

Retraction

Retracted: The Application of Motion Trajectory Acquisition and Intelligent Analysis Technology in Physical Education Teaching in Colleges and Universities

Security and Communication Networks

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Security and Communication Networks has retracted the article titled “The Application of Motion Trajectory Acquisition and Intelligent Analysis Technology in Physical Education Teaching in Colleges and Universities” [1] due to concerns that the peer review process has been compromised.

Following an investigation conducted by the Hindawi Research Integrity team [2], significant concerns were identified with the peer reviewers assigned to this article; the investigation has concluded that the peer review process was compromised. We therefore can no longer trust the peer review process, and the article is being retracted with the agreement of the Chief Editor.

The authors do not agree with the retraction.

References

- [1] Y. Wang, Y. Han, and Q. Wang, “The Application of Motion Trajectory Acquisition and Intelligent Analysis Technology in Physical Education Teaching in Colleges and Universities,” *Security and Communication Networks*, vol. 2022, Article ID 1917469, 13 pages, 2022.
- [2] L. Ferguson, “Advancing Research Integrity Collaboratively and with Vigour,” 2022, <https://www.hindawi.com/post/advancing-research-integrity-collaboratively-and-vigour/>.

Research Article

The Application of Motion Trajectory Acquisition and Intelligent Analysis Technology in Physical Education Teaching in Colleges and Universities

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Traditional classroom teaching analysis is mainly based on manual coding of time sampling, which has problems such as overreliance on experts, low analysis efficiency, and difficulty in large-scale services. Classroom teaching analysis based on artificial intelligence technology breaks through the predicament. With the continuous development of intelligent analysis technology, the research on physical education in colleges and universities becomes more and more meaningful. The task of physical education is to impart physical knowledge, technology, and skills to students, enhance their physical fitness, and cultivate their morality, will, and quality. It is one of the ways to implement sports goals. This article proposes how to change traditional teaching based on intelligent analysis technology. This article aims to study how to apply the emerging intelligent analysis technology to the physical education teaching process in colleges and universities; this enables students to be more personalized in the learning process, stimulates their enthusiasm for learning, and meets their basic requirements, breaking through traditional teaching methods, and making it possible to teach students in accordance with their aptitude. In the experimental analysis of this article, from the overall trend of the student evaluation data for 7 consecutive semesters, it can be found that the minimum value of the mean, median, and mode appears in the first semester of the 2016–2017 school year, and the maximum appears in the first semester of the 2019–2020 school year. The average score (mean) of students' evaluation of teaching fluctuates from 4.71 to 4.72, and the fluctuating range of the students' evaluation score (median) of the middlemost students is from 4.56 to 4.66. The results show that the intelligent analysis technology has played a stimulating effect on teachers' teaching and effectively mobilized teachers' teaching initiative. Therefore, the application of intelligent analysis technology is very necessary. Combine health education with moral education, intellectual education, physical education, aesthetic education, and labor education, and integrate it into the whole process of education, teaching, management and services, and build a health education system that is oriented to and responsible for everyone.

1. Introduction

Innovate traditional teaching methods and implement an efficient and practical new teaching model. With the further advancement of the new curriculum education reform, physical education teaching has become more efficient, and students' experience in class has become richer. In the current physical education, the construction of efficient classroom is one of the important teaching goals of teachers. In the new century, international competition has become increasingly fierce, our country's overall strength has

continued to improve, science and technology have advanced, and the pace of social life has accelerated. Faced with such social development, society has put forward higher requirements. The university is an important base to integrate with society, and it needs to undertake the important task of adapting to the rapid development of today's society, being physically and mentally healthy, and cultivating outstanding talents who can better adapt to the society. School physical education is an important part of school physical education. School physical education is closely integrated with moral education, knowledge education,

aesthetic education, and labor technical education. To ensure the normal progress of school physical education, a good physical environment must be a prerequisite.

Introduce fashion elements and integrate “fashion sports” into physical education. Many students do not like physical education classes, mostly because the teaching content and teaching forms of physical education classes are too boring to arouse students’ interest, let alone really attract students. According to the psychology of the students, appropriate changes can be made to the teaching content of physical education, and the teaching methods can be changed at the same time. With the rapid development of intelligent analysis technology today, the application of the Internet, big data, and smart bracelet information technology in the field of sports has improved the level of sports knowledge and played an important role in promoting sports performances. Today, because general artificial intelligence is not limited to specific aspects of intelligence, it is relatively high-end in the field of intelligence. Now, that goal is to research and produce systems that are almost human-like. The same is intelligence; in other words, its purpose is to achieve intelligence in a comprehensive way [1, 2]. The application and development of network technology in physical education in colleges and universities effectively integrates the current advanced teaching technology and abundant physical education resources, so as to realize the rapid development of modern physical education, and has an important reality for the popularization of lifelong sports and other awareness significance. The application of network technology in university sports is recognized by many experts and scholars in the field of education. At the same time, network technology will have a significant impact on the development of the modernization of teaching technology in colleges and universities in the future.

Zhou analyzed the relationship between quality development training and physics education in colleges and universities in China and put forward two specific ways to combine with the new era. At the same time, cloud computing can dynamically allocate computing resources according to the number of users and the complexity of applications. Zhou also analyzed the application of multimedia network teaching platform in college physical education based on cloud computing [3]. At the beginning and end of the course, Fitnessgram will assess their HRF level. The results showed that the aerobic ability, upper body muscle strength and endurance, abdominal muscle strength, and endurance of students were significantly enhanced, and the body fat rate decreased. In the whole experiment, no significant improvement in students’ flexibility was found. However, the flexibility of non-kinematics students is significantly enhanced, while kinematics students are on the contrary [4]. Y Ding T designed and proposed a college sports virtual reality system composed of Internet. The system collects relevant data from the Internet of things, interacts with the virtual reality scene in real time, renders the scene through the cloud, and experiences the virtual reality through the mobile terminal. Y Ding T aimed to propose an efficient, standard compatible and easy to analyze intelligent surveillance video coding framework [5].

