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Track and Field Teaching Management System Based on B/S Architecture

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Abstract: The ability to send data online when computers are networked allows immediate sharing of data and avoids duplication of work, thus making physical education a standardised management that can positively improve the efficiency of administration. The aim of this paper is to investigate the design and implementation of an athletics teaching management system based on a B/S architecture. Firstly, it introduces the development history of the B/S architecture-based athletics teaching system, summarises the relevant research on the management information system for athletics teaching, and explains the development value and development significance of the system. Secondly, the reasons for the difficulties in teaching track and field special classes are analysed, the general design principles of the track and field teaching management system are introduced, and the detailed structure of the system data flow analysis and database design are described. Finally, the system design and implementation work is shown to implement the key algorithms for document management and key codes for grade management of the system. The results show that the system can help physical education teachers to manage athletics teaching more effectively.

1. Introduction

Modern teaching methods are a process of conveying information to students in the form of a combination of text, graphics, images, sound, animation and video. Not only is it informative, but it can be boiled down to simple, difficult and static; complex and insipid teaching content can be made vivid and interesting, stimulating students' interest and enthusiasm in learning [1-2]. If modern teaching methods are widely used in the teaching process of athletics courses, we can make students establish the correct exercise methods, so we should widely use modern teaching methods in the teaching process of athletics courses [3-4].

The use of modern teaching technology is relatively popular in colleges and universities, but its application in the teaching of track and field technology in physical education is not common, and the use of modern teaching technology in the process of teaching track and field technology is even less. Combining modern education technology with the teaching of track and field technology can make up for the shortcomings of traditional teaching. Some scholars have analysed the outstanding problems of the current integration of modern information technology and physical education teaching, and on this basis, discussed how to deepen the teaching reform and optimise the structure of physical education teaching through the integration of modern information technology and physical education teaching. It has stimulated students' interest in learning and achieved good teaching effect[5]. Some scholars elaborated on the scientific evaluation of high school physical education teaching quality through logical reasoning, proposing that the implementation of high school physical education teaching quality evaluation must be done by:using the latest athletics curriculum objectives to define all athletics teaching concepts, insisting on what is effective athletics teaching, establishing a scientific view of high school athletics teaching quality, and establishing a scientific evaluation index system and evaluation model[6-7]. Some scholars have also proposed a design scheme for a university teaching management system based on C/S architecture. The implementation methods were discussed in terms of overall system design, system development environment, system function modules, database system selection and system security [8].

In this paper, an efficient and effective multimedia teaching management system is proposed for the current status of teaching management technology that is difficult to use in physical education classes. And through the implementation of this system, it proves that the wide application of modern teaching technology in the management of athletics teaching can help teachers to analyse problems, solve them, improve students' physical education and sport abilities and enhance teaching effectiveness.

2. Research on Track and Field Teaching Management System Based on B/S Architecture

2.1. The Important Role of the Athletics Programme

(1) Fitness function

Students can improve basic physical skills such as walking, running, jumping and throwing when they take athletics courses. It promotes the development of various organs and functions of students, and can fully develop physical qualities such as speed, strength, endurance, sensitivity and flexibility.

(2) Competitive function

Modern society is a competitive society that is becoming increasingly competitive as it progresses. The study of physical education can raise students' awareness of fair competition, enable them to better understand the Olympic spirit of "faster, higher and stronger", and better meet the needs of society.

(3) Basic functions

Many sports cannot be separated, running, jumping, voting, etc. In order to better learn other technical courses, students of physical education must first take athletics courses to build a solid foundation for their future work.

(4) Educational function

During the teaching of athletics, students are subjected to certain physical and psychological loads and must also comply with certain requirements and regulations, which are conducive to the development of good thinking and psychological qualities. For example, long jump helps to cultivate the quality of rigidity, sprint helps to cultivate the indomitable fighting spirit, high jump

helps to cultivate the character of tenacity and stubbornness, long run helps to cultivate the character of tenacity and diligence, throwing events help to cultivate courage and confidence, relay helps to cultivate the quality of collective cooperation and common struggle.

2.2. Reasons for the Difficulties Faced in Teaching Athletics-specific Classes

With the restructuring of the physical education curriculum, many colleges and universities have excluded athletics from their physical education programmes. Many teachers tend to focus on the content and the sport itself; however, his own basic theory is not sufficient to explain the basics and practices of each sport to students in detail. Compared to other sports, athletics courses are very monotonous and do not motivate students nor do they increase their attractiveness [9-10].

2.3. Principles of the Overall System Design

The development of the system should take into account the following basic principles:

(1) To give full consideration to the problems that exist in the management of physical education and to ensure the integrity and openness of the system design.

(2) To proactively keep the system evolving and to update and maintain it in the future, taking into account the principles of system scalability and maintenance factors.

(3) The principle that the project is based on an advanced nature and ensures practical objectives.

(4) The safe and stable operation of the system is the first condition and the reliability of the design should be considered.

