Teaching and Evaluation of National Physical Education in Colleges and Universities Based on Data Mining Algorithm

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Abstract. Chinese national sports is one of the important ways to carry out physical education for college students. It has various forms, rich internal and external, strong cultural connotation and time value. At present, the curriculum of this major in Colleges and universities is basically martial arts, and other courses are only as elective courses. Coupled with the lack of teachers, the development of national traditional sports in Colleges and universities is not optimistic. Therefore, the teaching and evaluation of national sports in Colleges and Universities Based on data mining algorithm should strengthen the competitiveness, make national sports activities full of ornamental, select national sports items suitable for colleges and universities, and strengthen the construction of national sports talent team.

Keywords: Data mining algorithm · National sports · Physical education · Teaching evaluation

1 Introduction

Education quality is always the eternal theme of education and teaching research, and teaching effect is one of the most direct embodiment of teaching quality [1]. It is of great practical significance to build and improve the corresponding education quality evaluation system. Data mining is a professional technology that can automatically mine useful knowledge from a large number of data. It is a new field with great application value in database research. It integrates the theory and technology of database, artificial intelligence, machine learning, statistics and other fields. The data mining technology is introduced into the quality evaluation system of general education in Colleges for nationalities. This method can make a better quantitative analysis of the quality of general education in Colleges for nationalities. C4.5, K-means, SVM (support vector machine), apriori, EM (maximum expectation), PageRank, AdaBoost, KNN (k-nearest neighbor), Nb (naive Bayes) and cart (classification and regression tree) constitute the ten classic data mining algorithms. AdaBoost is a classical ensemble learning method, which has been successfully applied in other leading cities.

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2 The Present Situation and Problems of National Sports in Colleges and Universities

At present, there is still no complete system of national sports teaching materials published in the sports circle, and most of the teaching materials are martial arts. Although it is the backbone of this subject, the content of teaching materials for many years is mostly some boxing and some routines, which has little significance for the development of national sports. At present, the courses offered in Colleges and universities of this major are basically martial arts, and other courses are only as elective courses. Coupled with the lack of teachers, the development of national sports in Colleges and universities is not optimistic. In recent years, with the deepening of physical education reform in Colleges and universities, the importance of national sports continues to improve, from the excavation of the project to research, development has made considerable progress, but there are still many deficiencies [2].

2.1 The Development of National Traditional Physical Education in Colleges and Universities Lags Behind the Foreign Modern Physical Education

In many colleges and universities, extreme sports such as outdoor survival, orienteering, rock climbing, entertainment such as sports dance, hip-hop, roller skating, and confrontational sports such as taekwondo, karate, judo, boxing and fencing are popular with students, showing a good development trend. The traditional sports with national characteristics mainly focus on fitness, and its antagonism and challenge are not as obvious as the contemporary foreign sports. The national sports that can enter the classroom are mostly martial arts and Taijiquan, and the introduction of folk sports is extremely limited.

2.2 Some of the Contents of National Projects in Colleges and Universities are not Universal and Practical

From the current situation of national sports content selection in Colleges and universities, the selected items can basically meet the popularity, but some items lack popularity and practicality. For example, dragon dance and lion dance, the two traditional folk sports with the most national characteristics inherited by the Chinese nation for thousands of years, are not practical as the teaching content of colleges and universities. In addition, after the content of some traditional martial arts was set up, because the content was too old and not adapted, there were few students who chose courses and could not teach in class.

2.3 The Original Folk Sports Lack of Integration and Development

There are 56 ethnic groups in China, which have created hundreds of ethnic sports in their working life. Many sports focus on physical fitness, confrontation and entertainment, such as pearl ball of fireworks, shuttlecock and rattan ball, which are suitable for teenagers. They are lack of integration and development, and have not been well developed in school sports.

3 The Present Situation and Problems of National Sports in Colleges and Universities

Data mining (DM), also known as knowledge discovery in database (KDD), is a hot topic in the field of artificial intelligence and database. Data mining is a non trivial process to reveal hidden, previously unknown and potentially valuable information from a large number of data in database. A set of heuristics and calculations for creating data mining models based on data. To create a model, the algorithm first analyzes the data provided and looks for specific types of patterns and trends [3].

In order to effectively evaluate data mining algorithm, we need to understand the overall situation and characteristics of data mining technology and algorithm. The process of data mining is shown in Fig. 1.

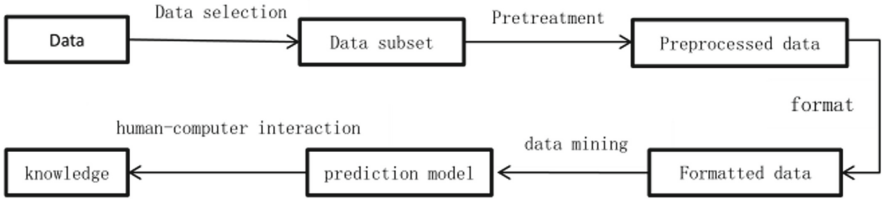

Fig. 1. Data mining process

4 Research on the Application of Data Mining in the Teaching of National Physical Education in Colleges and Universities

The application of data mining in national sports teaching and training is mainly manifested in the selection of sports teaching materials, the selection of sports teaching methods, the mining of students' characteristics and the prediction of students' physical condition.