Di P pointed out that physical education is an important part of the teaching system of colleges and universities, and it helps to cultivate comprehensive talents that meet the needs of society and enterprises currently widely adopted. Therefore, it is of great significance to study the application of multimedia teaching system in college physical education. This research first investigates and understands the research status of the subject. The application method of multimedia teaching system in college physical education is established, and the whole process is analyzed. Finally, experiments have verified that the new multimedia system is effective [6]. Lin Y believes that traditional planning path prediction methods have low accuracy and stability. In this article, we propose a new method of planning path prediction based on relative motion between positions (RMBP) by mining historical flight trajectories. Lin y proposed a new method for planning path prediction (RMBP) based on relative motion between positions to mine historical flight trajectories. Focusing on robot design, Lin Y designs high-precision binocular stereo vision synchronous acquisition system hardware and multi-threaded acquisition program to ensure the synchronization and data of left and right cameras [7]. The purpose of Fazzolari is to demonstrate the application of a set of intelligent data analysis technology in approximately 7 million online travel reviews, aiming to automatically extract useful information. The reviews collected from two popular online travel-related review platforms are all reviews posted by reviewers about a specific location in Italy between 2010 and 2017 [8]. Mueller proposed a method for rapid generation and feasibility verification of motion primitives for four-axis aircraft and similar multi rotor aircraft. The motion primitive is defined by any combination of the initial state of the four-axis aircraft, the required motion duration, and the position, velocity, and acceleration components of the four-axis aircraft at the end of the motion. A closed form solution of primitives is given, which minimizes the cost function related to input enthusiasm [9]. Ibaraki developed a prototype 3D optical motion capture system based on binocular stereo vision, back propagation (BP) neural network, and 3D compensation method for accurate real-time recording of mandibular motion. The special 3D compensation method can eliminate the unconscious vibration caused by human heartbeat and breathing. Aiming at the problems of high complexity and low 3D measurement accuracy in camera calibration process, a binocular vision 3D measurement method based on projection line and a calibration method based on BP neural network are proposed [10]. Through the research of scholars, we know that there are still many shortcomings in physical education in colleges and universities. It is necessary to improve the quality of teaching through movement trajectory-based capture and intelligent analysis technology. Therefore, how to improve teaching quality through intelligent analysis technology is an urgent problem that needs to be solved at present.

The innovations of this paper are as follows: (1) the application path of using intelligent analysis technology in the field of physical education: analyze the behavior trajectory of both players through big data, formulate

corresponding one-to-one strategies, and improve the quality of college physical education. (2) Based on the data mining method and neural network method of the movement trajectory, the experiment and analysis of college physical education are carried out, and actual cases and investigations are used to discover and solve the problems of college physical education in time. The sports score that used smart technology was 70 points, while the score that did not use smart technology analysis was only 16 points.

2. Data Mining Method and Neural Network Method Based on Motion Trajectory

2.1. Data Mining Method. This section introduces the detailed process of moving orbit extraction. The commonly used moving target detection and trajectory extraction methods mainly include block matching method, optical flow method, and particle filter method [11]. By looking for a set of random samples propagating in the state space to approximate the probability density function, and replacing the integral operation with the sample mean, the process of obtaining the minimum variance estimation of the system state, these samples are vividly called “particles,” so it is called particle filtering. Among them, the principle of the block matching method is very simple, but the number of displacements that can be matched is limited the smallest point.

Data mining is mainly for the purpose of data investigation and analysis. This is not a simple collection of a series of independent tools, but a carefully planned process to find useful knowledge from a large amount of data [12–14]. In order to improve the efficiency and quality of economic statistics work, we should actively change the traditional data processing methods, adopt more modern technical means and working modes, and use data mining technology flexibly. As a specific step of the database knowledge discovery process, data mining uses special algorithms to extract data patterns. The entire process of data mining is shown in Figure 1.

As can be seen from Figure 1, the data mining process mainly includes data collection, data preprocessing, model establishment, and overall analysis. From a macro perspective, the entire data mining process is divided into three parts: data preparation, data mining, and result interpretation and evaluation. Among them, data preparation is a necessary stage before data analysis, which directly affects the results of mining. This mainly includes data selection, cleaning, integration, conversion, and other steps [15].

- (1) Typical algorithm of decision tree.
 - (i) Decision tree algorithm describes or predicts data in the form of graphics or text according to rules [16]. The decision tree algorithm is shown in Figure 2.

ID3 algorithm: suppose B has b data samples, and B_i is the number of samples of class C_i . If there are m different values in the class label, define m different classes $1, 2, \dots, m$. Equation (1) gives the amount of information needed to classify a particular sample.

$$I(B_1, B_2, \dots, B_M) = - \sum_{i=1}^m P_i \log_2(P_i). \quad (1)$$

P_i is the probability that the sample belongs to C_i . Let the attribute T have v different values $\{a_1, a_2, \dots, a_v\}$. The attribute T can be used to divide B into v subsets $\{B_1, B_2, \dots, B_v\}$, where B_j contains some samples in B , and they have the same value on T , $2j(j, v) = 1, 2, \dots, v$. Let B_{ij} be the number of samples of class C_i in subset B_j . It can be expressed by the following formula:

$$E(T) = \sum_{j=1}^v \frac{D_j}{D} * \text{Info}(D_j), \quad (2)$$

$$D_j = B_{1j} + B_{2j} + \dots + B_{mj}. \quad (3)$$

Here D_j/D serves as the j -th division weight. For a given subset B_j , the amount of information is

$$I(B_{1j} + B_{2j} + \dots + B_{mj}) = \sum_{i=1}^m P_{ij} \log_2(P_{ij}). \quad (4)$$

Among them, $P_{ij} = B_{ij}/B_j$ is the probability that the sample in B_j belongs to class C_i . The information gain obtained by branching on the attribute T can be obtained by the following formula:

$$\text{Gain}(T) = I(B_1 + B_2 + \dots + B_M) - E(T). \quad (5)$$

C4.5 Algorithm: when the ID3 algorithm is split, it pays more attention to splitting multi-valued attributes. Such a division looks very fine, but it is actually meaningless. But the improved algorithm C4.5 of ID3 makes up for this shortcoming, because the C4.5 algorithm introduces the concept of gain rate [17] to split the attributes. The C4.5 algorithm uses a formula to calculate the split information, and the formula is

$$\text{SplitInfo}_T(D) = - \sum_{j=1}^v \frac{D_j}{D} * \left(\frac{D_j}{D} \right). \quad (6)$$

Then, the formula is used to calculate the gain rate of attribute A , and select the attribute with the largest gain rate for division. The calculation method is similar to ID3:

$$\text{GainRatio}(T) = \frac{\text{Gain}(T)}{\text{SplitInfo}(T)}. \quad (7)$$

- (2) Background image subtraction method.

