# Application of Network Course Platform Based on Cloud Computing in Physical Education

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**Abstract.** On the basis of traditional teaching, through the combination and application of current network technology, we can finally break through the restrictions of space and time in the traditional classroom. This is the so-called network course teaching, which can meet the needs of modern education more effectively. With the continuous development of network course teaching, it has attracted the attention of many scholars, and the research on network course teaching has become more and more extensive and in-depth. Nevertheless, there are some problems in the process of the continuous development of network course teaching, and the introduction of cloud computing in network course teaching can effectively improve these problems. This paper introduces the application of network course platform based on cloud computing in physical education teaching for your reference.

**Keywords:** Cloud computing · Network course platform · Physical education

## 1 Introduction

For the specific situation of the current development of university education in China, physical education, as a formal discipline, plays a vital role in students' university life. In the teaching process of physical education in universities, It is mainly taught to students by combining theoretical knowledge with social practical experience "Among them, the theoretical knowledge mainly includes the relevant knowledge of physical education major and some expanded common sense. However, the integrity and reliability of these physical education knowledge are not so optimistic. In addition, sometimes the students can not master and skillfully apply them. In this regard, it has brought great difficulties and obstacles to the teachers in the process of school physical education teaching. Many teachers have been Try to find a way to solve this problem, but no better solution has been found. This problem has been perplexing the workers of physical education teaching.

The development of the Internet is changing our study and life. Applying network technology to college physical education classroom can not only enrich teaching means and intuitively show teaching content, but also improve students' learning interest and expand students' knowledge. Of course, everything has two sides, and network teaching also has some disadvantages [1]. Teachers and students need to work hard and make


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full use of the convenience brought by science and technology, so as to promote the development of physical education and teaching in Colleges and universities. This paper expounds the advantages and disadvantages of sports network teaching, analyzes the current situation of Sports Network Teaching in Colleges and universities, and puts forward improvement measures, hoping to promote the development of Sports Network Teaching in Colleges and universities.

The advantages of college physical education network teaching are mainly reflected in: first, compared with traditional multimedia teaching, network physical education teaching not only displays rich pictures and materials, but also has an activity communication platform. Teachers and students and students can interact and communicate and feed back teaching information in time. Second, network physical education can solve the contradiction between physical education teaching content and teaching hours [2]. Through sports network teaching, teachers can put the contents that are not talked about in class or can be self-taught through the network on the network platform, and students can use their spare time to study on the platform, which will expand students' learning of theoretical knowledge and improve the quality of outdoor classroom teaching. Third, sports network teaching can expand teaching content and improve teaching methods. The rapid development of science and technology and the times sometimes make us unimaginable. In particular, some professional knowledge and industry development trends, through the network, teachers can transfer the latest knowledge and dynamics through the network, so that the teaching content can keep up with the development of the times and disciplines.

Physical quality education is the basis and premise of comprehensive quality education. When carrying out physical education courses, colleges and universities must pay attention to the effective application of sunshine sports and lifelong sports ideas and thinking, constantly innovate and reform college physical education teaching strategies and methods, and promote the effective improvement of the effect and quality of college physical education. Physical education teachers in Colleges and universities must emancipate their minds, keep pace with the times, expand physical education with modern teaching thinking and ideas, fully tap and make use of mobile network technology resources to enrich the form and content of physical education in Colleges and universities, broaden the path of physical education in Colleges and universities, and provide good conditions for the better development of physical education in Colleges and universities [3]. At the same time, when carrying out physical education, colleges and universities should also comprehensively analyze the current situation and characteristics of the application of mobile network technology, master the specific problems of mobile internet teaching, and put forward practical solutions and countermeasures, so as to promote the effective improvement of the quality of physical education teaching in Colleges and universities.

