

A Review of Present Situation and Development of College Sports Network Teaching

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Abstract — With the development of computer technology, multimedia technology, communication technology, the new education pattern represented by education technology came into being in the field of education in China, of which the multimedia network teaching is quite prominent. Sports teaching is a bilateral activity of teaching and learning with strong sense of practice and participation. Compared with other disciplines resources on the network, the current resources for sports are relatively less and lack integration.

Keywords - Network; University; Educational technology; PE education

I. INTRODUCTION

"Like sports, don't like PE class" is not only the ubiquitous phenomenon in primary and secondary schools, it is also a widespread phenomenon in the university. Over the years, the traditional education mode "exam-oriented education" is at the expense of the students' personality, interests, hobbies, emotions and talents. Measure and constraints students with unified standards, ignoring the "people-oriented" education thoughts.

In September 2002, the national ordinary higher school physical education curriculum teaching guidelines was established, which means the start of a new round of ordinary university sports curriculum reform. Strengthen students' lifelong sports awareness to get into the habit of physical exercise, making it not ended with the students graduation is the ordinary university sports teaching reform research hot spot problem.[7] A variety of teaching mode co-exist in Physical education in common colleges and universities in our country now. Huang Lisheng boiled the situations down to five kinds of teaching mode of college sports: "sanki type", "integration type", "equal type", "three-phase type", "club type". Each of these teaching mode have their superiority, but they also has its disadvantages. From the perspective of cultivating people and development point of view, the sports teaching club as a new teaching mode, was showed by practice to has its own unique, which is the ideal model of current teaching college sports, also the development trends of national ordinary university sports teaching reform. [8]

The exam answer system is a very important part in computer aided test system, on which students realize answer the questions on the communication system. Whether the design is reasonable and human or not will definitely affect the final scores. A humanization, simple reasonable exam answer system can let students feel free for test operation, thus reduce the tension of the examinee exam,

promotes students to develop their own potential, and get a good result. Only by cooperating with other systems, can exam answer system play its role. The supervise system of examination system will exhibit test questions according to the order on the screen. [4]When the invigilation system send out a certain command, exam answer system would react accordingly to process text, images, audio, video, etc. So exam answer system can be divided into three parts, as shown in Figure 1.

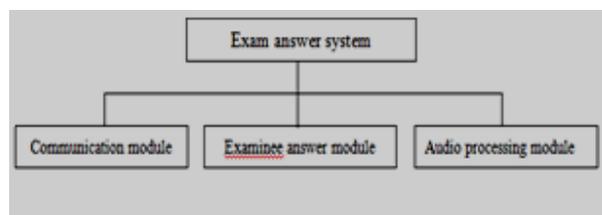


Figure 1. Functional modules of the exam answer system.

II. ORIGINATION OF NETWORK TECHNOLOGY APPLICATION IN THE PHYSICAL EDUCATION TEACHING AT NETWORK ERA

A. Reasons for the application of network technology in colleges sports teaching

Along with the network era, the influence of the network technology in teaching work is increasing in colleges and universities. [9]The wide application of network technology provides important carrier for the sports teaching information, its role in the work of teaching are increasingly significant. The development of the college education work cannot happen without the Internet in the future. At present it has become the hot spots that how to efficiently use sports venues and the reasonable distribution of physical education teachers in colleges and universities to save teaching resources, soften the pressure the universities sports teaching facilities brought about by faculty shortage.

