Design and Implementation of College Physical Education Teaching Information System Based on Java

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Abstract

Sports online teaching management has greatly improved the efficiency and effectiveness of school PE teaching, which is a great change in the traditional model. With the development of information technology and the popularization of network communication, it has provided a solid foundation for colleges and universities to establish sports network teaching. Due to the specialties of sports science, the development of sports network teaching is slow. With the increasingly prominent shortcomings of traditional physical education and the rapid development of IT technology and network communication in recent years, web-based physical education has also gradually developed. Against the background of the rapid development of information technology and network communication, aiming at the disadvantages of the traditional physical education in colleges and universities and the advantages of sports network teaching, this article puts forward the plan of building a sports network teaching system. The purpose is to establish a suitable teaching management system, the system can not only bring teachers teaching convenience, but also improve students’ learning efficiency and further promote the sharing of learning resources. System uses database technology and Java technology, integrated management of relevant information, and ultimately the entire system.

Keywords: Physical education, Information system, Management system, Java.

1. INTRODUCTION

In recent years, with the rapid development of computer technology and network communication technology, the combination of the two has gradually been introduced into the field of teaching, and promoted the transformation of traditional education. In contemporary China, people's living income levels continue to improve. Even in remote rural areas, the popularity of computers also have a certain scale. The continuous improvement and low cost of national communication network infrastructure make it possible for schools to carry out network teaching (Zhou, 2016). With the support and assistance of national policies and funds, all the major universities in China have established their own teaching network, and some colleges have realized the online teaching of major courses. Because of the higher teacher student interaction and practicality, it is more difficult to realize the sports network teaching than the general teaching subjects. Moreover, the status of sports subjects in the traditional education of domestic universities is not high, it is difficult to arouse the attention of the majority of teachers and students. Therefore, the pace of the development of sports network teaching has been limited. At present, the university sports teaching still stays in the classroom and the school playground. Attention to physical education from all walks of life is bound to cause a revolution in physical education (Zheng et al., 2016). With the establishment and improvement of the school network platform, the vast majority of students share the benefits and value of network teaching to bring them, the realization of sports network teaching has gradually become the major universities and the pursuit of teachers and students.

Social attention and economic development provide good opportunities for sports network teaching in Colleges and universities, but the realization of sports network also depends on the rapid development of information technology. The emergence of electronic books, multimedia courseware and online video play system provides the basis for the realization of sports network teaching (Wei, 2016). With the support of multimedia technology, the network platform of physical education teaching has become more advanced and reasonable, which provides good experience and convenience for students' online learning (Di and Hongye, 2017). Under the background of teaching reform and social science and technology development in Colleges and universities in China, the formation of sports network teaching mode is inevitable. Based on the detailed feasibility and demand analysis of physical education teaching system and the characteristics of physical education teaching, this paper analyzes...
and designs the university PE teaching management system based on Java in order to meet the needs of the development of colleges as well as to fill the time and space constraints of traditional physical education.

2. JAVA TECHNOLOGY

Java is a general term of Java object oriented programming language (hereinafter referred to as Java language) and Java platform launched by Sun Microsystems. Java was jointly developed by James Gosling and colleagues, and was officially launched in 1995. Java, originally called Oak, was designed for embedded chips for consumer electronics in 1991. It was renamed Java in 1995 and redesigned for the development of Internet applications (Zhao-Hu et al., 2016). The HotJava browser (supported by Java applet) implemented with Java shows the charm of Java: cross platform, dynamic Web, Internet computing. Since then, Java has been widely accepted and promoted the rapid development of Web, commonly used browsers support Javaapplet. On the other hand, Java technology has also been updated. Java has been very popular since its launch, and it has developed rapidly, which has a strong impact on C++ language. In the global cloud computing and mobile Internet industry environment, Java has more significant advantages and broad prospects (Bai et al., 2016).

Java consists of four aspects:

Java programming language, that is, grammar.

Java file format, which is the suffix of various folders and files.

The Java virtual machine (JVM), the interpreter for processing *.class files.

