Application of Multisensor Technology in Training

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ABSTRACT
In high school sports training, through competitive sports, more diversified training of students' physical quality, promote the all-round development of students, enrich the content of high school sports teaching, enhance the interest of high school sports classroom, stimulate and cultivate students' sports potential. This paper introduces the significance of the implementation of sports option teaching, based on data mining algorithm, puts forward the problems existing in the current high school sports teaching, and analyzes the high school sports teaching strategies.
Keywords: *Data mining; Physical training; operational research*

1 INTRODUCTION

Physical education is an indispensable subject in the current education system. As an important course to improve students' physical quality, physical education in Colleges and universities can not only strengthen their physical fitness, but also cultivate team cooperation awareness and rule sense, It is of great significance to improve the students' body coordination quality and personality. At present, there are some problems in the physical training course of colleges and universities, such as single teaching method and backward idea, so we have to innovate the sports training mode[1]. However, the innovation of physical training in Colleges and universities is not achieved in one stroke. It is necessary to innovate the idea, process, means and skills of physical training comprehensively, focusing on the development of students' personality, and paying attention to the efficiency, quality and integrity of physical training[2].
Diversified training contents can enable students to make independent choices according to their own strengths, further enhance students' interest in participation, improve students' subject status, and promote the cultivation of students' comprehensive quality[3]. Different from the traditional teaching methods, the extended training teaching mode covers not only basic physical exercise activities, but also training projects such as "crossing the fire line" and "graduation wall", which is more interesting for sports activities and enhance students' awareness of participation. Integrating expansion training projects into high school physical education teaching activities can provide high school students with a platform for team cooperation training, and gradually improve students' awareness of team cooperation in the training process[4].
In order to cultivate students to establish a positive and optimistic attitude to study and life, to promote the formation of students' lifelong sports concept and improve the effectiveness of high school physical education, training is an effective way for students to cultivate their comprehensive quality in high school physical education, which is of practical significance to promote the realization of comprehensive teaching objectives of high school physical education courses. The effective ways of physical training are shown in Figure 1 below.

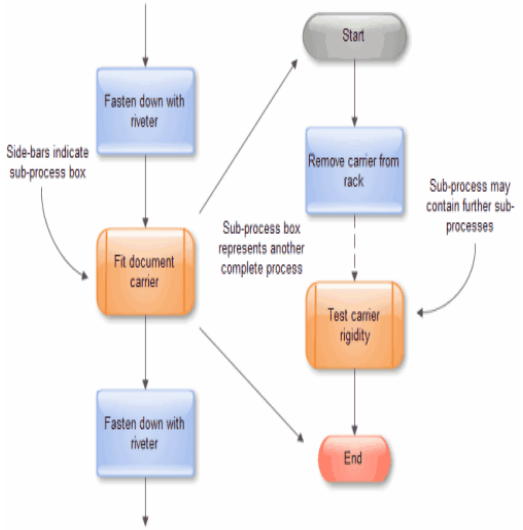

Fig. 1. Effective ways of physical training

2 RELATED WORK

2.1 Data mining overview

Makes inductive reasoning, and excavates potential patterns from it, and helps decision makers make correct decisions. Generally, it is considered that data mining is a link of knowledge discovery KDD in database, and it is the most important step to extract useful patterns automatically and efficiently by using specific data mining algorithm in KDD[5].

$$\begin{cases} E(t)\dot{x}_k(t) = f\big(t, x_k(t)\big) + B(t)u_k(t) + d_k(t) \\ y_k(t) = C(t)x_k(t) \end{cases} \quad (1)$$

$$\Delta x_{k+1}(t) = \int_0^t P^{-1}(\tau)\big(f\big(t, x_d(\tau)\big) - f\big(t, x_{k+1}(\tau)\big)\big)d\tau \quad (2)$$

However, in the industry, media and database research, data mining is more popular than knowledge discovery in database. Due to the wide use of DM, we do not make strict distinction between DM and KDD, but consider them equivalent concepts. In this sense, their definitions are one[6]. From 1989 to now, the definition of data mining is also improving. At present, the more generally accepted definition is given by Fayyad, etc.: KDD (DM) is an extraordinary.