Application of network technology in college sports teaching process can break through time and space constraints, using the network technology can effectively solve many problems appeared in the process of sports teaching in colleges and universities. Network technology application in the teaching of the university sports can also improve students learning initiative to change students too passive to accept knowledge, at the same time autonomous orbit personalized learning plan for college students according to their own characteristics and actual demand provides the space security, which has a positive role for contemporary college students cultivate their innovation spirit of cooperation and to adapt to the development of the information age in the future. Application of physical education network technology in the colleges and universities has brought new challenges for the traditional model of physical education teaching. [2] As the sports teaching information level increase ever more rapidly, the sports teaching the timeliness of information is more and more strong, the traditional mode of physical education knowledge information update slow, unable to keep up with the times demand, which make university increasingly need sports teaching by using advanced network technology to improve, application of the network technology in colleges and universities sports teaching has become the inevitable trend of colleges and universities sports teaching in the future. Based on the analysis of the improved methods of sports teaching in colleges and universities the network under the background of current era, the analysis of the network technology play positive role in the process of college PE teaching in colleges and universities sports teaching and the influence[1].

B. Influence factors and advantages of network technology application in the physical education teaching in colleges

Compared with the traditional mode of physical education teaching mode, network technology application in the teaching of the college sports has a more intuitive and efficient teaching effect. Rapid development of network technology has brought a new element to the current college sports update and provides technical support and protection to improve the way of teaching. Physical education teachers in colleges and universities how to use network technology to science and technology as soon as possible, changing the traditional teaching of college PE teachers thinking is critical, at the same time, the teaching idea of physical education teachers in colleges and universities directly affects the application of network technology in the universities sports teaching the use of frequency and degree of depth. [15]

The traditional mode of PE teachers in colleges sports teaching way is one way of interpretation about the teaching, the application of network technology the traditional classroom teaching breakthrough in colleges and universities sports teaching environment teaching in

quantity as well as the time and place. The Internet becomes the sports teaching of teaching information repository for sports teaching information through the network and the sports knowledge become the university sports an important and feasible way to learn and how. Traditional mode of education teaching mode has been difficult to adapt to the demands of the development of the Internet age, physical education teachers in colleges and universities are not only a professor of sports discipline but also need to be more sports technology practice guides. [11]With the advent of the Internet age, sports knowledge information update speed accelerating, quick and easy to get through the network sports information knowledge needed to become more and more choices, ability of information environment and cooperation learning ability and innovation ability has been greatly improved. To make the connection of these factors to be clear, the Figure 2 is made as the following.

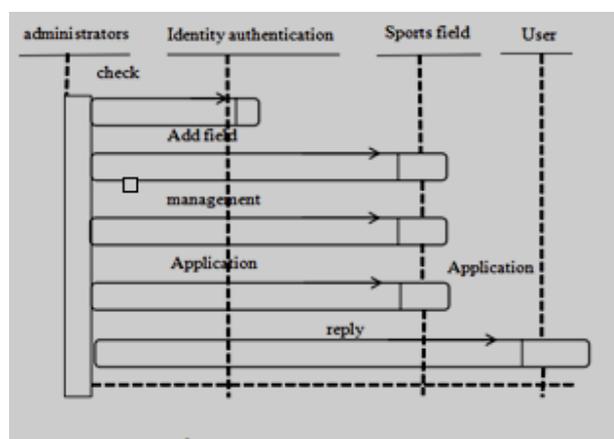


Figure 2. Sports site management module sequence diagram.

C. The trend of the development of the sports teaching in colleges

In recent years, with the advent of the Internet age and the rapid development of network technology, network technology is gradually introduced to the teaching of colleges and universities, promoting the education reform of traditional teaching mode. Under the impetus of the national policy and funding, most domestic colleges and universities have applied to the teaching of network platform, at present most have completed the network platform for the construction of excellent courses in colleges and universities, colleges and universities has also set up network teaching resources sharing platform so as to make colleges and universities sports teaching resources are efficiently used through the use of the network teaching resources platform. Colleges and universities sports teaching are an important part of today's college education. With the establishment and perfection of the network teaching platform in colleges and universities, it is bound to cause the trend of sports teaching reform combined with network