Java application program interface (Java API).

Java is an object-oriented programming language. It not only absorbs all kinds of advantages of C++ language, but also discards the concepts of multi inheritance and pointer which are difficult to understand in C++ (Qian, 2017). Therefore, Java language has two features: powerful and easy to use. As a representative of static object oriented programming language, Java language implements object-oriented theory very well and allows programmers to program complex programming in an elegant way of thinking.

Java has the characteristics of simplicity, object oriented, distributed, robustness, security, platform independence and portability, multi thread, dynamic and so on. Java can write desktop applications, Web applications, distributed systems and embedded system applications (Zhu B., 2016).

3. DEMAND AND ANALYSIS OF PHYSICAL EDUCATION MANAGEMENT SYSTEM

3.1 System requirements analysis

System requirements analysis is to fully understand the role of the system to be built, that is, to solve what the user's problems, what resources to provide users, demand analysis is one of the important work of information system construction. To do a good job of system requirements analysis, it is necessary to fully investigate the system construction side of the requirements and user needs (Liu et al., 2016). Based on a combination of the two, a demand analysis report is written that provides the basis for the planning and design of the new system. In this study, when doing needs analysis, the system needs are divided into functional needs and non-functional needs of the following two types of needs analysis.

System functional requirements are the requirements generated to meet the main business functions of users, and this kind of requirements is essential. When a class of functional requirements is missing, the user of the system affects the integrity of the user's operation process (Shen et al., 2015). This paper divides sports network system into eight functional requirements, as shown in figure 1. Next, explain each use case.

(1) Information release
This function is used to real-time sports discipline related information, such as meetings, contributions, policy changes as well as the domestic and foreign research on sports teaching and other related information dynamic focus.

(2) Online courses on demand

This function mainly supports the user login system, according to their needs, on-demand corresponding courses, and can play the curriculum smoothly and smoothly.

(3) Communication and answering questions

This function can be used by students to ask questions and answer questions when they are learning online. You can also communicate with your teacher on topics you care about. Communication and answering can be real-time or delayed.

![System use case diagram](image)

*Figure 1. System use case diagram*

(4) Upload teaching resources

This function is suitable for teaching courses, teaching materials and teaching beneficial resources uploaded, such as office office software, literature and test materials.

(5) Curriculum management

The curriculum plan and all kinds of courses offered by the system should be formulated by this function. According to the school physical education plan, teachers can set up various courses in the physical education teaching system for students to choose and learn.

(6) Online course selection and result query

Students can log in the physical education system for elective courses, in accordance with the relevant provisions of the school, under certain requirements to choose their own learning courses. After selecting the
students, the teacher enters the PE teaching system according to the final exam results of each student. Students can login at any time to check the final results of their own courses.

(7) Data analysis

Data analysis mainly carries out a comprehensive analysis of the students' scores in each course, such as the number of students who divide each section. It helps teachers to understand the final learning effect of the students who teach the course, and provides the basis for the adjustment of the curriculum plan and teaching method.

(8) System management

System management is to manage the information of the whole system, including teacher, student basic information management, system parameter initialization and authority management.

3.2 System process analysis

![System administrator operation flow chart](image)

Figure 2. System administrator operation flow chart

System process is a sequence of activities in which the user takes a strict sequence to achieve the intended goal. System process analysis is to sort out the redundant work in the management, retain the original efficient process and optimize the low efficiency process. The existing users of the system include teachers, students and system administrators. The parameter initialization of system and responsible for the daily maintenance management system; the teacher can log on the system performance input, data analysis, curriculum setting and online answering; students can realize the system course selection, query results, teaching VOD and online question (Li et al., 2015). Because of the business process of the system is more, for the sake of simplicity, only in this system administrator, teacher and student three kinds of system user operation process is analyzed. The operating flow of the system administrator is shown in figure 2.

After the teacher enters the physical education teaching system, the main operation process includes: arranging and setting up the course, inputting and analyzing the students' scores, and answering the questions in real time.
or delayed. The process of students using the sports teaching system mainly includes course selection, score query, video course learning, online questioning and communication.