2.4. System Functions

(1) Physical Education Information Enquiry

Sending information to students is their most basic duty. The information sent is not limited to athletics, but also includes a comprehensive screening and distribution of all sports information in the school so that students can use the system to find out the information they need, including the various sports competitions that have recently taken place in the school, the use of the various sports venues in the school, etc [11].

(2) Learning database for teaching athletics

An important feature in the teaching of athletics is the creation of a comprehensive multi-media learning database, including video, audio, images and text, which should include details of over 40 sporting events such as running, throwing, running and all-rounders. Teachers and students can easily access these materials for daily teaching and learning [12].

(3) Sports news push

In addition to the daily information on school sports, the system is updated daily with the latest sports-related news, especially on athletics, so that students can have access to the latest, comprehensive and professional information on athletics, increasing their interest and enthusiasm in athletics.

3. Design and Research of Track and Field Teaching Management System Based on B/S Architecture

3.1. Three-tier Browser/Server Architecture (B/S) Structure

In the deployment options for this system, the developers use a three-tier B/S architecture based on a browser, an application logic server and a database server, which is the more mature of the

current software development architectures. the B/S model allows the user to implement various data behaviour operations that are completely browser dependent; on the other hand, the main system transactions take place on the server side. The user sends system data requests via the browser. The server completes the data request submitted by the user and delivers the behaviour of the data operation after the terminal based on the data information, as shown in Figure 1.

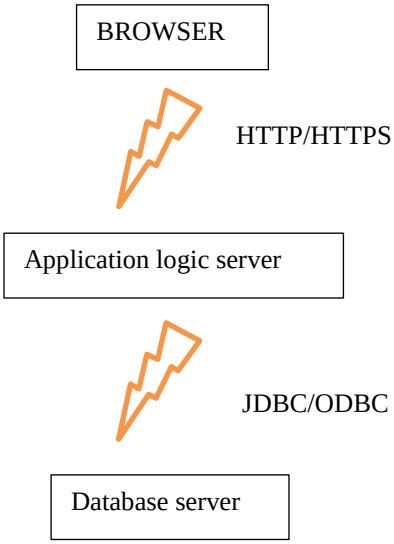

Figure 1. B/S system architecture

3.2. Database Design

For the specific development of this athletics teaching management system, a development version of MySQL 5.5 was chosen (to be converted to a server version for later system deployment to ensure system stability.) The MySQL installation package can be legally downloaded from the web as a free version and can start with a simple setup (setting server name, root password, etc.). During database development, developers cannot rely on the pure command development provided by MySQL to manage the development of system data. The system developer chooses Navicat to develop and manage the MySQL database system, a free third party database management GUI tool.

The development of the sports management system database cannot be done immediately after the MySQL development environment is completed. Developers should first complete the design and optimisation of the system database and reduce the redundancy of data due to inadequate database structure after system development. The most important step in the design of the system database is to summarise the data information that the system needs to handle, form a basic table structure and then model the database so that field associations between data tables and elimination of redundant fields can be completed during the compilation process.

The athletics teaching management system was designed with three management functions including backup of database information (automatic and manual), restoration of database information through backup files (done directly through SQL commands), and backup data management, as shown in Figure 2.

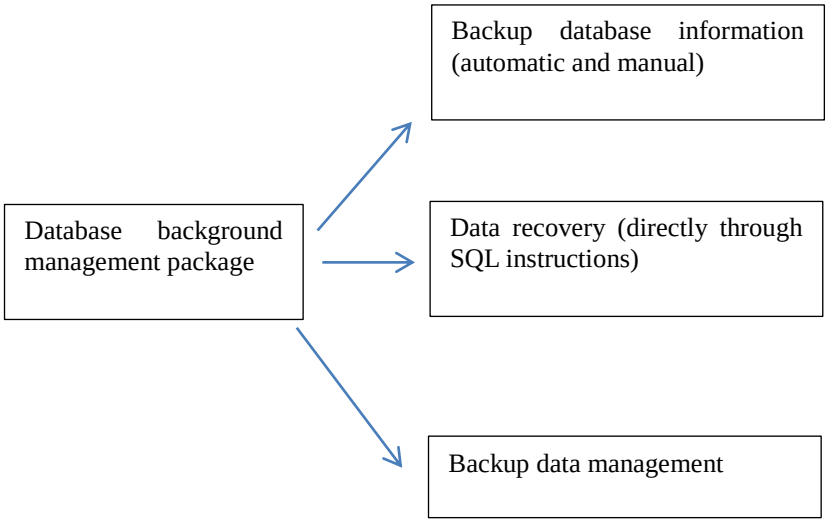

Figure 2. Structure diagram of system database management function package

4. Realization and Analysis of Track and Field Teaching Management System Based on B/S Architecture

4.1. Implementation of Key Algorithms for System Document Management

In the design of this system, there will certainly be some complex algorithms to be solved by the developer during the analysis and design of the functional implementation of specific functional modules. Some of the algorithms and the corresponding code can be obtained by reference or by directly using the research results of others, but inevitably the developers themselves will be required to complete the development of specific algorithm applications during the development of this system. The two main algorithms used in this system are the Chinese word separation algorithm and its application, and the paging algorithm and its application to the display of page data. The Chinese word separation algorithm used in this paper is represented by an algorithmic flowchart, as shown in Figure 3.