technology. Under the background that students use network technology in university for their own learning convenience, at the same time, it has become the research hot spot of college PE teachers that how to reasonable use of network technology in colleges and universities sports teaching.[6] Attention of the network technology development from the government and the society provide a good development environment for sports teaching in colleges and universities because colleges and universities sports teaching modernization need the support of advanced network technology. Electronic multimedia teaching course ware under the network environment of and on-line data transfer system provides the guarantee for colleges and universities sports teaching to use network technology to teach. Colleges and universities sports teaching network platform ensure the reasonable use of network technology in the universities sports teaching for college students' physical education curriculum, which provide a stable and efficient learning environment. Under the background of national teaching reforms in colleges and universities across the country and rapid development the network technology, the formation of the network technology in colleges and universities sports teaching fusion is an inevitable trend. In order to meet the needs of the development of the university sports teaching to fill the limits of the traditional sports teaching in time and space, in combination with the features and requirements of physical education in colleges and universities based on network technology used in colleges and universities sports teaching in detail the feasibility analysis, an applied research is done in this paper to improve the future sports teaching in colleges and universities to achieve reasonable use of network technology in the teaching of the college sports. [8]

Cloud computing

Cloud Computing is a new word born in the third quarter of 2007. Only after half a year, its popular exceeds the grid computing and becomes the most often used technology words with 3G and the Internet of things in the IT industry.

Cloud computing is divided into three service types: IaaS, PaaS and SaaS.

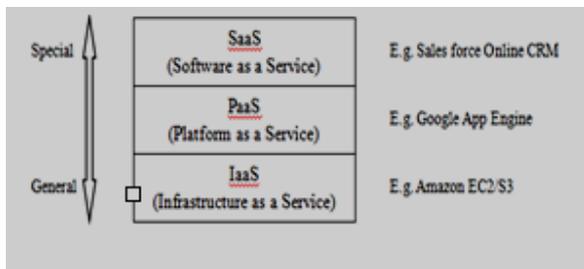


Figure 3. Cloud computing service type.

From the Figure 3 above, the service type of cloud computing is clearly illustrated.

Cost consisting factors cloud and data center

Jim Gray points out in the thesis of distributed computing efficiency that a computational task usually consists of four characteristics of demand:

Network: transfer requests and responses

Computing: process information and produce new information

Data access: access and obtain the required information

Data storage: long-term preservation of data, in order to meet the needs of data access in the future

Scale effects of computing resources

Assume that there is only one server and an IT administrator; take computing power of a server as output of IT department, the cost of an administrator as the cost. [2] If an administrator can support maintenance and management of 10 servers and applications, then when adding a server, cost is just the power consumption and the cost of the equipment itself, the marginal cost of the IT system decreased.

Marginal cost refers to the increased cost for an additional unit of Output. By definition we can know that marginal cost is equal to the total cost (TC) variation (ΔTC) divided by the corresponding output variation (ΔQ), namely: $MC(Q) = \Delta TC(Q) / \Delta Q$

Formula for cost of cloud computing

Costs of cloud computing platform C_{TCO} , the overall cost of ownership, which is respectively consisted of the hardware C_{HW} , software C_{SW} , the network bandwidth C_{WAN} , space C_{Space} , electricity C_{Power} , and the management of maintenance C_{Man} . It can be expressed by the following formula.

$$C_{TCO} = C_{HW} + C_{SW} + C_{MAN} + C_{Space} + C_{Power} + C_{Man}$$

The main cost of the system level of IaaS cloud computing platform is given here. The total cost is expressed by C_{IaaS} .

$$C_{IaaS} = C_{HW} + C_{Power} + C_{Man}$$

If the user rent the cloud computing resources according to the server, billing way is by rent fee for server per hour per. [3] So getting server cost per hour of work is key indicators KPI to measure whether the cloud computing platform has the cost advantage.

$$C'_{IaaS\text{hour}} = ((C_{HW} + C_{Power}) / L_{HW} + C'_{Manhour}) / N_s T$$

total life cycle cost formula of hardware resources

In construction of the cloud computing platform, the cost factor of resources includes the hardware cost and power cost. Through the reasonable scheme as well as the

necessary technical means, it will be able to reduce costs effectively and increase cost effectiveness.