Background image subtraction is currently the most commonly used method in segmentation of moving objects, using an extraction method based on the motion trajectory of multiple frames of images. Extract the space target motion trajectory with low signal and noise [18].

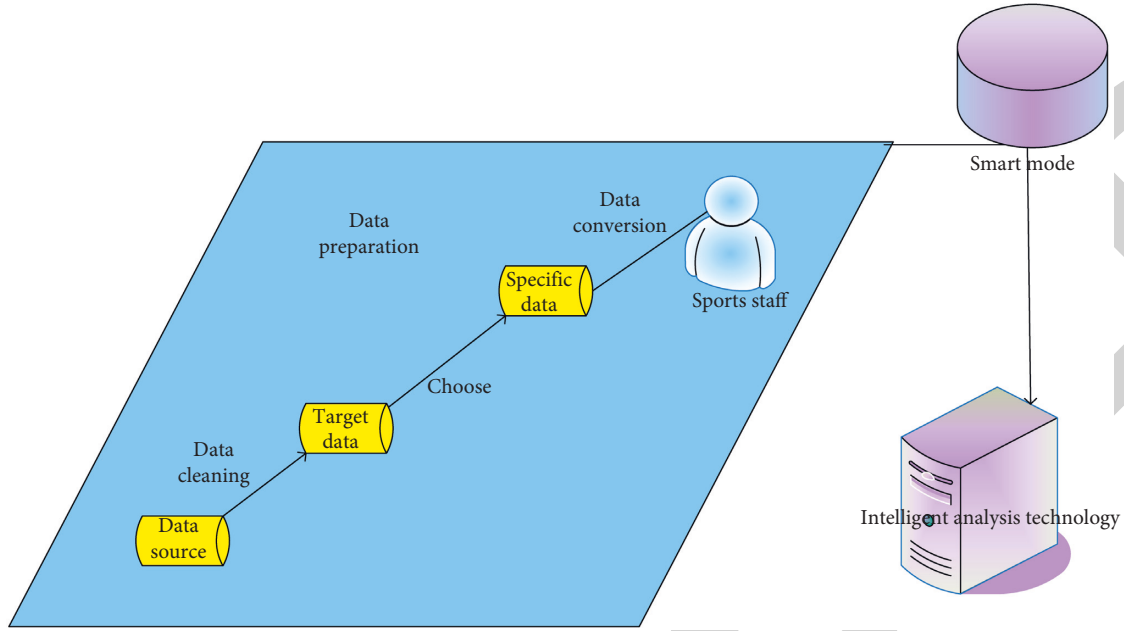


FIGURE 1: Process diagram of data mining.

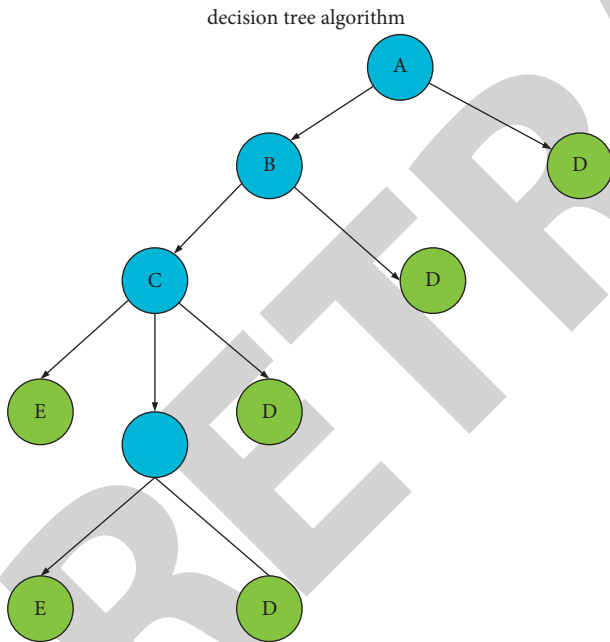


FIGURE 2: The decision tree algorithm.

In areas where there is no change, the strength of the difference is weak, and in areas where there are moving objects, the strength of the difference becomes stronger. Then, the threshold value of the difference intensity is obtained, and the binary difference image for determining whether there is an object to be moved is obtained. Before subtracting the background image, the background image must be generated [19]. In this section, the fast averaging method is used to generate the background image of each video segment, as shown in the following:

$$B(x, y) = \frac{1}{N} \left(\sum_{n=1}^N In(x, y) \right). \quad (8)$$

Among them, $B(x, y)$ is the background image, the coordinate is (x, y) , the gray value of N is the frame number B of the processed video paragraph, and $In(x, y)$ represents the gray value of the n th frame image coordinate (x, y) [20]. We have the following formula:

$$D_n(x, y) = \text{abs}(I_n(x, y) - B(x, y)). \quad (9)$$

The difference intensity image is only represented by $D_n(x, y)$. $In(x, y)$ represents the coordinates on the n th frame image.

2.2. Improved BP Neural Algorithm. In a general sense, the attention mechanism is an improvement on the encoder-decoder structure. The encoder-decoder model utilizes a neural network to transform an input encoded feature into another encoded feature. The attention mechanism component gives the neural network the ability to give “attention” to specific features when encoding data, and it helps solve the vanishing/exploding gradient problem that often occurs in neural networks. This paper monitors sports actions by analyzing sports tracks, studies the extraction and performance methods of sports tracks, and combines the contrast mechanism of neural networks to realize intelligent analysis technology based on sports tracks [21]. The key links of smart technology are shown in Figure 3:

Figure 3 shows the links of key intelligent technologies, which are indispensable. Therefore, to use intelligent analysis technology, it is necessary to have a general understanding of these key links and how to use them [22]. The