$$f\big(t, x_d(t)\big) + B(t)u_d(t) - f\big(t, x_k(t)\big) - B(t)u_k(t) - d_k(t) = f\big(t, x_d(t)\big) - f\big(t, x_{k+1}(t)\big) + B(t)\Delta u_{k+1}(t) - d_{k+1}(t) \quad (3)$$

$$\lim_{k\to\infty} \|\Delta e_{k+1}(t)\| = 0 \quad (4)$$

Large scale data collection is the research object of data mining, which is described as "the source of knowledge" vividly. It c. Data mining technology is based on Application-oriented. It is to make micro or macro statistics, analysis, synthesis and reasoning for specific data to g all levels of business decision makers[7]. It is necessary to point out that the knowledge here is relative. It should be oriented to specific fields and practical application value under specific premise and constraints, and be easy to be understood by users, and even expressed and described in natural language.

2.2 Algorithm of data mining

Data mining is a multi-stage data processing process, as shown in Figure 2.At present, the main methods used in data mining tools include decision tree, relevant rules, neural network, genetic algorithm, visualization, OLAP online analysis and processing. These data mining algorithms can be divided into association rule mining algorithm and classification algorithm according to their functions.

Association rule mining finds interesting association or correlation between itemsets in a large number of data. Apriori algorithm is one of the most influential algorithms to mine frequent item sets of Boolean association rules, and FP Tree algorithm is also used.

Classification is to select the training set that has been classified from the data to establish the classification model. The classification algorithm includes:

(1) Decision tree classification

The purpose of learning is to minimize e, but due to the particularity of the model lake system, even if all y = ti will not be zero. Therefore, different stop iteration rules are required according to different requirements. The modular rules for multiple input multiple output (MMO) can be decomposed into thousands of multiple input single output (MSO) fuzzy rules. The integration of multiple BP networks is shown in Figure 2. The signal processing neural network processes the signal detected by a single sensor with stem, extracts useful information as the input of the fusion neural network, and the fusion neural network performs fusion processing on the obtained information at a certain level to obtain more comprehensive and accurate information. That is to say, building sub networks to identify various objects and combining individual networks in a parallel integration way can obtain a high-performance identification system.

$$I(s_1, s_2, \ldots, s_n) = \sum_{i=1}^{m} p_i \log_2(p_i) \quad (5)$$

(2)Bayesian classification

(tree augmented Bayes network) algorithm. The biggest advantage of Bayesian classification is easy to understand, good prediction effect, also combined with the advantages of other algorithms. For example, Tan algorithm has the advantages of both decision tree and neural network. As shown in Figure 3, Each unit BP network can account for image preprocessing, dimensionality reduction and other feature extraction. For each component of the target vector X of each sensor, it can learn the data of each trained set of BP neural network, apply the test sets a and B to test, take the results as the input of the integrated network, and use the boosting method to generate the integrated network individual mobile robot multi-senso.