$$\sum_{i \in w} C'_{HWhour}(i) = \sum_{i \in w} (C_{Purchase}(i) / L_{HW}(i)) + (1 + R_{cool}) \sum_{i \in w} C_{Power}(i)$$

Utility function of cloud computing cost

The cost of life cycle of per server hardware is calculated according to the number of servers. [14].

$$Utility_{CostHourV}(w) = \sum_{i \in w} C'_{HWhour}(i) / \sum_{i \in w} N_v(i)$$

The above type can also be expressed in computing power. $P(i)$ is the calculation ability of the server i , with Ops as a unit of measurement.

$$Utility_{CostHourC}(w) = \sum_{i \in w} C'_{HWhour}(i) / \sum_{i \in w} P(i)$$

Cloud computing equilibrium performance utility function

If not consider the cost factor, balanced performance utility function said the relationship between the bandwidth and computing power utility.

$$Utility_{BalancedPerf}$$

$$Utility_{BalancedPerf}(w) = \sum_{i \in w} P(i) / \sum_{i \in w} B(i)$$

After the cost factor added to the formula, the cost effectiveness function of the balance performance of cloud computing.

$$Utility_{BPCost}(w) = \sum_{i \in w} C'_{HWhour}(i) / \sum_{i \in w} P(i) \times B(i)$$

The design of the teaching resource sharing system based on cloud computing

The realization of the system is based on the understanding of Google App Engine cloud platform operation mode and analysis of the business requirements. [4]Due to some standard technology support of GAE platform for JAVA is not perfect, in the process of using J2EE standard implement this paper made some changes, which is one of the difficult points of the system implementation. The biggest difficulty is how to carry out persistence operation on this system.

III. SPORTS NETWORK CONSTRUCTION SITUATION OF DOMESTIC COLLEGES

A. The foundation of network teaching in colleges

With the popularity of computer hardware, teaching resources rich, especially with the development of the Internet, more and more colleges and universities is running and ready to run their own campus network in our country at

present. Campus network is the platform to carry out sports technology of network teaching, establishment of the campus network and the campus sports sites directly determines whether the school has feasibility of the physical network teaching.

National ministry of education has been demanding universities to set up their own campus network from 1999. The building up of sports education in campus network page will be a new development environment for education. [4]From the perspective of the number of campus network, the establishment of the campus network in colleges and universities has reached the degree of popularity. But there are still many problems in the construction of the sports page. Number of campus network in colleges is little, content of home page has been opened is not rich, the update of the information is general, the column is not comprehensive. And there are a lot of school sports page are only be briefly introduced by text, failed to build a multi-level links. [3]Education developed by the university sports network function of the school are much rarer, only reach 7.8% of the total number of campus network. Sports website construction quantity is little, low quality, and shortage of sports development of network education is now the general situation of our country's colleges sports network. The overall situation of the research is conclude in the table 1.

TABLE I COLLEGE SPORTS PAGE CLASSIFICATION STATISTICS

site type	quantity	ratio of sports site	ratio of school site
type A	34	24.8	7.8
type B	83	59.9	18.9
type C	21	15.3	4.8

The implementation of online sports in college campus network in China mainly includes the following forms.

(1) Sports page of department

The sports page of department is the main way of current college sports on the Internet. The school physical education and management department is responsible for the preparation, opening and maintenance. If access to the sports page, it generally visible to the following content: college introduction, organization, personnel structure, physical teaching, group activities, sports competition, facilities, and sports scientific research. More perfect sports page will contain related sports teaching material library. Some schools will show the special physical education teacher recruitment information on the Internet, which makes the function of campus sports homepage to expand unceasingly. [10].