With the advent of the Internet age, China's education is also undergoing reform and innovation. In order to promote the development of education, a new network teaching method is gradually rising, and schools also begin to carry out digital education. In order to adapt to the trend, many schools have established network teaching platforms and implemented online teaching. Relying on cloud computing technology and aiming at building a global integrated distance education mutual aid platform, the world university city provides conditions and possibilities for the new reform of education and teaching in the application-oriented information age. “Cloud platform” and “cloud space” are the sharp tools provided by the world university city for a new education and teaching revolution. It is the carrier and tool platform for the reform of teaching and learning methods in the information age Windows and ties, “The premise of” cloud space “teaching is the construction and continuous improvement of teachers’ and students’ personal” cloud space “, and the full development and excavation of the function of” cloud space “[4]. Physical education” cloud space “ It is a powerful supplement to physical education in the information age. Compared with traditional teaching methods, online teaching can make use of rich network resources and greatly improve the quality of teaching. Some schools also build online physical education teaching platforms through network construction, including physical education theory education and learning progress assessment, which adapt to the trend of modern informatization, which not only improves the quality of teaching, Improve students’ interest in physical education and have the best of both worlds. The establishment of sports network education platform can make students understand the significance of learning sports, establish the concept of sports and exercise, and cultivate a good living habit, which is of great significance.

## 2 Related Work

### 2.1 Cloud Computing

“Cloud computing” is a mode of increasing the use and delivery of Internet-based related services. It usually involves providing dynamic, scalable and often virtualized resources through the Internet, and providing a set of abstract, virtualized, dynamically scalable and manageable computing resource capacity, storage capacity A large-scale distributed computing aggregate of platforms and services. Computing technology has the advantages of high stability, rapid deployment, dynamic capacity expansion and on-demand services.

In popular understanding, the “cloud” of “cloud computing” is the resources existing on the server cluster on the Internet. The local computer only needs to send a demand information through the Internet, and thousands of computers at the far end will provide you with the required resources and return them to the local computer [5].

The “World University City” jointly developed by Huaxia high tech Industry Innovation Award Office, the Institute of campus card standardization of the education management information center of the Ministry of education and Beijing Hetian Yuxiang Internet Technology Co., Ltd. is a cloud service relying on “cloud computing” technology.

Cloud hosting, or personal space, is called personal homepage. It relies on cloud computing technology, relying on cloud platform, distributing personal electronic ID number according to personal effective identity information, and distributing the real learning space based on real name according to the electronic ID number. “Cloud space” has powerful The resource reserve function of personal space based on cloud computing technology is essentially - a powerful and massive information reserve. It has broken through the limitation of information reserve of traditional paper media and even a single information terminal, and provides unlimited possibility, reality and convenience for the storage of personal information (resources). The schematic diagram of the design concept of "cloud space" in physical education is shown in Fig. 1.