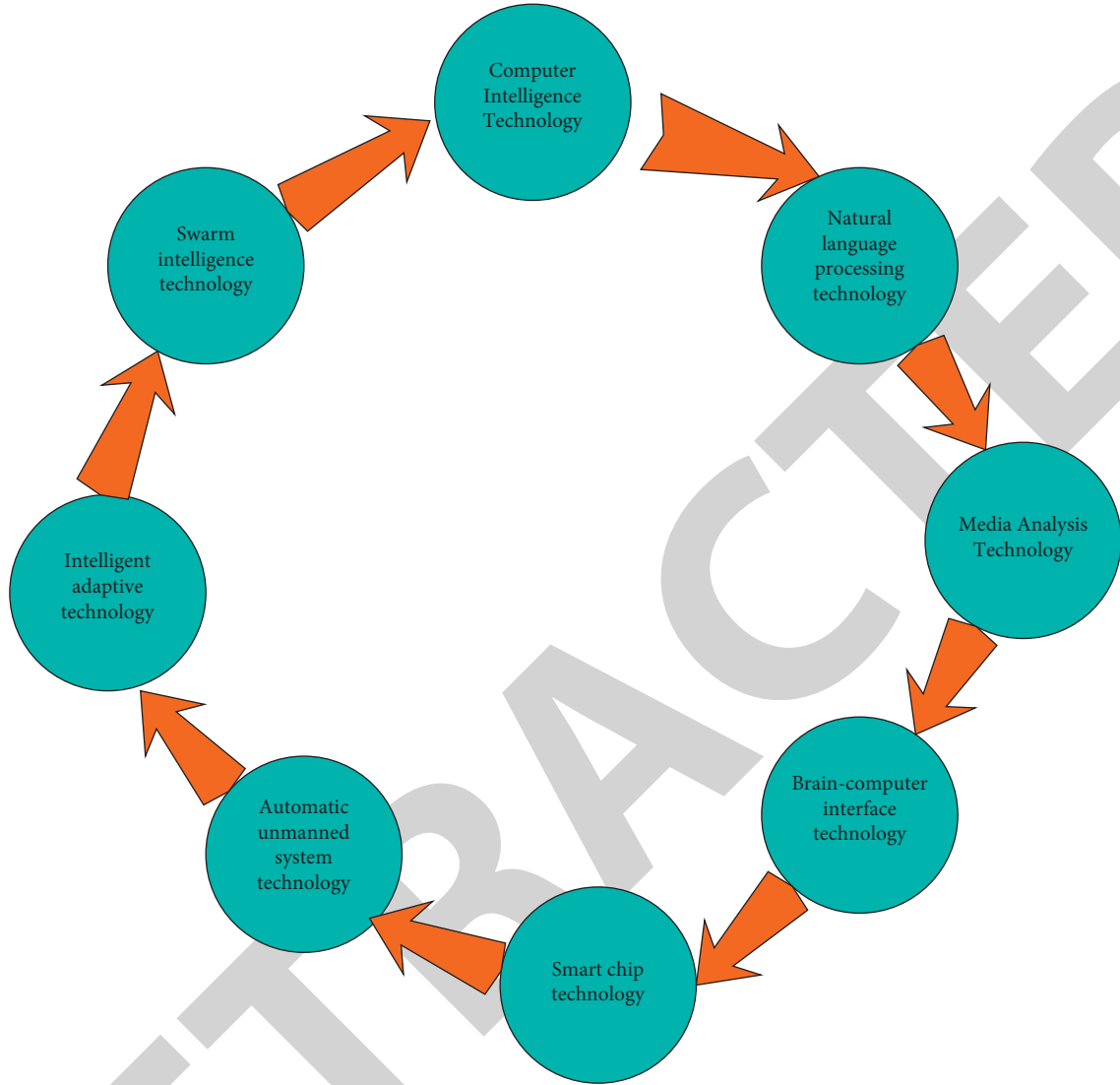


FIGURE 3: Flow chart of key links of smart technology.

intelligent analysis system is used together with the intelligent analysis software. In recent years, stimulated by the rapid growth of market demand, intelligent analysis products have emerged one after another, and intelligent analysis technology has been developed by leaps and bounds. It is more and more widely used in the industry.

BP neural algorithm does not need to show the equation describing this mapping relationship [23]. The structure of BP neural network model includes input layer, hidden layer, and output layer [24], as shown in Figure 4.

As shown in Figure 4, the standard BP algorithm often has the disadvantages of slow convergence and being easy to fall into local minimums. In order to make it suitable for the needs of this research, this paper proposes an improvement to the algorithm. In the optimization theory, BP algorithm is a very effective optimization design method [25]. Compared with the traditional BP algorithm, the improved BP algorithm has the advantages of faster convergence speed and higher correct detection rate. This paper chooses this

algorithm to optimize the single hidden layer BP network. Define the error index as follows:

$$\hat{F} = \frac{1}{2} \sum_{j=1}^n \left[\frac{1}{2} \sum_{t=1}^m (A_{ij} - a_{ij}) \right]^2 = \frac{1}{2} E^T E. \quad (10)$$

$\hat{E} = [\hat{e}_1, \hat{e}_2, \dots, \hat{e}_n]$ is an n -dimensional vector:

$$\hat{e}_k = \frac{1}{2} \sum_{t=1}^m (O_{ij} - o_{ij}) \quad (k = 1, 2, \dots, n). \quad (11)$$

The weight adjustment formula is

$$Q_{t+1} = Q_t - (J^T + \mu I)^{-1} J^T E^\wedge, \quad (12)$$

where $\hat{J} = \partial \hat{E} / \partial W$ is a matrix of $n \times p$ dimension, and the K th row in the matrix is

$$\frac{\partial \hat{e}_k}{\partial w} = \sum_{i=1}^m \frac{\partial \hat{e}_k}{\partial w} e_{ik}. \quad (13)$$

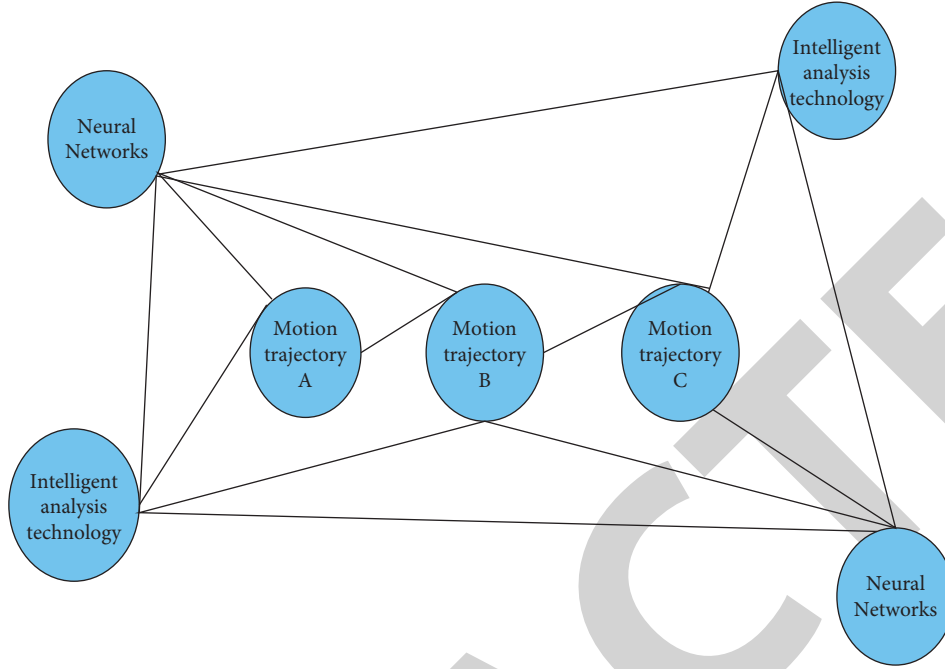


FIGURE 4: Topological structure of BP neural network model.