(2) Course ware of material library

This is different subjects of teaching course ware set up by some online college or education institute of technology; many schools have set up a number of sports teaching course ware. Open and maintain the site generally

undertaken by education technology center or the school network management center. The home page typically contains text, images, introduce some sports, a stunning clips, etc. Due to the the opening of sports page lack of participation of sports professionals, usually lack a certain logic, consistency on a set of content, page not arranged according to certain sports teaching regularity between the layers. The home page usually includes the following contents: theory of sports health care network and sports technology teaching network. Web page consists of different sports teaching sports technology teaching course ware, it contains the basic situation of sports introduction, the rules of the game, explaining, behavioral essentials, key techniques and tactics the difficulty, good game clips, etc. Some material database will also link to some other professional sports material network, as an extension of the school sports resources.

(3) Sports community home page in the campus network

Sports community home page is simple home page set up by various sports social organizations in the school, which are generally managed by our community members. Generally each community home page is set only around a sport project, and this target is usually the project popular with higher levels. [12].

B. College students in Internet

After investigating the domestic six college students, the outcome is shown as follows:

TABLE II ANALYSIS OF WEEKLY ON-LINE TIME OF STUDENTS

	frequency	percent	valid percent	cumulative percent
over 12 h	101	24	24	24.0
9-10 h	52	12.3	12.3	36.3
6-8 h	25	5.9	5.9	42.2
3-5 h	146	34.6	34.6	76.8
less than 2 h	97	23.2	23.2	12.7
total	421	100	100	100.0

TABLE II shows that of the 421 people surveyed, the majority of students are those on online in 3 a 5 hours a week and those more than 12 hours time, namely 146 and 101 people respectively. These two kinds of students account for 58.6% of the total number of students. Namely students surf the Internet time difference is bigger, exhibiting in two extremes direction in the distribution as shown in Figure 4.

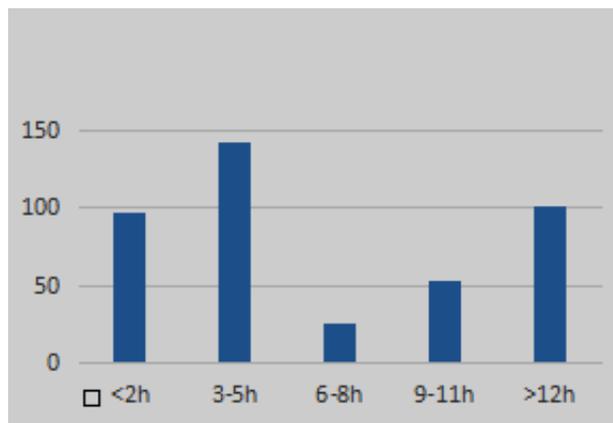


Figure 4. Statistics of college students' internet time

Through discussion, it is known that the students surf the Internet mainly through three ways: basic course of computer network the school open, surf the Internet in the dormitory through the computer bought by themselves, or Internet cafes in the center of the school network.

School of computer, network and other basic conditions and Internet connection to a certain extent determines the Internet time, differences between students and regional economy also impact students' surfing time.

In addition, the survey shows that 71% of students like to surf the web on the sports information resources, and there are 11% of the students said they will focus on the sports section first home page in a comprehensive web site .

Research shows that the domestic college students basic have a certain condition, the Internet has a relatively stable time online, and the sports resources on the network information shown higher interest and acceptance. Development of network education function of sports resources should be feasible.