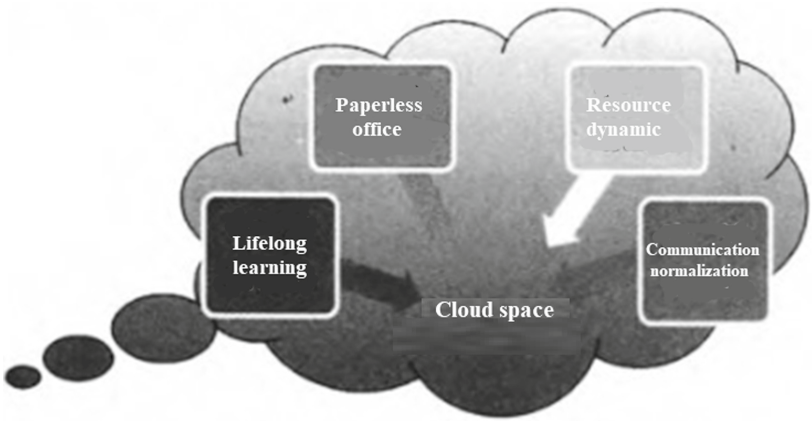


**Fig. 1.** Schematic diagram of design concept of "cloud space" in Physical Education

### 2.2 Advantages of Cloud Computing

(1) Cloud computing can improve the management efficiency of existing devices
Cloud computing can improve the management efficiency of existing equipment, which is mainly reflected in the following aspects: first, with the deepening of the integration content of cloud computing system and the aging and elimination of traditional manual management mode, cloud computing completely subverts the original management mode; Secondly, cloud computing can realize system resource allocation through VMware view manager; In addition, with the deepening of the integration content of cloud computing system and the aging and elimination of traditional manual management mode, compared with the traditional mode, cloud computing makes the management mode more simplified, so as to realize the unified management of the entrance.
(2) Cloud computing can improve the fault tolerance of existing devices
Similarly, in the traditional IT architecture model, high availability supports business systems. VMware view manager usually realizes fault tolerance through high availability mechanism. Compared with the hyper V Management Platform in Microsoft's Windows Server 2008, VMware view manager realizes fault tolerance, which is really completed at the virtual machine level. With the same level of fault tolerance, the price will be much smaller [6]. Or, for the same price, the cloud layer of fault-tolerant infrastructure can be higher. The development history of cloud computing is shown in Fig. 2 below.

### 2.3 Problems in Physical Education Teaching

At present, the main problems in the development of sports informatization in China are as follows:

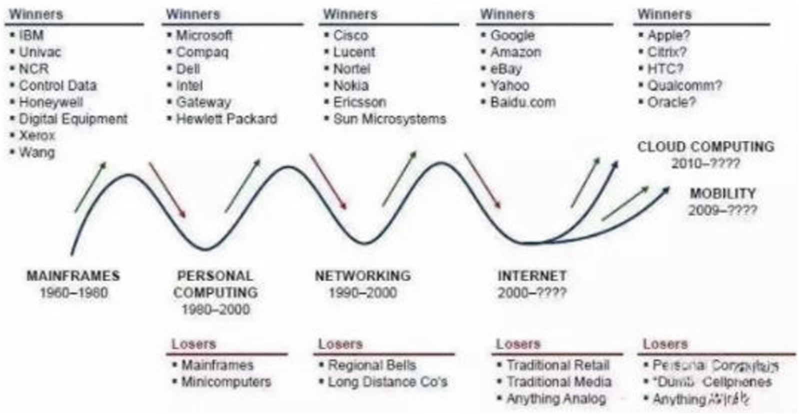


**Fig. 2.** Development history of cloud computing

1. The sports information resources with multiple subjects and multiple structures are too scattered, and there is a lack of ways and platforms for the efficient integration of massive information resources. If the data format is not unified and the data quality is uneven, it is impossible to develop deeper value.

2. The content of sports information public service platform is not open enough, the development means are insufficient, the interoperability is not strong, and the update is not timely. The process of sports informatization lags far behind the development level of modern sports industry, and a large amount of competition information can not be pushed to interested audiences.

"Smart sports" is a new form of sports informatization and a further expansion and promotion of digital sports. It comprehensively uses information technologies such as cloud computing, Internet of things, cloud computing, big data, intelligent perception and social network [7]. It has the characteristics of wide coverage, collaborative operation, intelligent processing and sustainable innovation. These characteristics effectively solve the development problems of the sports industry Build a new service system and service model in the way of "smart sports" to meet the needs of different groups. High efficiency and low-cost intelligent services enable sports participants to carry out efficient and coordinated operation and promote the all-round development of sports.

Generally speaking, when smart sports is completed, the operation of sports industry will be automated; At the same time, the service quality has also doubled. For example, intelligent sports facilities will be unattended and equipped with self-service Bracelet taking machines. After authentication through QR code, face recognition and other methods, you can get the bracelet, and then use the same method to return it; During the movement, relying on the automatic data collection of the control system, the management personnel can timely adjust the site temperature, humidity and other indicators to ensure the comfort during the movement. The light control system can intelligently adjust the lighting; People can also complete a series of operations online, such as online booking, credit payment, appointment, event registration and fee AA.

