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Retraction

Retracted: Analysis of Practical Training Characteristics and Teaching System Reform Path of College Physical Education Curriculum Based on Deep Learning

Security and Communication Networks

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] P. Fang, "Analysis of Practical Training Characteristics and Teaching System Reform Path of College Physical Education Curriculum Based on Deep Learning," *Security and Communication Networks*, vol. 2022, Article ID 9614356, 13 pages, 2022.

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Research Article

Analysis of Practical Training Characteristics and Teaching System Reform Path of College Physical Education Curriculum Based on Deep Learning

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With the growth of the new international alignment, the establishment of multifunctional and applied universities and the training of high-quality talents have become the key tasks of all colleges and universities. With the encouragement of national policies, college physical education has gradually become one of the key subjects for students. As a novel way of pursuing learning goals, deep learning includes high-level and high-stage cognitive management strength or innovative thinking strength. With the background about the widely respected teaching about school sports education of deep learning mode, this article puts forward the analysis of practical training characteristics and educational system reform path of college physical education based on deep learning. The results of the experiment are as follows: (1) this article discusses principles and ideas of the immediate in-depth learning mode and the vacancies in the current college physical education curriculum practical teaching system, determines the research direction of the experiment, and analyzes the characteristics of school physical education practical training as well as the innovation path of the teaching system based on the in-depth learning mode, which provides a technical guarantee for the research of this article; (2) using deep learning algorithm, neural network decomposition method, and recurrent neural network algorithm, the investigation content is identified, analyzed, and calculated through experiments, which is not enough to effectively and accurately analyze the root cause of the problem; it also optimizes and improves according to specific problems, reducing unnecessary research work and time consumption.

1. Introduction

In today's industrialized production, due to limited production equipment and funds, the quality of the final product cannot be effectively calculated, that is, it cannot meet the requirements of the production plan. As a new testing scheme, economic data transmitter focuses on the retention test of the final value in the process of book store testing, which provides a stable and effective testing tool. Deep level learning plays an important role in today's network level learning and has been widely used in machine models. By using deep level learning, we can create an interactive transmitter and extend it to industrial manufacturing cases. The comparison of modeling results shows that compared with traditional methods, deep learning technology has the following advantages, especially suitable for soft sensor modeling [1]. The goal of statement division is to distinguish statements in the background of interference factors. Statement separation is an important task in information processing. It is found that this is a supervised learning problem based on speech separation. It uses the relationship between speech and speaker to estimate the background noise, and uses different discrimination patterns to classify the training data. In the past decade, a lot of research work based on the supervised separation algorithm has been proposed. Recently, as deep learning is widely used in any field about speech separation, some innovations have been proposed to improve the separation performance [2]. The neural network decomposition algorithm is used to obtain representative feature factors, extract and classify feature factors, and the deep learning network feature analysis and processing tool is introduced. This

