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Badminton Guidance Teaching in the Background of Big Data

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Abstract: With the improvement of students' demand for badminton teaching, more and more training methods are added to badminton teaching methods. Badminton is one of the popular subjects in physical education courses in colleges and universities. Under the background of big data, through the application of big data technology, it can provide great convenience for teachers and students to teach and learn, and also promote the ability of cultivating students' autonomous learning. With the development of big data technology, sports reform based on big data technology will be put on the agenda. Under the background of big data, how to make use of this advantage efficiently, use scientific and reasonable strategies to stimulate students' subjective initiative of autonomous learning badminton technology, and actively explore in the process of learning. At the same time, improve teachers' teaching ability and teaching technology, so as to enhance students' badminton skills and give full play to the value of big data technology. How to change the original teaching mode, integrate the information provided by big data technology into the actual curriculum design, and improve the scientific nature of curriculum teaching. The formation of educational model in big data era is the inevitable trend of social development. The rational application of big data teaching mode has promoted the reform and development of traditional education, perfected the deficiency of traditional education, and made the development of physical education curriculum education more efficient, perfect and systematic. This is an important content to be discussed in this paper.

1. Introduction

As the big data era comes, people apply more and more data information, and develop and

innovate in the process of data application. If knowledge understanding is the process of value acceptance, then knowledge creation is not to solve the problem of knowledge production, but to improve teachers' knowledge literacy. By using big data technology, the students' movement capture, technical difficulties, training mode and training capacity are collected, and the understanding degree of each student is accurately analyzed [1]. According to the different foundation of each student, the technical of badminton is improved [2].

From the previous badminton education, there are generally two forms of development, one is a non-professional badminton students sports elective courses, the other is a professional badminton training courses, the distinction between the two subjects leads to differences in the subsequent education process [3]. On the whole, teachers focus on cultivating students' practical ability of badminton, but ignore the establishment of corresponding badminton education system. Some teachers think that the education of theoretical knowledge in badminton education is useless, which to some extent affects the development of badminton education, and there are obvious non-scientific problems in actual education process [4].

Badminton professional education lacks attention in China. During the actual teaching process, most teachers use the traditional teaching mode to carry out unified badminton education, ignore the individualized needs derived by students under the background of the development of the times, and reduce students' interest in learning. For example, most students choose badminton because of their interest in badminton [5]. There are different problems with significant foundations. Against this background, if teachers evaluate students' badminton learning effect according to a single goal, it will eliminate the enthusiasm and limitation of students with poor foundation to a certain extent, and promote the popularization and of badminton education [6]. For badminton students, on the other hand, badminton as a part of the subject, China's development in the field of competitive badminton has been in a "demand-driven" development model for a long time, many teachers are eager to achieve certain results in the classroom[7]. Excessive pursuit, ignoring the low level of students, also affect the overall scientific of badminton education in universities [8]. Big data technology can effectively teach students according to their aptitude and improve the scientific and rigorous in badminton teaching [9]. At present, with the arrival of big data era and the application of Internet technology, colleges and universities have entered the big data era, and the reform of physical education curriculum will be unstoppable [10].

2. Method

2.1. Svm Algorithm

Support vector machine is a supervised machine learning algorithm that projects vectors into higher-level spaces in which maximum spacing and planes are established with two parallel hyperplanes on both sides of the hyperplane of the data. Divided into two planes to maximize the dog's parallelism and the interval between planes.

$X_i\ Y_i\ X_i\ Y_i$ Test set D, with n training samples $D=\{(X_i.Y_i) \mid X_i \in R, Y_i \in \{-1,1)\}$ where, Y_i are class symbols, You can also take 1 and other constants of one -1 that are opposite numbers. wx-b=O, is the hyperplane Among them, x is a point in the hyperplane, W is a vector perpendicular to the hyperplane, b is a displacement vector.

If the training data are linearly separable, we can find two hyperplanes, without any sample points between them and with the largest distance between them. The hyperplanes are:

$$WX-b=1 \quad (1)$$

$$WX-b=1 \quad (2)$$

We want to make sure that the sample points are outside the hyperplane interval, that is ,Y_i $(Wx_i-b)\geqslant 1, 1\leqslant i\leqslant n$.