For formula (11), it is still necessary to calculate the inverse of a one-dimensional square matrix, and the formula is transformed. The inversion formula of the matrix is formula (14):

If $A^{-1} = B^{-1} + CD^{-1}C^T$, then

$$A^{-1} = B - BC(D + C^T BC)^{-1}B. \quad (14)$$

Let formula (15) can be obtained as follows:

$$(J^T J + \mu I)^{-1} = \frac{1}{\mu} I - \frac{1}{\mu^2} J^T \left(I + \frac{1}{\mu} J \right) J. \quad (15)$$

According to (15), the single hidden layer is composed of a one-bit array and contains several weights. The initial weight of each element in the array is zero. When the array is input into the vector, its weight is calculated, the difference between the sum value and the target value is taken as the error value, and the error value is sent to each corresponding array. This correction process is the training of the sample set. All input vectors follow this training process until the weight values in the single hidden layer converge [26].

2.3. Apriori Algorithm. The two basic problems of association rules are support and trust [27].

According to the Apriori property, in the process of generating frequent item groups from candidate item groups, non-empty subsets of frequent item groups must also be frequent. In other words, for each item of the generated candidate set C_k , if the specific non-empty subset of the candidate set is not in the frequent item set $L(k-1)$, there is no need to combine the candidate with the minimum value [28]. Compare the support threshold and delete it directly, as shown in Figure 5.

Combined with Figure 5, we convert the coordinates of the feature points of the motion trajectory into expressions. This represents the distance between adjacent feature points and the angle between two adjacent motion tracks. The track rotates counterclockwise in the positive direction and clockwise in the negative direction. Here, the basis for determining the curvature and direction of the track is the position data of the track moving from left to right in the video image coordinates. The method of expressing the orbit of the coordinate angle is not sensitive to the transformation of rotation and parallel movement but is sensitive to expansion and contraction. Because it is based on only three adjacent points, it can represent the local information of track segments of any length [29]. Suppose the target is at the position of time $t-1$, the position of time t , and the target position of time t .

It is defined as expression (16):

$$\theta = \frac{b_t - b_{t-1}}{\sqrt{(a_t - a_{t-1})^2 + (b_t - b_{t-1})^2}} \quad (16)$$

Figure 6 is an illustration of the definition of the corner θ .

In Figure 6, the clockwise direction of the coordinates is the degree direction. Rotation angle difference is the difference between two adjacent rotation angles. When rotating counterclockwise, the difference is positive, which is called left-handed. When rotating clockwise, the difference is negative, which is called right-handed. The specific definition of the angle difference $\Delta\theta$ is as follows:

$$d_{jt}(a) = \sqrt{\sum_{k=1}^n (a_{jt} - v_{jt}(t))^2}. \quad (17)$$

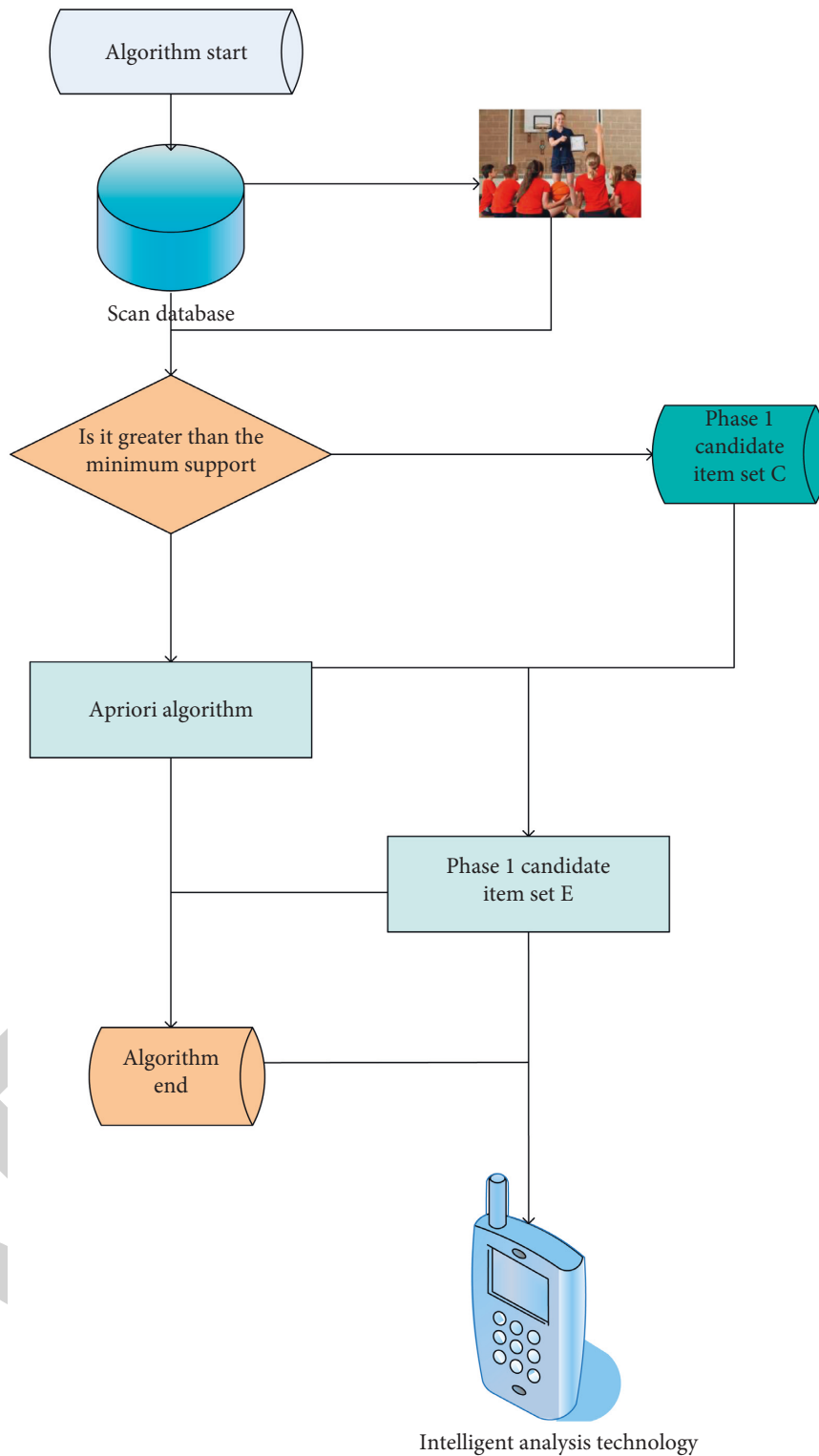


FIGURE 5: Association rule flowchart.

