



Application of Data Mining in Physical Education Experiment Teaching Guidance

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Abstract. The application of data mining in physical education experimental teaching guidance can situation and performance in experimental courses, and provide personalized teaching guidance and feedback. By analyzing students' experimental data and behaviors, data mining can discover their learning patterns, difficulties, and potential, and provide data-driven teaching strategies and resources for teachers. Through data mining technology, teachers can analyze students' data indicators in experiments, such as action data, time data, energy data, etc., in order to identify students' strengths and weaknesses in different actions or techniques, and help them provide targeted feedback and guidance. Teachers can use data mining techniques to find students' learning patterns, such as their mastery speed and process of different experimental skills, so that they can conduct differentiated teaching based on students' learning patterns. In summary, the data mining in physical education experimental teaching guidance can provide teachers with a comprehensive understanding and students' learning situation, and help teachers provide personalized teaching guidance and feedback. This will promote the improvement of students' experimental abilities and the optimization of learning outcomes.

Keywords: Web technology · Data mining · Physical education · Teaching practice

1 Introduction

The progress of computer and NT not only for university, but also puts forward higher requirements for students' physique. In sports, there are many kinds of data at different stages. The sports industry is using these for improving performance, avoiding injury, organizing, researchers, coaches, players, game planning, decision-making and even forecasting purposes.

With the continuous, many experts have studied sports. For example, association rules in curriculum construction, analyzed the relationship between gender and physical education, and discussed the influence of gender factors on PE teaching practice. It is suggested that the major of physical education should focus on pedagogy and train qualified reflective PE teachers. We strongly recommend that more human resources be invested in teaching practice throughout the teacher program. From the teaching practice, extract the elements different from the program, use the idea of DM to provide decision-making basis for PE teaching, trying to reinterpret. The practice of PE reflects strongly the influence of PE on the theory of physical culture while investigating the practice process of extracurricular physical culture. In of school PE management, this paper puts forward the school, and constructs. Using BD mining the allocation of school SM resources, using the information of school SM resources, using the school sports md. In this paper, fuse school physics md, and a physics md is. The school physics management are analyzed by using. The classification and recognition of neural network model improves. The scientific DM of sports performance management is introduced into the new framework. Taking association rule mining as an example, this detail the method of scientific management of sports performance by using DM technology, and briefly analyzes the mining results [1]. Some experts have studied the feasibility of applying DM tools and technologies to the field of sports, especially in the mining of sports competition itself. This paper introduces several typical applications of BD mining visualization. Based on DM technology classification learning decision tree, this the quality of life of PE teachers and their views on the education system. This of DM at home and abroad, in sports competition technology and tactics analysis, national fitness monitoring and sports training. This paper introduces DM technology into scientific management of sports achievements, and framework of scientific management of sports achievements. Taking association rule mining as an example, this the method of scientific management of sports performance by using DM technology, and briefly analyzes the mining results [2]. Some experts have also studied the sports. Through the DM and sorting of sports research literature, using the research method of sports statistics, the sports research literature is analyzed from the aspects of SP, competition, training, application, teaching, review, teaching and so on. The results show that the current on simple theoretical analysis, while the establishment and application of sports field database is relatively simple, which leads to the one sidedness of the research. In the aspect of data, the computer as the database platform, adopts the three-tier architecture to realize each functional module of sports performance management, and uses the analyze the correlation of the input sports performance. This principle of DM, and applies critical to predict the performance of the system [3]. Although there are many achievements in PE research, there are still some deficiencies in the DM in PE practice teaching guidance [4].

In the application of DM in guiding PE practice teaching, this paper studies DM and PE practice teaching, and finds the support. The that DM to the development of PE practice teaching.

2 Method

2.1 Data Mining

(1) The concept of DM technology

DM technology refers to data mining technology, which is a method and tool for mining valuable, implicit, and unknown knowledge and patterns from a large amount of data. Data mining is the discovery of potential patterns, correlations, trends, and anomalies from large-scale datasets through the application of technologies and algorithms such as statistics, machine learning, and pattern recognition [5]. DM technology involves multiple steps, including data preprocessing, feature selection, data model selection and construction, model evaluation and optimization, etc. It can be applied in multiple fields, such as business, healthcare, finance, education, etc. [6]. In these fields, it can help enterprises and organizations discover market trends, predict demand, improve decision-making efficiency, and improve service quality. Through DM technology, useful information and knowledge can be extracted from massive data, helping people make more accurate predictions and decisions [7]. It can help discover patterns and trends hidden behind data, conduct intelligent data analysis and prediction, and effectively support business development and problem solving. Data mining technology not only has theoretical research significance, but more importantly, it has broad application value in practical applications, providing data-driven insights and decision support for various industries [8].

(2) Application of DM in sports

The results of DM are applied to the daily sports training and competition, and the previous steps are modified according to the implementation situation until the reasonable results are obtained [9]. At the same time, the idea of this model is applied to other projects to realize the reuse of knowledge [10]. Before the emergence of DM, data was only used as the most basic query. DM technology is to obtain deeper information from data [11]. With the massive growth of data, the value of DM has been greatly improved. DM technology can classify and predict students' behavior. For example, the teaching quality evaluation, poor students' judgment and college students' mental health can help efficient managers make more effective decisions.