At present, China is in an important period of promoting the strategy of building a strong sports country, and the state strongly supports the development of digital sports industries such as intelligent sports equipment, “cloud computing + sports” and smart stadiums. However, from the current situation of sports development in China, there is still a certain gap between the sports level of China and developed countries such as the United States, Germany and the United Kingdom, Some high and new sports technologies are still mastered by foreign enterprises, and there are relatively few cases of integration of science and technology and sports in China, which urgently needs the support of the government [8]; At the same time, taking advantage of the favorable opportunity of national support for the development of smart sports, the sports industry needs to strengthen scientific research and innovation, and actively explore new business forms, new products and new models of the integration of sports and “cloud computing + “, so as to promote the improvement of China’s sports level and contribute to a powerful sports country.

## 3 Overall Planning of Sports Online Education Platform

### 3.1 Advantages of Online Education Platform

Physical education network course is the sum of the teaching contents and teaching activities of a subject through the network. It includes two parts: the teaching content organized according to certain teaching objectives and teaching strategies and the supporting environment of network teaching. Compared with traditional classroom teaching, physical education online course has obvious advantages. It is not limited by time and space[9]. At the same time, it also provides students with a personalized learning environment. Today, with the rapid development of information technology, if we can make full use of the advantages of sports network curriculum and apply sports network curriculum platform to build a new teaching model of sports curriculum, it will solve the problems encountered in the current curriculum teaching to a great extent.

Blended learning (also known as blended learning) is a teaching method that combines the advantages of traditional learning methods with the advantages of e-learning (i.e. digital or network learning). Mixed learning mode enables teachers’ teaching work to be implemented in the classroom and network, and network learning has become a natural extension of classroom learning [10]. After constructing the mixed learning model, teachers must organically integrate the classroom teaching content and network teaching content. The key points and core contents of the course are explained in detail in classroom teaching; Some details that cannot be taught and easy to understand due to the time limit of classroom teaching and knowledge points not involved in the exam, such as string, array, generalized table, etc., are put into the sports online course, which is left for students to study in their spare time according to their own situation. Teachers can also use the sports network curriculum to show students the horizontal and vertical links of various knowledge points, the links and differences between chapters, help students sort out the curriculum content, clarify its internal links, and promote students’ learning and grasp of knowledge.

Cluster technology can be defined as follows: a group of independent servers are represented as a single system in the network and managed in a single system mode. This single system provides high reliable services for user workstations.

The purpose of cluster technology is to improve system performance, reduce cost, improve scale scalability and enhance reliability Common clusters include high-performance science cluster, load balancing cluster and high availability cluster. They are often mixed and crossed. Therefore, the classification of cluster categories is a relative concept [11]. The load balancing cluster can share the load (usually including application processing load and network traffic load) equally in the computer cluster as much as possible. Such a system is very suitable for providing services to a large number of users using the same group of applications. Each node of the cluster can bear a certain load and realize the dynamic distribution of load among nodes, To achieve load balancing Since the most urgent problem to be solved in the construction of sports network curriculum platform is how to realize system load balancing, load balancing cluster is selected here.
(1) Liberalized teaching methods
Network teaching is more convenient for teachers. Teachers can choose their own teaching mode arbitrarily, and the teaching methods are rich and diverse. Teachers can let students know more about physical education through online teaching resources, and gradually solve the shortcomings of closed teaching in the past. Students can improve their autonomous learning through the teaching platform without learning in a limited time.
(2) Diversified teaching contents
Network teaching can better show the sports content, including some difficult and difficult movements, which can make students understand and learn well, which can not be done in traditional sports teaching. Traditional physical education teaching is teachers' action explanation. Some actions can not be displayed at all, but can only be imagined by the students themselves. In this way, the learning efficiency is not high. The rise of network physical education teaching has solved this problem well, and can make students learn physical education better.