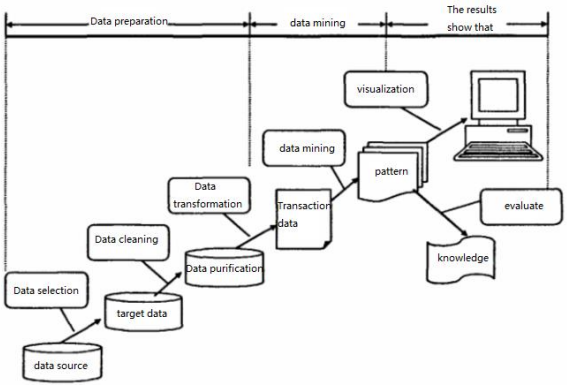

Fig. 2. The basic process of data mining

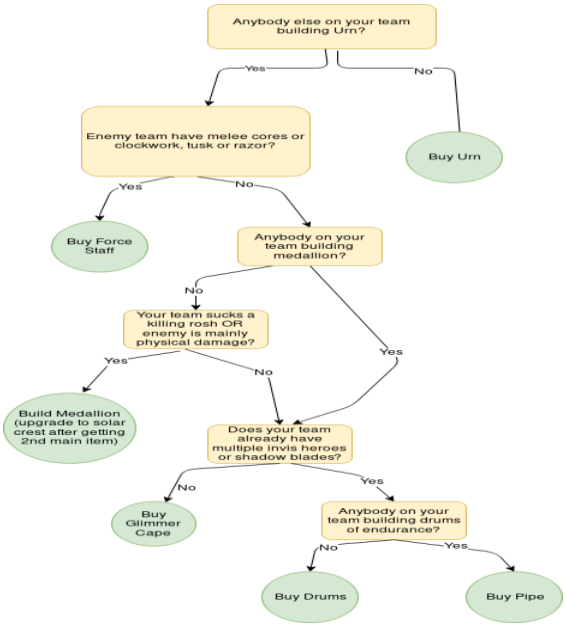

Fig. 3. Bayesian classification is a statistical classification method

(3) Network classification algorithm

Neural network was first proposed by psychologists and neuroscientists, aiming at developing and testing computational simulation of neural network. The disadvantage of neural network is that it is determined by experience and its interpretability is poor; Its advantages include high tolerance to noise data and its ability to classify untrained data. And this advantage is very suitable for data mining classification, so there are some trained neural network rules extraction algorithm. The most popular neural network algorithm is the back propagation algorithm proposed in the 1980s [8].

3 DATA ANALYSIS

The innovation of physical training in Colleges and universities should start from the concept, technology, methods and system to comprehensively innovate the physical education in Colleges and universities. In a word, the significance of sports training innovation in Colleges and universities is mainly reflected in the following five aspects:

（1） We should change the current situation of physical training in Colleges and universities, and solve the problems of backward concept of physical training, single teaching method, unclear goal, unreasonable method and low efficiency. At present, many college physical training courses in our country are in a backward sub-health state for a long time, and the effect in cultivating students' physical quality and ability is not good, which restricts the development of college physical training. To promote the innovation of sports training in Colleges and universities can adjust the sub-health state of sports training courses, reform the concept, method, technology and system of sports training, so as to promote the sustainable development of sports training in Colleges and universities[9].

（2） Grasp the future blueprint of college sports training, promote the standardization and scientific development of college sports training. The innovation of physical training in Colleges and universities involves the innovation of concept, technology, behavior and system. Its difficulty is closely related to the scope, content and level of innovation. Therefore, as the person in charge of sports training innovation in Colleges and universities, we should grasp the future blueprint of sports training innovation in Colleges and universities, find out the problems, find out the internal laws, and finally solve the problems in a planned way, so as to promote the standardization and scientific development of sports training in Colleges and universities.

（3） Highlight the training purpose of people-oriented and take the road of sustainable development. The innovation of physical training in Colleges and universities must aim at improving students' physical ability and sports consciousness, and strengthen the competitive advantage of physical training in Colleges and universities. In other words, the innovation of physical training in Colleges and universities can effectively promote the sustainable development of physical training innovation in Colleges and universities by innovating training objectives, scientifically adjusting training contents, integrating training methods, optimizing training process and training system, and fully integrating the people-oriented idea into the innovation process. As shown in Figure 4, the process of innovation training objectives.

（4） Strengthen the competitive advantage of college sports and promote the further development of college sports science. Sports training innovation is a breakthrough of efficient reform and performance, which can promote the scientific and reasonable circulation of human and financial resources in Colleges and universities, help colleges and universities to see the advantages and disadvantages of sports development in the new environment, grasp the opportunity, avoid risks, and scientifically choose development strategies, so as to promote the progressive and in-depth development of college sports[10].

（5） Improve the environmental adaptability of college sports, strengthen the integration of college sports and the new situation. College sports training innovation is carried out under certain subjective and objective factors, which are both opportunities and challenges. To strengthen the innovation of sports training requires colleges and universities to be good at judging the situation, make full use of the external potential favorable conditions, pay close attention to the external adverse environmental factors, and make adaptive adjustment to the innovation of sports training, so that sports training can constantly adapt to environmental changes, and promote the integration of college sports and the new situation [11].

