is divided into "passing" and "receiving". The purpose of passing the ball is to make the other party receive the ball better and smoothly [8]. Action Essentials: hold the ball in front of your chest with both hands, naturally separate your fingers, hold it on both sides of the ball backward, bend your knees and open it back and forth. When passing the ball, the center of gravity of the two legs moves forward, the two arms extend forward, the wrists turn upward, press down with the thumb, and the middle and index fingers pull the ball out in coordination. The technical essentials of catching the ball are that the two arms extend forward to meet the ball, the fingers are naturally separated, the two mother fingers form an eight character line, and the two hands are hemispherical. When the hand touches the ball, the two arms lead back to buffer and hold the ball in front of the chest.

The production process of courseware is shown in Fig. 3.

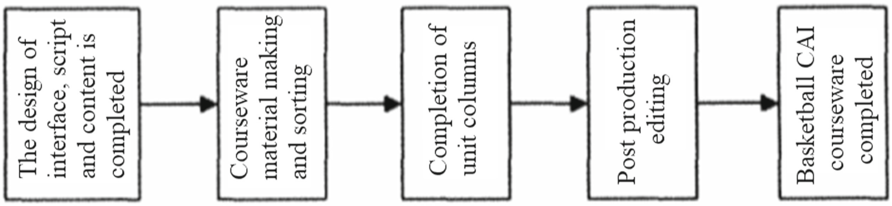

Fig. 3. Making process of basketball CAI courseware

(1) Script design of courseware. The script design of courseware is a very important part of courseware from design to finished product. The script design quality of courseware is directly related to the effect of CAI courseware. The script card design is mainly based on the content of text manuscript, and forms the teaching ideas, teaching strategies, selection of teaching media and information presentation in the courseware into each page It includes text, image, graphics, image, sound, music and other specific contents and their presentation forms in the page Script design is highly professional, and the design process must be detailed and accurate [9].

(2) Production of text materials There are three main characters in the courseware: ordinary static characters, animated characters and artistic characters. The three characters are mainly composed of Word2000 and Dreamweaver Flash and cool3d3 0 and other software. In the production process, different forms should be adopted according to different contents and themes, and strive to make the interface elegant and friendly.

(3) Image making The pictures, photos and graphics in the courseware are collectively referred to as images This part mainly comes from three sources: one is to scan photos and graphics through a scanner to generate image files, and then use Photoshop 5 0 and impactbalm; Second, for some other software or graphics and images downloaded from the Internet, capture the screen through PrintScreen and put them into the picture clipboard for processing and saving for standby; Third, capture some representative pictures in VCD and other videos through vidieosnip, save them as image files, and then apply them to courseware.

(4) Animation material production The animation material in this courseware is mainly the demonstration of basketball tactics Technical action demonstration is mainly realized through different video conversion Flash software is selected for animation production, focusing on the field background and complete tactical demonstration. An ideal flash animation model is made mainly according to the basketball tactical cooperation method and cooperation roadmap.

(5) Production of audio material Various sounds in the courseware come from three aspects: ① the explanation sound recorded according to the text manuscript; ② As background music; ③ Sound collected from VCD The sound of explanation must be accurate, with clear enunciation and reasonable rhythm. For MIDI selection of background music, four combinations should be highlighted, that is, the combination with the content of the interface; Combined with the color of the interface; Combined with the text and sound of this page; Combined with the action rhythm in the courseware [10].
(6) Production of video materials This is one of the important contents in the courseware. In the process of video production, we should select excellent audio-visual teaching materials, collect them into the computer through the acquisition card snazzi software, and then process and edit them with vidieoedor. In the acquisition, according to different needs, we should collect them into several forms such as sound, silent, slow action and constant speed action, and organize athletes and students to learn about some important teaching methods Typical errors, etc. shall be recorded with video equipment, collected and processed for standby.
(7) The overall production of courseware After the text, image, image, animation, audio, video and other materials are prepared, the overall preparation of the courseware is mainly based on the script card and courseware structure.
(8) Organize and pack the courseware After making the courseware as a whole, package the courseware after debugging, evaluation and modification When packing, all kinds of fonts and players are hit into the courseware, and then burned into a CD This courseware can be run with disk on computer.