2.2 Physical Education Practice Teaching

(1) Physical exercise

If the basic skills are practiced purposefully and systematically, the movements will tend to be automatic and reach the skill level. These skills must be based on solid theories. Motor skill is a series of motor actions that students can complete through learning. Through repeated practice, it forms an automatic, perfect and creative action system. Therefore, it has a certain fixed form and variable form, different sports need different motor skills. PE is reflected in people's physical and mental adjustment, which can meet

people's pursuit of their own physical beauty, because many factors of human beauty are closely related to sports. People understand information, learn knowledge, enrich life and fill psychological space through TV and Internet. Sports is not only a fashion, but also has penetrated into every family and become an indispensable part of people's daily life.

(2) Physical education practice teaching

In the process of teaching, there are still some deficiencies in the selection of teaching content, teaching organization form, teaching methods and so on. The evaluation in PE curriculum: Zhang Qingxin pointed out the following problems in the process of putting forward the problems and skills in the selection of sports and health knowledge content: (1) lack of guiding and practical consciousness for students to carry out lifelong sports. The teaching content of self exercise is not correct; (2) the bad life style and mental health teaching in the selection of teaching content are not paid attention to; (3) the knowledge of health education is not well integrated into PE, but is bound by the latter. In the new curriculum standard, the goal of health education should be realized in PE. In the process of implementation, in order to achieve these goals, PE teaching is constantly changing. However, in terms of teaching management, most schools adopt a modular approach to health knowledge teaching in theory class, while only a few schools combine health knowledge teaching with PE practice teaching.

(3) College Physical Education

From the particularity of sports practice and sports teaching, the development of sports informatization in Colleges and universities is inseparable from sports classroom practice teaching. To develop in the field of network teaching, we must actively explore and try in blended learning. The research and practice of blended learning should be different from the development of other disciplines. As a kind of education, PE as a kind of education, in addition to sports practice, there are other educational elements. Blended learning can have a variety of structures, and PE can develop blended learning in an all-round way.

2.3 Support

Suppose that a and B are two itemsets satisfying $A \in I, B \in I, A \cap B = \emptyset$. $A - > b$ means that a and B appear at the same time, and $\text{support}(a - > b)$ means the percentage of times that item set a and B appear at the same time in all transactions in transaction set D , as shown in formula (1).

$$\text{support}(A \rightarrow B) = \frac{\text{count}(A \cup B)}{|D|}. \quad (1)$$

Decision tree algorithm can get less unstable decision tree by segmentation technology. Set s with s sample data and have different value category attribute s , as shown in formula (2).

$$C_i(i = 1, 2, \dots, m) \quad (2)$$

Promotion degree means that when project set A exists, project set B also exists, but it also controls the popularity of project set B, as shown in Eq. (3).

$$\text{Lift}(A) = \frac{\text{support}(A, B)}{\text{support}(A) \times \text{support}(B)}. \quad (3)$$

3 Experience

3.1 Extraction of Experimental Objects

College Students' physique data aspects: physique measurement data, physique and sports performance. In terms of, due to different grades, different schools offer a wide range of courses. Therefore, this paper is mainly, management and analysis of the other two data. Through DM to classify and associate the students' physique data, timely grasp the, so as to help schools effectively improve the students' physique and health level. In the development of information mining system, the most important work is the design of base table in database. The base table can be simply said to be all the database objects in the database. In the base table, data is organized in the form of a spreadsheet. When designing a database, the responsibility of the system designer is to decide what kind of base table is needed, and the name, type, length, primary key, foreign key and index of the specific field of each base table.

3.2 Experimental Analysis

First of all, we should establish a sports data platform to provide information learning for scientific research. Secondly, popular sports tools and cute screen can eventually develop the integration of DM technology and motion simulation system. Through the system, scientifically formulate scientific lineup, counterpart, and for managers to plans and on-site for team members. The construction of the first simulated examination system needs to be solved through "finding problems, analyzing problems, solving problems, and building a system". Therefore, in the process of constructing the content system of PE teaching theory, we should first find out the system itself, that is, the system itself and the specific PE teaching process, then classify and comprehensively the problems, so as to clarify the problems existing in the content system theory. According to the construction principle of content system, the content system of PE teaching theory is constructed.