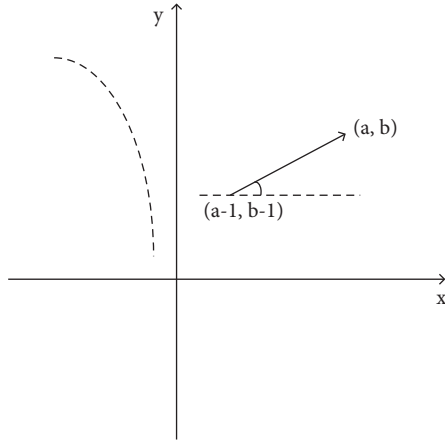


FIGURE 6: Definition diagram of corner θ .

Calculate the membership degree of each sample trajectory to all cluster centers:

$$R_{jt}(t) = \frac{1/d_{jt}^2(t)}{\sum_{m=1}^k (1/d_{jm}^2(t))}. \quad (18)$$

The central trend of the sequence set is a simple statistical feature of the sequence set. The following are several important central trends, such as

$$\bar{a} = \frac{1}{n} \sum_{i=1}^n n_i. \quad (19)$$

The degree to which the numerical data approaches the dispersion is called the dispersion or variance of the data. The variance of n observations is shown as follows:

$$s^2 = \frac{1}{n} \sum_{i=1}^n (a_i - \bar{a})^2 = \frac{1}{n-1} \left[\sum_{i=1}^n a_i^2 - \frac{1}{n} \left(\sum_{i=1}^n a_i \right)^2 \right]. \quad (20)$$

2.4. Intelligent Analysis Technology Method. This refers to the use of statistics, pattern recognition, machine learning, data abstraction, and other data analysis tools to find knowledge from the data analysis method [30]. The purpose of intelligent data analysis is to directly or indirectly improve work efficiency and play a role as an intelligent assistant in actual use. In this way, employees can get the right information at the right time and make the right decision in a limited time.

As shown in Figure 7, intelligent analysis technology has penetrated into our lives, and the application of intelligent analysis technology can be seen everywhere in life scenes, which shows its importance.

3. Experiment and Analysis

3.1. Experimental Analysis of Questionnaire Survey Examples. Involving school sports evaluation index system should have three system designs: physical education index system; sports school physical education practice index system; Internet school physical education digital index system.

Sports factor analysis is based on a series of theories and methods, such as system analysis, to comprehensively and systematically analyze the elements that constitute the sports environment. The sports evaluation index system is a multi-element, multi-level, and complex system. In order to scientifically grasp the laws of the sports environment, it is necessary to use the theories and methods of system analysis to conduct comprehensive analysis and research.

This paper has designed the following questionnaires: an expert questionnaire on the selection of indicators for the academic performance evaluation system of gymnastics students majoring in physical education, an expert questionnaire on the validity of the questionnaire, a teacher questionnaire on the determination of indicator weights, and a study on multiple intelligence gymnastics questionnaires of students, teachers, and experts used in performance evaluation in practice.

From the interview survey and literature research, the current gymnastics academic performance evaluation mainly has the problems of too special evaluation object, evaluation method, evaluation content, and evaluation process, and there are many deficiencies. The understanding of evaluation is not comprehensive enough, and scholars are constantly exploring various aspects of physical education evaluation. There are the following problems in the evaluation criteria of gymnastics skills: the classification basis is unclear; the identification process is vague; the identification standard is unbalanced; the update of the identification content is slow, etc.

The expert questionnaire on indicator selection selects 10 experts as the survey objects here, the definition of expert is the title of associate professor or above, and the Delphi method is used to initially select indicators at all levels. The Delphi method, also known as the expert forecast method, is a method of predicting and judging future market trends on the basis of comprehensive analysis of historical and realistic data based on the knowledge, experience, and analytical judgment of experts (Table 1)

It can be seen from Table 1 that University *E* is still very interested in the application of intelligent analysis technology in physical education, and the total number has reached 125; University *D* is not very interested in the application of intelligent analysis technology in physical education, but in general it is said that the importance of physical education in various universities is still not high enough, and it is necessary to strengthen publicity.

The next step is to investigate and analyze the results of the application of intelligent analysis technology in physical education in 5 universities in 2018 and 2019, as shown in Figure 8.

It can be seen from Figure 8 that in 2018 the five colleges and universities used intelligent analysis to achieve very good physical education results, with high scores, with an average of about 50 points. When physical education teaching was not used, the scores were lower, at 20. After the promotion of intelligent analysis, five colleges and universities again graded the teaching in 2019. It can be seen that the sports scores using intelligent technology are as high as 70 points, while the scores without intelligent technology

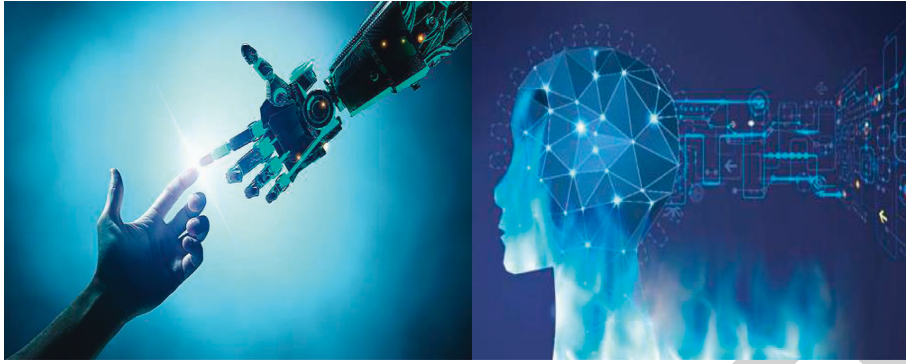


FIGURE 7: Intelligent analysis technology diagram.