## 3.2 System Architecture

In order to prevent the disclosure of relevant important information in the school website, the physical education teaching system of colleges and universities will use HTTPS protocol, which is an HTTP channel to protect the security of the school website. The channel consists of many layers, of which the most basic layer is SSL. SSL is an important content of physical education in Colleges and universities.

Conformity of requirements: correctness and completeness [12]; Functional and non functional requirements; Overall performance (memory management, database organization and content, non database information, task parallelism, network multiplayer operation, key algorithms, impact of interfaces with network, hardware and other systems on performance); Operation manageability: it is convenient to control system operation, monitor system status and handle errors; Simplicity of communication between modules; Different from maintainability; Compatibility with other system interfaces; Compatibility and performance with network and hardware; System security; System reliability; Business process adjustability; Adjustability of business information; Ease of use; Consistency of framework style.

Development manageability: it is convenient for personnel division of labor (module independence, load balance of development work, schedule optimization, prevention of the impact of personnel turnover on Development), configuration management, rationality and moderate complexity of size; Maintainability: different from operation manageability; Scalability: upgrade, capacity expansion and expansion performance of the system scheme; Portability: different client and server; Compliance with requirements (consideration of the organizational structure of the source code).

It is actually an identification mark, which is mainly used to transmit some important data. Its main functions are:

(1) Authenticate users and accurately send data to specific devices;

(2) Encrypt the important data to be transmitted to avoid intermediate loss.

Under the college teaching network platform, we need to choose the appropriate architecture to promote the smooth operation of the platform. Users can find the required relevant data through the browser, and some data can be realized through a specific browser. The main reason for choosing this structure is that it can enable students or teachers to find the information they need in time, focus on relevant things, save teachers a lot of time and improve teachers' work efficiency. The system structure is mainly composed of six parts. The first part is the operating system, which is the most basic part and an important part. It mainly adopts the windows serve 2003 system, which can ensure the reliability of the system; The second part is the database system layer [13]. By giving full play to the functions of Windows NT and continuously improving the stability and configuration of the system structure, the relevant information and subject settings of students can be more detailed and reasonable; The third part is the IIS server, through which students can collect all kinds of data and information. The fourth part is the application service layer, in which the school physical education system mainly uses technical means for the exchange and use of information and data; The fifth part is the network interaction layer, which mainly includes other websites related to China Mobile and China computer network; The sixth part is the user client, which is mainly open to students and teachers. Users can exchange and use relevant data by using this function.

The system structure of the school is shown in Fig. 3.

## 4 Functional Modules of Sports Online Education Platform

From the perspective of function, the college physical education network education platform is composed of multiple modules, mainly including user management module, network course management module, question bank maintenance and management module, real-time examination module, paper evaluation and review module, system management module and user health information collection and analysis module [14]. The algorithm structure of physical education platform is shown in Fig. 4 below.

(1) User management

The management of users mainly depends on different permissions. The permissions of system administrators are relatively large, which maintains the stable operation of the