IV. FACTORS THAT RESTRICT THE DEVELOPMENT OF THE PHYSICAL NETWORK TEACHING IN COLLEGES

A. Block of the traditional physical education concept on the development of the network teaching

While the former Soviet union sports teaching theory exerted some positive effect on the traditional sports teaching in China in the aspect of teaching organization systematic standardization and knowledge skills had a positive effect, it ignored theory that closely related to the physical education teaching of psychology, sociology, logic and so on the role of science; In practice, neglecting the students personality development lack of the cultivation of student's ability and quality. [5]Centralized type of school physical education ignore the regional differences, ignoring the students psychological differences between different age, a nationwide unified teaching materials in colleges and universities teaching content that make primary and

secondary school textbooks appear a large number of repeat, highly similar patterns of teaching. Many domestic colleges' teachers accustomed to this kind of teaching mode at present that teachers teaching according to teaching plan and subject consciousness. The students will follow what the teacher says. Teachers are organizer and commander and leader, worthy of the name. Their understanding of school sports goal is too paranoid, thinking that school physical education is to be used to exercise the student body; any violation of this goal is not acceptable. Network teaching has violated the sports teaching in the form of body involved in dependence, unable to achieve the basic purpose of school sports build our bodies on the teaching target, which launched a great challenge to traditional sports concept. That's the main reason why many teachers against for the physical network teaching.

B. Serious shortage of network teaching infrastructure and the qualified teachers [13]

The first condition of sports network teaching is to build a network teaching environment and platform for teaching activities under the certain network environment, which means to establish a large capacity computer connected to the Internet platform. Its development in the college of computer equipment and network equipment. Because of this, lack of funds and equipment problem are often encountered in the process, which is the basic conditions and the primary problem to realize the network teaching.

At present, the college network infrastructure still exist many problems, such as information highway congestion, low computer penetration rate, slow network transmission speed, broadband telecommunication network multimedia transmission information needs to improve the quality and stability. The establishment of the campus network has begun to take shape, but since most of the opening of the colleges and universities campus network and the maintenance time is shorter, the sports web site has the problem of being low quality. The sports page number is little, often lack the physical education teaching material, and school and students personal computer ownership is generally low, especially in the western region.

V. COUNTERMEASURES OF THE DEVELOPMENT OF COLLEGE SPORTS NETWORK TEACHING

A. Set up correct concept of network teaching.

At present, the vast majority of PE teachers did not clear the multimedia network to highlight the value of physical education teaching, so universities should enhance policy propaganda, strengthen the important role of multimedia network teaching, include the popularization of multimedia network teaching when making development

plan of colleges and universities, formulate scientific and rigorous network evaluation criterion to create a good atmosphere for the development of multimedia network teaching. Both universities, sports education workers and students should fully realize the strong connotation of modern information technology, grasp the overall trend in the development of world education areas, strengthen the use of modern information technology and set up the multimedia network teaching values.

B. Strengthen the physical education teachers of modern information technology training

Colleges and universities should guide the physical education teachers change ideas, constantly strengthen the depth and breadth of information training, and enhance physical education teachers to have better media network teaching ability. [14]For the teachers with relatively weak information technology, strengthen the popularization of basic knowledge. For those teachers with relatively mature information technology, guide them to make full use of multimedia course ware for teaching, master the basic methods and principle of course ware design and skillfully use multimedia course ware design. In addition to this, schools can an also increase funded training in the physical education teachers in colleges and universities, organize regular visit foreign PE teachers, improve the theoretical basis of information technology, conduct the competition of multimedia course ware and view in various forms so as to improve teachers' ability to integrate information technology and so on.

VI. CONCLUSION

With the development of the Internet age, network technology has been applied in the teaching of colleges and universities to a wide range, which not only promote the development of modern physical education in colleges and universities, but also promote the continuous update of college PE teaching model. Apply network technology into college physical education teaching not only promote the demand for the development of modern physical education teaching in colleges and universities, but also broaden the channels of sports education through the sports teaching network platform, which provides the technical support for the realization of lifelong physical education. By network technology, schools can create their own sports teaching network management system to help conduct the intelligent management on colleges sports teaching to promote learning autonomy of middle school students' sports teaching, make it convenience for physical education teachers in colleges to timely grasp student's study situation, and provide effective information to help for the arrangement of the sports teaching work in colleges.

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