4. THE OVERALL DESIGN AND IMPLEMENTATION OF SPORTS TEACHING MANAGEMENT SYSTEM

In this chapter, we first analyze and design the overall functional modules of the system, and design the relationship between modules and modules, the relationship between modules and the overall system. The entities, attributes, W and each function of each module are refined and materialized by E-R diagram. According to the specific function of each module and the attribute of the entity in the module, the detailed design of the module is carried out, and the result of the design is run. The corresponding running graphic window and the corresponding development code of the implementation window are displayed. Through the analysis of the demand of college sports teaching management system, we build the overall functional structure diagram of the university sports teaching management system, as shown in figure 3.

As shown in figure 3, there are four modules in the system, including competition management module, physical fitness test management module, sports teaching management module and user management module. Each module contains 1-3 sub modules to realize the function, so as to ensure the normal operation of the whole physical education teaching system. The function of some sub modules can be operated by both teachers and teachers. Because of the size of knowledge permissions, some sub modules can only be operated by teachers or administrators. Each module is connected, and the internal data is shared, but the independence between modules is much greater than the coupling between modules. So as to better maintain the stability of the system.

4.1 Management module of competitive sports

Competition management module is mainly for colleges and universities to carry out competitive events, before the game, the module can effectively set and adjust the difficulty of competition program, the number of participants and record competition registration personnel related information. After the game, the system can input and save the athletes' results, according to the overall score, the system will give the corresponding recommendations. This suggestion can further guide the teachers to arrange the relevant sports events in the future, so as to improve the students' physical integration.
4.2 Fitness test module

Physical fitness test module is mainly to test the physical constitution of the college students, through the test data to master the physical condition of students. Physical fitness test items are long jump, body flexion, vital capacity and so on. Test score management is mainly measured results entered by the students into the system, the level of division. Level is divided into, good, medium and qualified, through the level to determine whether the physical fitness of the classmate. If unqualified, inform the classmate, retest a month later. If you do not pass, cancel the classmate's evaluation of eligibility.

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4.3 PE teaching module

The teaching module of physical education is mainly the management of daily physical education, which is divided into management PE course and student achievement management. The physical education curriculum management is the daily sports curriculum arrangement, the schoolmates elective course, the class attendance situation as well as the final sports examination way and so on daily work. Student achievement is the end of each semester through physical examination to the students a score. This score is the results of the usual results and final assessment results were added in proportion. At the same time input system announced, if there are objections, you can contact the teacher I related processing.

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<td>StudentID</td>
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4.4 User management module

User management module is mainly to allow users to change the password. Because sometimes forgotten password, login does not go in, will result in some students can not find results is very worried. In order to solve this problem, the students are allowed to retrieve the password or modify the password by email or SMS after forgetting the password. At the same time due to the different teachers to take over the different projects, teachers also need to change the password, so good management, it is not easy to leak some important documents and related information.

5. CONCLUSIONS

With the continuous development of society and the progress of science and technology, the management efficiency of higher education also increases. In recent years, with the continuous expansion of the scale of colleges and universities and the increasing number of students, this will inevitably make the daily management of colleges and universities become more complex. It provided high management efficiency of university teachers and students of daily life and work has extraordinary significance. In all aspects of education management in Colleges and universities, physical education is one of the important and necessary compulsory items. Throughout the national university sports teaching situation, the quality of physical education management in Colleges and universities still has a huge room for improvement. At present, it is an effective way to improve the quality of college education management by developing and designing an efficient physical education teaching management system. At the same time, the development of sports teaching management system can make the college sports teaching management work tends to be efficient and normative. The system
designed by this subject can manage the business of college physical education teaching management scientifically, and make the management work efficiently. Through the test, the basic functions of the system can meet the requirements of the teachers and students in the teaching management of physical education.

REFERENCES


Wei X. (2016). The design and application of physical education teacher evaluation automation system, Electronic Design Engineering.