The distance between the two hyperplanes is 2/ | ω | , so our goal is to minimize the w. under the constraints of the upper formula The Lagrange multiplicative function is introduced,

$$\arg\min_{w,b}\max_{a\geq 0}\{\frac{1}{2}\|w\|^2-\sum_{i=1}^{n}a_i[y_i(wx_i-b)-2]\} \quad (3)$$

So $y_i(wx_i-b)\geq 1$, as a_i long as, need to be 0, $y_i(wx_i-b)=1$ only when, a_i not 0. So the final classification plane depends entirely on the points where the function distance is 1, which are called support vectors. However, in practical application, in order to ensure that the error of data misdivision is reduced to the lowest, SVM introduce ξ_i relaxation variables to measure X_i the misdivision of data:

$$\xi_i=\max\ (1-y_i(wx_i-b),0) \quad (4)$$

Our optimization problem is:

$$\min\|w\|^2+c\sum_{i=1}^{n}\xi_i, s.t.y_i(wx_i-b)\geq 1-\xi_i \text{ Among them i=1,... n} \quad (5)$$

Therefore, the second programming technology can be used to solve the problem.

2.2. Cox Model

Cox regression model is called Cox proportional risk regression model. There are n users (i=1. n), the i user's survival time is i_t . At the same time, the user has a set of adjoint variables $x_{i1}x_{i2}\Lambda\Lambda\ x_{ip}$. The model is:

$$\frac{h(t,X)}{h_0(t)}=\exp(\beta_1X_1+\beta_2X_2+\Lambda\ +\beta_pX_p) \quad (6)$$

h (t, X) is the risk function related to covariant X at time; $h_0(t)$ the B is regression coefficient; the benchmark risk function is any function related to time. Obviously, this is a semi-parametric model.

The British biostatistician D.R.Cox establish partial likelihood function by conditional death probability in 1972 Lp make the logarithmic likelihood $\log L_p$ maximum, and obtain the estimated value of the parameter $\beta_1,\beta_2,\Lambda\ \Lambda\ \beta_p$ by iteration of maximum likelihood method $b_1,b_2,\Lambda\ \Lambda\ b_p$. The formula is as follows L_p :

$$L_p=\prod_{l=1}^{n}(\frac{\exp(\beta_1X_{i1}+\beta_2X_{i2}+\Lambda\ +\beta_pX_{ip})}{\sum\exp(\beta_1X_{j1}+\beta_2X_{j2}+\Lambda\ +\beta_pX_{jp})})^{\delta_i} \quad (7)$$

Therefore, $\ln L_p$ the partial derivative is solved β .

2.3. Model Optimization

Because of the problem of data monitoring, insufficient data or incomplete data bring great problems to the analysis, and simple processing or insertion methods are used. Although there is no impact on the results, this part can be more reasonable or perfect data detection, considering the method of repeatedly collecting and verifying data, making the data accurate and complete.

3. Experiment

SVM model prediction

Table 1. SVM projections

Forecast	1-4 weeks	2-5 weeks	3-6 weeks	4-7 weeks
Correct rate	96.2%	97.4%	97.1%	95.7%
Accuracy	95.5%%	97.6%	99.4%	96.4%
Recall rate	96.8%	94.7%	94.8%	93.5%

In order to verify and evaluate the prediction effect, about 1/5 users were randomly selected as the test set and cycled to other training sets for 100 times to obtain the prediction effect of SVM new users. Our aim is to improve the technical level of students to test whether or not. Through the prediction effect of big data, different training objectives can be put forward to students, which can effectively improve the quality of education.

The data selected in the experiment were collected from the students. Specifically, students' intentions can be divided into three categories. One is to use big data analysis technology to help improve their own technology. One is an indifferent attitude. Although the big data technology is not expected, but want to improve their badminton technology, the last type is disapproving attitude, the experiment is to collect and analyze and predict the data of all students.

Because there are different basic abilities and different sports abilities between students, it is difficult for teachers to take into account the different basic abilities and actual conditions of each student. At this time, the data obtained through big data analysis is helpful for teachers to educate and guide, can set up a platform on the network, can also have students interested in badminton, through data analysis for autonomous learning and training. It has changed various teaching methods, realized the change of students' role, developed students' autonomous learning ability and brought into play the students' thinking mode. Not only for physical education courses, but also for other subjects. In addition, in the process of students learning through the network platform, teachers interact in real time to strengthen students' guidance and control of the online learning process. Strengthen students' guidance and control of the online learning process. To evaluate their learning effect scientifically.