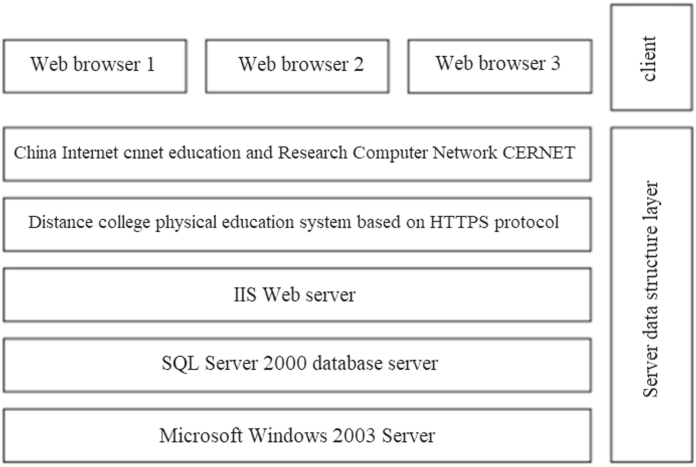


**Fig. 3.** System structure of College Physical Education Network Education Platform

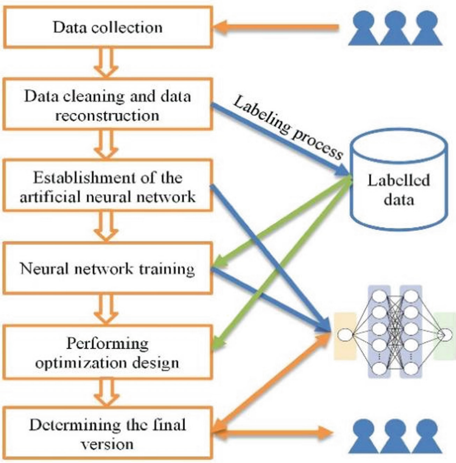


**Fig. 4.** Algorithm structure of physical education platform

system; Teachers mainly manage students' learning process and teaching stage planning; Students have only basic authority to manage the progress and knowledge of teachers.
(2) Network course management
Network course is a novel teaching method. Compared with the previous media, network course has the characteristics of dynamic information and interaction. Network course management is mainly introduced from five aspects. 1) The progress of online courses is completely completed according to the customization of students' teaching teachers, and the corresponding knowledge points are introduced for learning according to the normal progress; 2) The use of multimedia in teaching increases the interest of teaching

and improves the learning efficiency of students; 3) Each knowledge point has a link. If you are interested, you can click to understand it, which can be used effectively.

Stimulate students to listen carefully and improve students' attention; 4) It is fully interactive during teaching, and problems can be solved through real-time dialogue and message. The establishment of this system plays a very important role in the progress of students' learning.

(3) Item bank maintenance and management

Question bank is the basis of examination. The maintenance and management of question bank plays a great role in the examination system. Doing a good job in the maintenance and management of question bank plays a very important role in the addition and change of test questions.

(4) Real time examination management

The teacher will divide the learning into several stages according to the process of the content in the class. After each stage, the corresponding knowledge points will be tested online, and the students will be online_ Take the exam as your grade.

(5) Marking review

The function of the open examination system is relatively powerful. It can directly mark and evaluate the papers intelligently on the Internet. For some objective questions, the open examination system is directly used. After the candidates submit the answer results, the system will directly mark and score according to the standard answers, and the results can be obtained after the examination, which greatly improves the work efficiency of teachers and saves a lot of time [15].

(6) System management.

The management of the system mainly includes three aspects: managing users, permissions and question types; It is mainly to manage users and question types, maintain the use and management authority of students and teachers, and maintain the normal operation of the system.

(7) User health information collection and analysis

Users' health information mainly includes students' basic data, exercise habits and interests, physical test data and psychological test data. After these data are collected, these information can be sorted and analyzed through the sports network information platform of colleges and universities, which can effectively draw conclusions. These conclusions play a great role in teachers and users of scientific research.

## 5 Conclusion

With the vigorous development of multimedia network technology, traditional school education is facing new opportunities and challenges. This challenge is not only reflected in the reform of teaching mode, means, curriculum and materials, but also in the reform of teaching thought and teaching concept. Reforming teaching methods and means, renewing teaching concepts and carrying out network education have become the requirements of the times. It can be concluded from the above that the establishment of a perfect college sports network information platform plays a great role. By using cloud computing technology, we can orderly sort out the health information, health information guidance, sports theory teaching and assessment information of student users, and effectively improve the proportion of sports theory knowledge in Colleges and universities, Meet the needs of College Students' targeted learning of physical education theoretical knowledge and classroom practice, and cultivate students' comprehensive ability, so as to achieve the purpose of reforming the college physical education curriculum system.

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