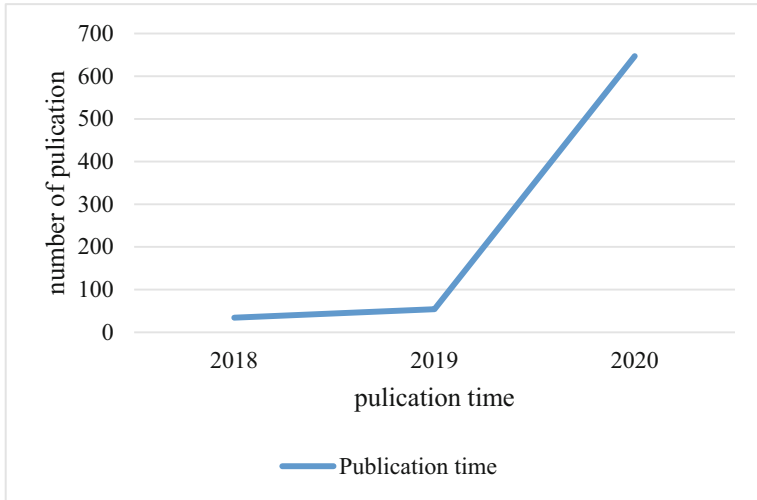
4 Discussion

4.1 Positioning of Sports Theory

Sports theory is the operation of university sports value, the excavation of sports cultural content and the orientation of sports learning content. The names of PE teaching materials in Colleges and universities were investigated, as shown in Table 1.

Table 1. P.E. Textbook Publication

Publication time	2018	2019	2020
Number of publications	34	54	647

**Fig. 1.** P.E. Textbook Publication

It can be seen from the above that in terms of the number of copies of university sports textbooks, 34 copies will be published in 2018, 54 copies will be published in 2019 and 647 copies will be published in 2020. The results are shown in Fig. 1.

It can be seen from the above that the number of copies of college PE textbooks is increasing with the growth of time. In 2020, the number of copies of college PE textbooks is up to 647.

4.2 College Physical Education Teachers' Views on College Physical Education Learning

On the role of college sports blended learning, mainly through the form of more suitable for college sports network education, college sports blended learning has led to the reform of PE teaching and sports learning methods, the development of college sports blended learning is shown in Table 2.

It can be seen from the above that the number of teachers who think that PE teaching is carried out in the form of network learning is 242, accounting for 34%; the number of teachers who think that PE teaching is carried out in the form of after class counseling is 152, accounting for 21%; the number of teachers who think that PE teaching is carried out in the form of blended learning is 325, accounting for 45%. The results are shown in Fig. 2.

Table 2. Network education forms that teachers think are more suitable for College Physical Education

Form	Number of people	Percentage
Network education	242	34%
After class guidance	152	21%
Blended learning	325	45%

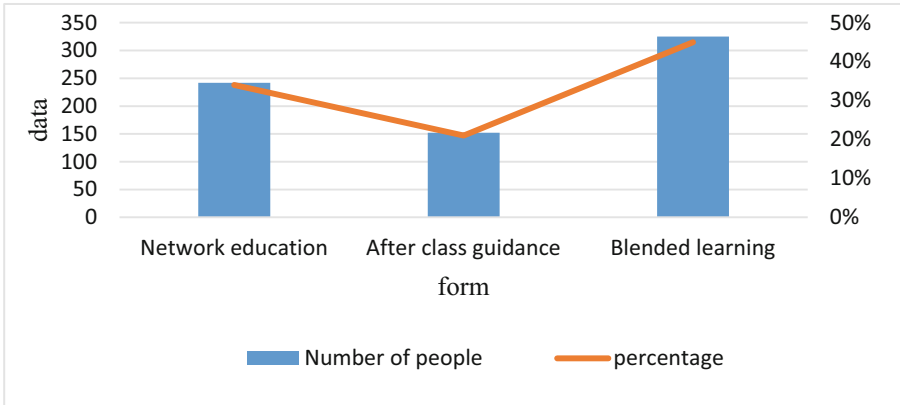


Fig. 2. Network education forms that teachers think are more suitable for College Physical Education

From the above, the teachers think that the maximum number of PE Teaching in the form of mixed learning is 325, and the number of teachers who carry out PE in the form of after-school tutoring is at least 152.

5 Conclusion

The application of data mining in physical education experimental teaching guidance can provide teachers and students with more comprehensive and accurate learning support and personalized guidance. By analyzing the large amount of data generated by students in experiments, such as action data, time data, and energy data, data mining can reveal students' learning patterns, difficulties, and potential. Data mining technology can help teachers understand students' learning and performance in experiments, such as accuracy, speed, and strength of actions. By analyzing these data, teachers can identify students' strengths and weaknesses in different skills and movements, and provide targeted feedback and guidance to help students improve and improve. In addition, data mining can also discover students' learning patterns and preferences, helping teachers differentiate teaching based on individual learning characteristics of students. By analyzing students' learning trajectories and performance data, teachers can provide personalized learning support and guidance to help them better explore their potential

and improve learning outcomes. Finally, data mining can also be applied to predict students' academic performance and progress in experiments. By analyzing students' data and behavioral patterns during the experimental process, predictive models can be established to help teachers predict students' learning performance, design appropriate teaching strategies and measures in advance, and thereby improve students' learning outcomes and grades. By using the formation of a series of strong association rules data for comparative analysis, so as to effectively analyze the data of physical education practice teaching, provide technical support for classification management, and provide reasonable, effective and reliable data for future physical education practice teaching directional data and suggestions.

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