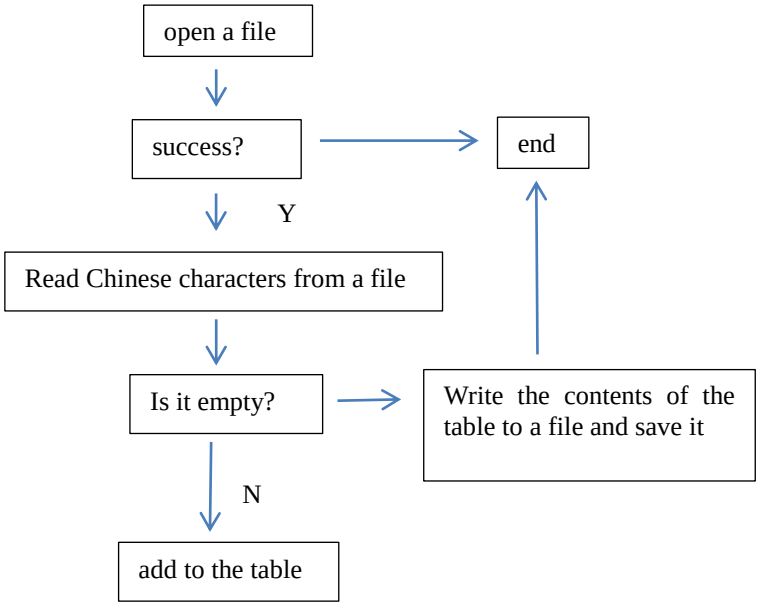

Figure 3. Chinese word segmentation processing algorithm flow

Statistical language models commonly used in Chinese word segmentation are based on Bayesian probability theory. Bayesian formula:

$$P(B|A) = \frac{P(A|B)P(B)}{P(A)} \quad (1)$$

Applying this formula to natural language processing, B represents a word segmentation result, and A represents the sentence being processed. Since PA() is the probability that sentence A appears, regardless of how the sentence is divided, it can be regarded as a constant, and the formula can be transformed into:

$$P(B|A) \propto P(A|B)P(B) \quad (2)$$

In Chinese participles, P(A|B)P(B) can be thought of as the likelihood of a word phrase forming a sentence multiplied by the likelihood of this participle method. Since a sentence can eventually be formed regardless of which sub-phrase is used, P(A|B) = 1 always holds:

$$P(B|A) \propto P(B) \quad (3)$$

Finding the best clause is a matter of finding the clause combination for which P(B|A) is the largest. The problem translates into finding the string of words with the highest probability of forming a sentence.

4.2. Achievement of Performance Management

Results are entered by specialised staff and login is required before operation to ensure the authenticity and validity of the data. Depending on the event to be entered, all competitors in that event are displayed. The results are entered and automatically ranked in preparation for final admission. There are three different types of entries: track records (non-relay), field records and relay records. Field and track results should be entered in their respective formats. Adding athletes' results, modifying results and deleting results. When adding a sport, basic information about the result is required. If there are any errors, a system error will be indicated. After a successful addition it will automatically jump to the list of sport scores and you can view or delete the newly added scores. The following code is the processing logic when adding scores:

```
protected void Button1_Click(object sender， EventArgs e)
{
string sql;
sql="insert into chengji(bianhao，xingming，bisaixiangmu，leixing，chengji)
values('"+bianhao.Text.ToString().Trim()+"'，'"+xingming.Text.ToString().Trim()+"'，'"+b
isaixiangmu.Text.ToString().Trim()+"'，'"+leixing.Text.ToString().Trim()+"'，'"+chengji.T
ext.ToString().Trim()+"') ";
int result;
result = new Class1().hsgexucute(sql);
}
```

Some grades are entered as shown in Table 1, and the grade management view is shown in Figure 4:

Table 1. Partial score entry form

Competition items	Student ID	Ranking	Score
Sprint	001	68	74
High jump	002	15	92
Long distance running	003	33	81

Figure 4. Grade management

5. Conclusion

A physical education teaching management system based on a B/S architecture enables teachers to take full leadership, improves their ability to discriminate teaching according to their abilities and increases the efficiency of teaching management. For reasons of time, money and equipment, this study has only been carried out to detail student performance management with good results. It is hoped that schools will continue to adopt modern teaching methods, i.e. a sports management system based on a B/S architecture, and that other sports modules will be tested and studied for progressive review and improvement. Universities need to make full use of modern teaching methods, i.e. B/S architecture-based PE management systems, to make up for the shortcomings of traditional management methods, improve the quality of teaching and learning, and effectively promote the application to create an environment.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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