4 CAI Courseware Teaching

4.1 Dynamic Display of Details and In-Depth Observation

Cai's rich and colorful audio-visual effects can enhance the intuition and vividness of teaching. Using cail can stimulate students' vision and hearing at the same time, highlight the key points and difficulties, and improve the efficiency of understanding and memory. For example, there are many key and difficult points in chemistry teaching, which are difficult for students to master through traditional teaching means, such as explanation, comparison, wall chart, demonstration and so on. CAI has great expressive power [11]. It is not limited by time and space, micro and macro. It leads students' vision to all fields at all times, at home and abroad, from micro to macro, and can reproduce all kinds of things, phenomena, scenes and processes in concrete images. In the courseware basketball physical education teaching, because the content is abstract, boring and difficult, the demonstration with general model can not give students movement, and it is easy to cause concept ambiguity. However, the balance of basketball layup, catch and running is clearly simulated by using the two-dimensional and three-dimensional image and animation functions of the computer, so that students have an intuitive feeling, It can understand the essence and characteristics of more scientifically and accurately, and achieve the effect that other teaching methods cannot or are difficult to achieve. Cai plays the role of turning difficulties into easy ones, highlighting key points and breaking through difficulties in teaching.

In nature, the speed of basketball achievement effect varies greatly. The most ideal observation can be realized with the help of CAI. The process is completed instantly, which is difficult to observe and judge [12]. Cal can display the pictures taken by the high-speed camera at normal speed, prolong its observation time and show the details in the reaction process. For other extremely slow technical actions, such as one handed shoulder shot during walking and two handed chest shot in situ, it is difficult to observe the process due to the long reaction cycle. The three-dimensional animation of CAI is used to simulate its process, compress the long change process to minutes and seconds, and vividly show the reaction process that is difficult to observe, so as to effectively remedy the deficiency of traditional teaching methods.

4.2 The Role of CAI Courseware in Basketball Teaching

(1) It is conducive to stimulate students' learning enthusiasm. As the saying goes, interest is the best teacher. Only by making students interested in this sport can we better stimulate students' enthusiasm for autonomous learning. Using CAI teaching mode and adopting more scientific and advanced teaching means and diversified teaching methods, students' attention can be better focused on classroom teaching and enhance the cohesion and appeal of the classroom, so as to stimulate students' autonomy in knowledge learning and make students more active in the process of learning, So that the efficiency and quality of classroom teaching can be essentially improved. A good technical action courseware through beautiful pictures Concise and clear images are very attractive and instructive to students [13].

(2) It is helpful to establish the correct concept of action. Using CAI teaching system, students can form a more profound concept of action in their mind by watching pictures, videos and sound from various aspects and angles. When they do the action again, students will have a more correct template to refer to and learn from, and the slow play, decomposition and other functions of HCAI teaching system are the effects that teachers can't achieve in classroom demonstration at ordinary times.

(3) It is conducive to highlight the teaching key points, break through the teaching difficulties and improve the teaching quality. The key and difficult points in the teaching process are the difficult points when teachers teach. The use of Multimedia CAI technology can strengthen the key points, make students pay more attention to the key learning, and analyze the difficult points more carefully, which is conducive to students' better research and mastery. Adding CAI teaching mode can effectively alleviate the problems of heavy teaching tasks and less class hours, and save teaching time, so that teachers can have more time to pay attention to students' practice and guide students' specific exercises [14]. Using multimedia technology to assist teaching can greatly increase classroom address, increase information density, improve teaching efficiency and enrich classroom content. Using the storage and network functions of the computer, teachers can display all kinds of information, pictures and sounds related to the teaching content of this class in the classroom, such as teaching courseware, video tape and CD, so as to help students master more content outside the textbook or the cutting-edge knowledge and latest technology of this subject. On the one hand, it enables students to master computer technology and comply with the trend of the information age [15]; On the other hand, it has

increased professional and technical knowledge, enriched amateur cultural life and broadened vision Promote the development of students' knowledge and ability, and help to improve the quality of education.

5 Conclusion

In short, the application of basketball CAI courseware not only solves the problem of tight and unsystematic teaching time of basic knowledge and theory in basketball course, but also improves the problem of non intuitive explanation of technology and tactics in theory part and the unity and standardization of technical actions in practice course. The application and development of multi-media teaching not only involves the reform of teaching methods and teaching means, It also affects the development of teaching mode and teaching theory. The use of multimedia technology teaching is the direction of physical education teaching reform in the future. College basketball teaching should try to use CAI technology for teaching when conditions permit, so that it can supplement the shortcomings of traditional teaching methods, so as to improve the teaching quality and really be popularized and applied in practice.

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