4.1 Selection of Physical Education Teaching Materials

With the rapid development of science and technology, the trend of physical education teaching materials from paper to electronic is obvious. More and more physical education textbooks begin to show in the form of structured, dynamic and visualized graphics, images and videos in front of physical education learners, which not only enables learners to acquire knowledge in an easy and fast environment, but also makes it possible to mine useful information by using data mining technology due to the characteristics of easy storage, convenient transmission and processing of multimedia textbooks [4]; Through data mining technology, the reasonable classification, retrieval and processing of physical education teaching materials, and the establishment of knowledge system structure, provide reference for the selection of physical education teaching materials.

4.2 The Choice of Teaching Methods

Teachers can use a variety of teaching methods to complete teaching tasks, such as teaching, discussion, experiment, computer-aided teaching, visiting, investigation and practice. In general, it can be done in one or more ways. When choosing teaching methods, we can use data mining technology, use association analysis and other methods to analyze the evaluation of the course and the results obtained by students of different teaching methods, so as to find the internal relationship between the curriculum and teaching methods, and determine the teaching method to be used in a certain section of the course or course; The data mining technology of clustering and classification is used to analyze the grouping method of physical education, and to achieve reasonable teaching grouping according to the similarity of students' physical quality, and adapt to the teaching requirements of teaching according to their aptitude.

4.3 Mining Students' Characteristics

In the teaching of national physical education in Colleges and universities, Cluster analysis can be used to help teachers analyze students' initial knowledge system, current knowledge system and target knowledge system, and deeply submit students' physiological, psychological and social characteristics. The correlation is shown in Fig. 2, so as to better help students to correct their personal learning behavior, improve their learning ability, improve their personal personality, and promote the comprehensive and coordinated development of all aspects of students' quality.

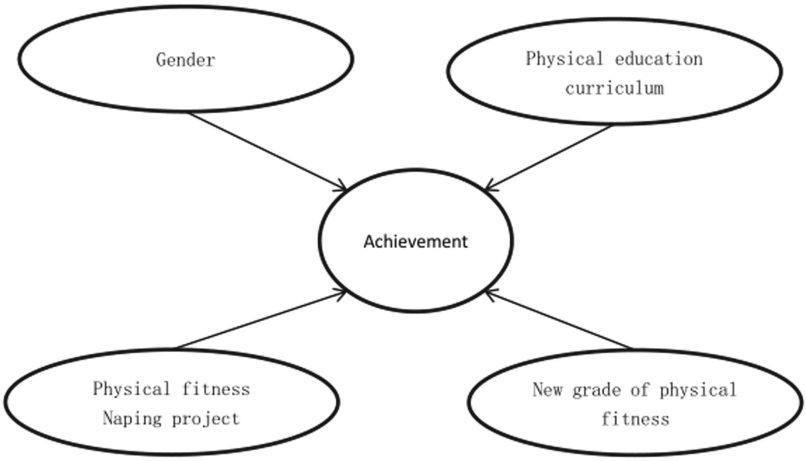

Fig. 2. Correlation network

5 The Application of Data Mining in the Evaluation of National Sports Teaching

The application of data mining technology in physical education evaluation mainly includes learning evaluation, curriculum assessment and teaching management evaluation.

5.1 Student Learning Evaluation

The evaluation of students' learning is one of the main teaching tasks of physical education teachers. To evaluate students' learning behavior scientifically and reasonably, we should not only focus on the evaluation of students' performance, but also use data mining tools to analyze and process the information of students' daily learning behavior, such as the records of rewards and punishments, so as to get an objective and fair evaluation of students, In this way, it not only plays the role of information feedback and stimulating learning motivation for students, but also is a way to examine individual differences of students, which is convenient for teaching students in accordance with their aptitude.

5.2 Course Evaluation

Under the current examination oriented education system in China, examination is not only a measure of students' learning workload and learning ability, but also an internal driving force to know students' learning and cultivate lifelong sports concept. Therefore, on the basis of collecting and sorting out students' theoretical knowledge, sports skills and sports literacy, data mining technology is used to discover and extract the knowledge and rules hidden behind the data, and to predict and timely adjust the difficulty of the examination content, the fairness of the examination methods and the rationality of the examination standards, In order to better reflect the important role of physical education examination in testing teaching effect and improving teaching quality.

5.3 Teaching Management Evaluation

Using the DEA system analysis method of data mining technology, we can evaluate the decision-making unit of physical education teaching, evaluate the effectiveness of national physical education teaching management, the scientificity of decision-making unit management policy and the effectiveness of training management, so as to guide the teaching management units to take corresponding measures to improve the level of national physical education teaching and training management.

6 Conclusion

In short, the rise of data mining brings a good opportunity for the combination of sports statistics and sports information technology. Data mining technology will become another powerful tool to promote the development of sports statistics after mathematics

and computer science. However, compared with the application degree of data mining technology in other fields, the research of data mining in the field of physical education has made some achievements, but there is still a lot of work to do.

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