TABLE 1: The number of titles in each university participating in the questionnaire.

Expert title	Professor	Associate professor	Lecturer	Teaching assistant	Total
University A	2	5	2	4	13
University B	3	4	0	0	7
University C	1	6	0	4	11
University D	2	3	1	3	9
University E	4	7	2	2	15
University F	5	5	3	1	14
University G	2	3	2	2	11
Total	19	33	10	16	80

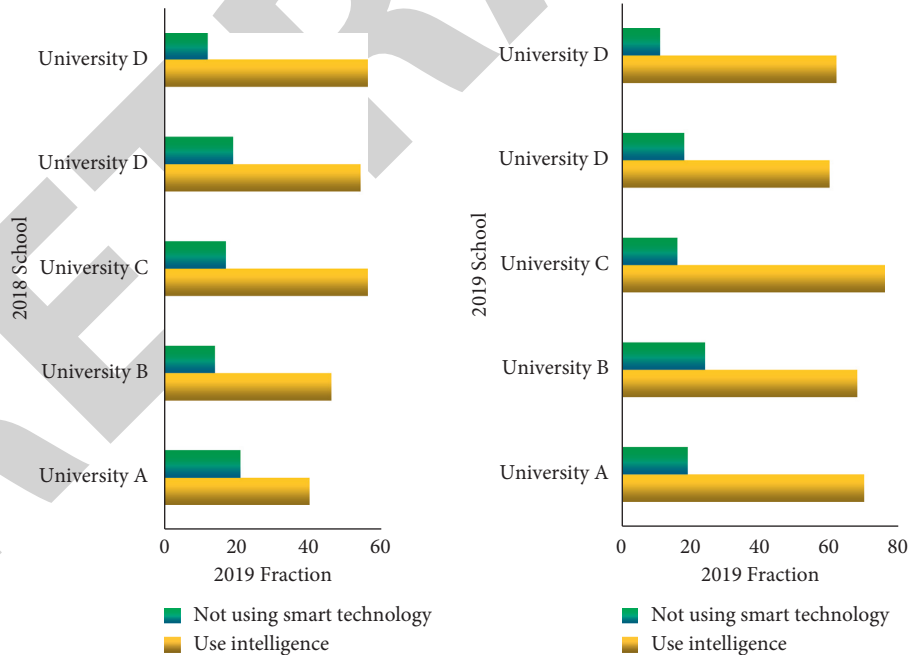


FIGURE 8: Comparison of the application of intelligent analysis technology in physical education in 2018 and 2019.

analysis have dropped to about 16 points. It can be seen that intelligent analysis technology plays a great role in college physical education.

From the overall change trend of the student evaluation data for 7 consecutive semesters, it can be found that the

minimum value of the mean, median, and mode appears in the first semester of the 2016–2017 school year, and the maximum value appears in the first semester of the 2019–2020 school year. Students evaluate teaching. The average score (mean value) fluctuates from 4.71 to 4.72, the

middlemost student's teaching score (median) fluctuates from 4.56 to 4.66, and the most frequent student's teaching score (mode) fluctuates from 4.58 to 4.68. The three central trend variables of mean, median, and mode are very close, and the closer the trend is, the more obvious the trend is. The standard deviation is only 0.1623 to 0.1637. The evaluation of intelligent analysis technology in physical education classroom teaching quality is very consistent; see Table 2.

It can be seen from Table 2 that the change in the average value of students' PE teaching scores shows that although there are slight fluctuations in the middle, the average value of students' PE teaching scores shows a clear upward trend, indicating that students are continuously satisfied with the quality of PE classroom teaching. The authors believe that the increase in the average teaching score is mainly because the intelligent analysis technology has played a stimulating effect on teachers' teaching, which effectively mobilizes teachers' teaching initiative, prompts teachers to increase their time and energy investment in teaching, and improves teachers' teaching and learning. Most teachers will continuously improve and adjust their teaching behaviors according to the students' evaluation of teaching in each semester, as shown in Figure 9.

As shown in Figure 9, the overall trend of the data on teaching evaluation by students for 11 consecutive semesters can be found. Physical education performance is improving year by year, especially in the second semester of the 2019–2020 school year, with scores as high as 5 points. So you know the importance of intelligent analysis technology for the application of physical education.

3.2. Experimental Analysis Based on Neural Network Algorithm. Through the evaluation system, the final result we want is to promote the development of students and improve the quality of teaching. The evaluation system is not only to get a result, but the most important thing is to see the essence through the result, so we need to provide timely feedback after the evaluation. Provide a basis for the next step of teaching and students' progress, lay the foundation, let teachers see the results and existing problems of teaching, correct deficiencies in time, adjust teaching arrangements, improve teaching methods, and further improve teaching.

According to the Ministry of Education, ordinary colleges and universities are divided into 8 categories: comprehensive, agriculture and forestry, science, and engineering, art, teacher training, finance and economics, politics and law, medical science, and sports. They are recorded on the list of ordinary universities in China. Various types of schools are selected as the investigated schools from the general institutions of higher learning. According to the particularity of colleges and universities, one such school is selected in each province; the actual situation of the surveyed school is shown in Table 2. A total of 108 colleges and universities are selected. Table 3 shows the statistics of the number of colleges and universities surveyed by various majors.

It can be seen from Table 3 that the agricultural and forestry science projects are very interested in the

application of intelligent analysis in physical education, and the number of participants has reached 35%. Other majors may not be very interested in physical education due to their busy schedules.

The school physical education major has not had a special intelligent analysis teaching student evaluation system. The final academic performance results are mostly presented in the form of scores. The form is single. The amount of information shown in the evaluation results is too small, and there is a lack of process evaluation and evaluation of learning. The result feedback is not timely; these will eventually affect the progress of the teaching reform, and even the curriculum development of gymnastics, so it is necessary to construct a set of objective, complete and practical academic performance evaluation systems, as shown in Table 4.

It can be seen from Table 4 that the first and second grades of the university are very interested in the application of intelligent analysis in physical education. The number of participants reached 45% and 37%, while the number of participants in other grades may be relatively small. The analysis did not pay too much attention.