4. Results

The definition of cox model is the same as that of SVM algorithm. The difference is that you need to organize the data into a format that can be analyzed.

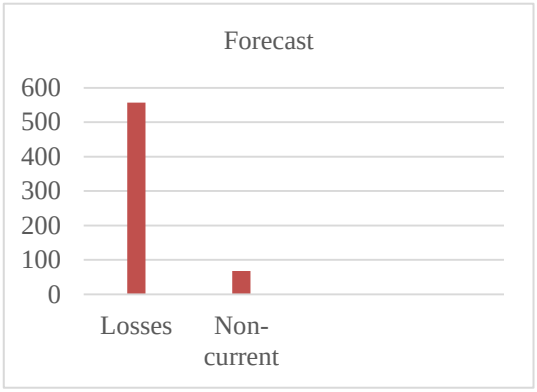

Figure 1. Forecast

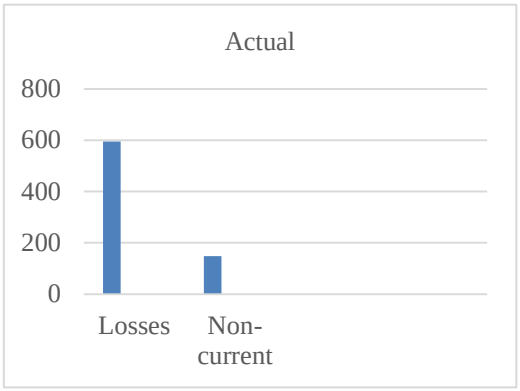

Figure 2. Cox results

With the model, the basic ability of each student is calculated separately, and then a threshold is given. If the value of the student's basic ability is lower than the threshold, it is considered to be lost, otherwise it is not lost. It can be seen from the diagram that the difference between the prediction and the actual comparison results is not significant, and the prediction results of the model are satisfactory.

To further verify the effect, about 1/5 users were randomly selected as test sets, others as training sets, cycling 100 times, and the prediction effect of COX model on new users was obtained. The accuracy of loss prediction is about 97.2. The recall rate is about 95.0, which is basically consistent with the prediction effect of svm model.

To that end, We propose the following definition. The definition consists of two parts α and β:β is a fixed value, α is the longest number of days for students to train according to the training mode analyzed by big data. Find out the maximum length of the student's continuous 1α,10 days If α=2; This α is related to each student's own training. Define a fixed value β, again If β=3; α+β is the threshold we think of students' basic ability. And then in 15 days, Look at the length of the last string of consecutive 1. Here, We chose 28 days (4 weeks) of data for analysis, α is that in 21 days (the first three weeks), The maximum length of a continuous time of 1. threshold β take 2.

In the analysis, the classification attempt is made on the student group, but there is no detailed classification analysis, and the model prediction effect of different population is compared. Through the distinction of people, the difference between different groups originates from the variable itself.

5. Conclusion

Basic technical action is the basis of students' badminton technical level. In order to improve students' badminton level effectively, teachers must strengthen the training of their basic technical movements. In practical teaching activities, teachers should induce students to practice with diversified training methods. This training method is generally carried out by industry people ." simple and complicated practice "is an effective training method to improve students' basic badminton skills. The above training methods are to carry out diversified and intensive exercises for specific technical actions, to familiarize students with this technical action, and to apply it to the overall comprehensive practice, to avoid separating specific technical actions from the whole sport in badminton technical training. Only training based on practical application has practical significance. In the process of badminton technical action teaching, blind and rigid training form is not desirable, students' learning ability is different, in the traditional teaching mode, learning content and learning progress are unified, each student is the same, but also, some students' learning ability is different. The foundation is weak and can not keep up with the teaching progress. On the other hand, the foundation of students is very good, teachers teach things we have learned, so we can allow different places, let students according to their own schedule and learning progress to make up for this difference. The arrival of big data era provides new opportunities for university information construction. Universities should seize this opportunity, make full use of the advantages of big data, constantly improve information construction, and improve university information construction on the Internet, using advanced technologies such as cloud computing and artificial intelligence, explore new and efficient education models, optimize learning systems, analyze the results of data analysis on the network platform through big data technology, and educate teachers effectively through these data.

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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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