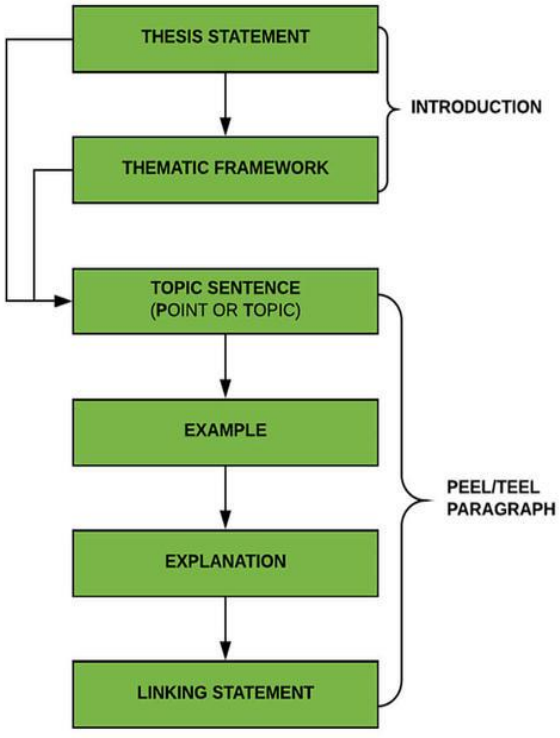

Fig. 4. Innovation training objective process

4 EXAMPLE ANALYSIS

4.1 Teachers should change the concept of training

In sports training, teachers should first have a sense of responsibility, change the single mode of traditional sports training, take a variety of training projects and make reasonable arrangements, so that students' sports potential can be tapped and cultivated.

Pay attention to preparatory activities in physical training

Paying attention to the preparatory activities and finishing activities in physical training is an important content to ensure the scientificity of physical training, prevent students from pulling in the process of physical training, and make students' physical function active and put into physical training faster.

Cultivate students' interest in physical training[12].

In physical education, teachers can combine teaching and playing to improve students' interest in physical training. Students can compete. The greatest charm of sports lies in its competitiveness. Students can well stimulate their fighting spirit and improve their training enthusiasm through competition.

Improve the venues needed for senior high school physical education option teaching

Many schools cannot change the shortage of venues and equipment caused by the shortage of educational funds in a short time. In this case, the teaching items should be fully combined with the current conditions of the school, and the items with low requirements for venues should be introduced. At the same time, physical education teachers should give full play to the role of the existing sports equipment in the school and develop the various functions of common equipment, Guide students to make simple equipment.

4.2 Pay attention to the preparatory activities in physical training

Paying attention to the preparatory activities and organizing activities in sports training is an important content to ensure the scientificity of sports training. It can prevent students from pulling in the process of sports training, and at the same time, it can make students' physical functions active and put into sports training faster. Due to the large consumption of athletes during sports, in addition to considering the amount of supplements, we should also pay attention to the appropriate matching of various nutrients. For example, supplementing different sugars after exercise has different effects on the maintenance of sugar storage in different parts of the body. Due to the different causes of fatigue in different sports, the specific nutritional methods are also different.

4.3 Cultivate students' interest in sports training

In physical education, teachers can combine teaching with playing to improve students' interest in physical training. The biggest charm of sports lies in its competitiveness. Students can stimulate their fighting spirit and improve their training enthusiasm through competition[13].

4.4 Improve the high school sports options required for teaching venues

Many schools can't change the situation of insufficient venues and equipment caused by the shortage of educational funds in a short time. In this case, we should fully combine the current conditions of schools in the setting of teaching projects, introduce projects with low requirements for venues, and at the same time, PE teachers should give full play to the role of existing sports equipment in schools, and develop the multiple functions of commonly used equipment, Guide students to make simple equipment[14].

5 CONCLUSION

It's very important to pay attention to high school physical education, which can not only improve students' interest in physical education, but also improve students' physical quality. Based on data mining technology, the proper use of sports option teaching can stimulate students' learning enthusiasm to the greatest extent, which is very beneficial to the improvement of teaching effect.
Paying attention to physical education is very important. It can not only improve students' interest in physical education, but also improve students' physical quality. If sports option teaching is used properly, it can stimulate students' learning enthusiasm to the greatest extent, which is very beneficial to the improvement of teaching effect.

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