As shown in Figure 10, the four teachers' affirmation of intelligent analysis technology has reached more than 45%. It can be seen that in the application of physical education we should add more intelligent analysis technology, pay attention to individual differences, and give full play to the individual. Teachers should encourage good students to drive poor students, teach in multiple channels and in many ways, strive to improve students' enthusiasm for learning, and promote students' all-round development. The theory of multiple intelligences has made gratifying achievements in many fields. If it is used in physical education, we believe it will also gain brand new results.

Since the introduction of intelligent analysis technology, it has been applied to various fields of education and has achieved great success at home and abroad. Numerous cases have proved its superiority and scientificity, so it has a solid theory to integrate its concept into teaching.

4. Discussion

The purpose of this article is to apply the intelligent analysis technology in the field of university sports and realize it. Specifically, import big data and intelligent analysis technology, analyze how it affects teachers and students, and then analyze whether it can be implemented effectively. Finally we came to a conclusion and expressed recommendations.

Through the summary and analysis of relevant data, the combination of artificial network algorithms based on basketball's own characteristics, and the dialectical and unified analysis and research, the advantages and disadvantages of big data applications can be obtained.

This article introduces the study of data mining technology and uses different algorithms in data mining to analyze data: the association rule Apriori algorithm is applied to the performance analysis of computer students, and the clustering K-means algorithm is applied to physics

TABLE 2: Evaluation form of physical education classroom teaching quality.

School year semester	16-17(1)	16-17(2)	17-18(1)	17-18(2)	18-19(1)	18-19(2)	19-20(1)
Teaching evaluation	3012	3042	3561	3213	3653	3765	3786
Mean	4.25	4.3	4.28	4.27	4.28	4.29	4.71
Median	4.32	4.56	4.45	4.63	4.37	4.52	4.72
Mode	4.4757	4.53	4.57	4.52	4.65	4.57	4.76
Standard deviation	0.1653	0.1652	0.1542	0.1672	0.1623	0.1643	0.1637

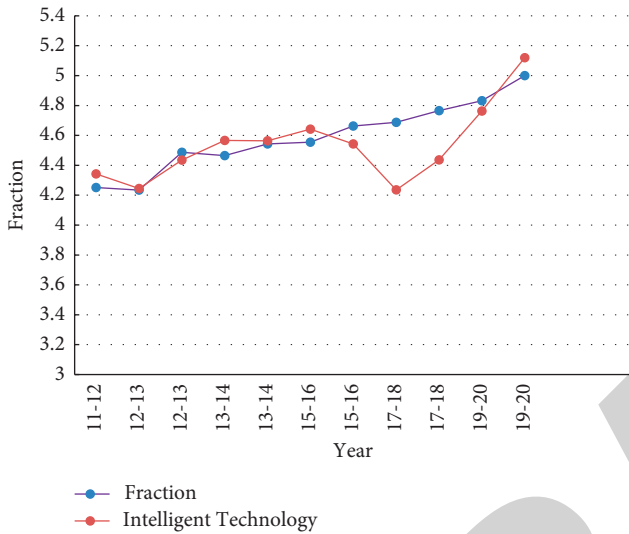


FIGURE 9: The change of the average value of students' PE teaching scores.

TABLE 3: Number of colleges and universities surveyed by various majors.

Serial number	School category	Quantity
1	Miscellaneous	23
2	Teachers	25
3	Agriculture and forestry	15
4	Science and engineering	12
5	Art	9
6	Medical	7
7	Finance	8
8	Politics and law	5
9	Sports	3
Total		108

professional optical experiment teachers. In the evaluation, the decision tree C4.5 algorithm is applied to the analysis of the factors affecting student performance in computer programming, so as to draw conclusions worth pondering.

This article also proposes a neural network algorithm based on the motion trajectory, to analyze the feasibility and role of intelligent analysis technology in physical education teaching in colleges and universities. To do a good job in sports propaganda work, we must consolidate the foundation, improve the system, pay close attention to key points, pay attention to service, and innovate development; we must further improve our understanding of the importance of sports propaganda work; we must further improve the

TABLE 4: Academic transcript.

Basic information	Project frequency	Frequency	Proportion (%)
Gender	Male	3200	53
Gender	Female	3012	47
Grade	First grade	2546	45
Grade	First grade	2654	37
Grade	Third grade	863	11
Grade	Fourth grade	287	4
Grade	Kenichi	156	3

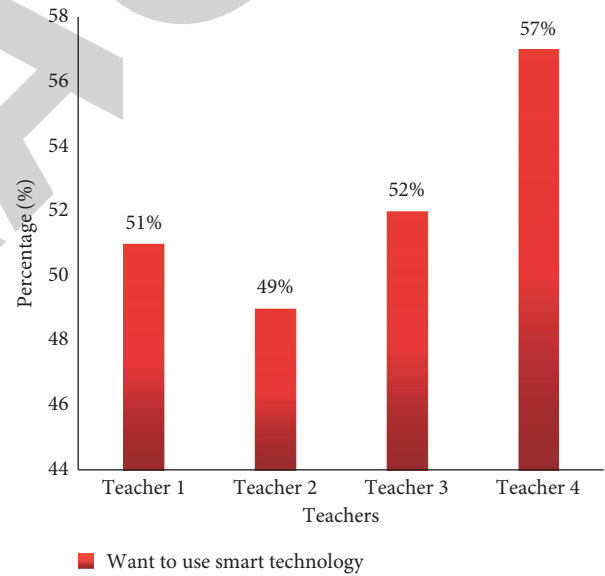


FIGURE 10: Teacher's demand for intelligent analysis technology.

service media, the overall situation of sports, and the economy, society, and culture, develop an overall understanding, with an innovative attitude, solid work, and fulfill the sacred duty of sports propaganda workers.

5. Conclusions

This article mainly starts from the motion trajectory and intelligent analysis technology and discusses the relationship between the two and how to apply intelligent analysis technology to college physical education. Based on neural network algorithms and data mining algorithms, we can know the following: only the application of intelligent analysis technology to college physical education can promote the rapid development of physical education

informatization. At present, how to use the advantages of network technology to apply to college sports, so as to improve the efficiency of sports teaching, increase sports teaching methods, and improve college sports management is an important direction for the development of college knowledge sports. Under the background of the current Internet age, it is necessary to be guided by modern new educational concepts and learning thinking in order to give full play to the role and functional advantages of the application of network technology to college physical education, so as to provide a more advantageous way for college physical education. The authors' academic theory and professional ability are poor, and it is inevitable that there are shortcomings. There are still certain problems in the design work. At the same time, the authors are constantly discovering and solving problems and are striving to be the best.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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