engineering example verifies the superiority of the neural network decomposition algorithm [3]. The spiritual network method and the deep learning method have been successfully applied to computer vision. This article attempts to adapt CNN for optical camera to its microwave counterpart, namely, synthetic aperture radar. As a preliminary study, the convolution neural network algorithm can help to obtain the pixel features to be extracted from the target image. The idea of this algorithm is not to use the traditional dissemination algorithm, but to use the coding feature analysis with supervisory performance to train the image features. This algorithm can effectively reduce the computational complexity. First, a series of feature maps extracted from SAR images are obtained by convolution and merging, and then these feature maps are used to train the final classifier [4]. After training the system, experiments show that the algorithm is feasible. Compared with the traditional malicious code detection based on machine learning, DBN does not need any prior knowledge in the detection process. The results show that the target algorithm is efficient and accurate. Deep learning system is mainly composed of many ways, such as transmission or neural network. Finally, the optimal hybrid model is achieved by fine tuning the whole network. After inputting the test samples into the hybrid model, the experimental results show that the detection accuracy of the proposed hybrid detection method is higher than that of other levels; the design model reduces the use of time and improves the efficiency of development [5]. This article makes a comprehensive statistical analysis on the content, layout, and the development of teaching staff of national and provincial excellent physical education courses over the years. The research results show that the development of sports quality courses in China is good, but there are also problems. For example, the overall development level is low, discipline department management is serious, and the development of internal sub disciplines is uneven. Improving the introduction of teacher team resources to promote the increase of teaching effect, evaluation, supervision, and fund guarantee system are effective ways to solve the problems existing in the introduction of teacher resource team [6]. Implementation on the club system in and out of class integration mode in college physical education curriculum is to adopt more flexible and diverse ways to implement teaching project action. This model helps to maximize its functionality to students' enthusiasm and inspire enthusiasm for learning. The physical education system for college students can not only develop a structure suitable for college students' physical exercise but can also stimulate college students' initiative to exercise and good mentality and form the habit of exercise. It helps to promote the socialization of human development. It paves the way for the society in future. In addition, this mode can maintain the enthusiasm and extensibility of college physical education teaching, promote lifelong physical education, and promote the overall development of quality education, which is the inevitable trend of college physical education development [7].To form the best PE management system suitable for the actual situation of colleges and universities, the layered teaching mode of PE courses in colleges and universities has been repeatedly tested and studied. In the formation of the model, quality education is the guiding ideology. This model aims to improve students' physical fitness. The starting point of this model is to deal with different students in different ways. The teaching content, means, and purpose should be closely consistent. The "one size fits all" situation must be changed, which ignores the differences in students' physique and interests. Goals at all levels have relative stability and certain variability [8].To increase the administration quality of technical courses in sports management institutions, enriching and improving the teaching methods of technical courses in physical education institutions is necessary. Nonverbal explanation contrary to oral explanation is a common teaching method in technical courses in physical education institutions. It is a teaching method summarized and improved on the basis of various teaching methods and according to physiological principles. By observing the differences in human tissues in different groups, this design can be divided into spatial methods, sensory methods, and observation methods in principle. Their characteristics are mainly reflected in the universality and efficiency of practical teaching, as well as the high speed and ambiguity of data transmission [9]. In order to explore the system to adapt to the experimental teaching content of the high-efficiency physical education major in the twenty-first century, the present situation of laboratories in some physical education colleges and universities was studied by using the methods of questionnaire survey and expert interview. It was found that the laboratory management system was old, the laboratory instruments were old, the laboratory staff structure was unreasonable, the experimental courses and theoretical courses were equally important, and the number of comprehensively designed experiments was too small [10]. The study believes that the reform of student-centered teaching methods in China is a historical trend and a long-term process. In the past two decades, Chinese universities have advocated ability-based education and tried to learn from the modern teaching methods of famous Western business schools. However, the more important work is to lay the foundation for modern teaching methods. In the process of promoting the teaching reform of undergraduate human resource management, we should deal with these difficulties in an orderly manner, with professional orientation, curriculum system reform, and teacher training [11]. Based on the majors of civil construction and real estate management and educational curriculum design, this article analyzes the mode of practical teaching management from both internal and external aspects, and highlights the importance of combining theoretical teaching with practical ability. It mainly uses the practical teaching management mode proposed by the British reporter, investigates and collects the feedback data of the research design, and creates a practical teaching management mode that is suitable for students and can meet their needs. The experimental research summarizes the linear satisfaction index and dynamic evaluation index of students on the practical teaching management model, so as to rectify and optimize the practical teaching management system according to students' feedback information, so as to promote students' practical learning ability and improve

teaching efficiency [12]. With the development of science and technology, the information technology revolution has brought about information age. Data information improves efficiency by collecting and processing data and is widely used in many fields. In the context of data information, the traditional college teaching system reform practice analysis management system is facing new challenges and reforms. This article analyzes the teaching reform path of college teaching system reform practice analysis, which helps students' enthusiasm and stimulates learning enthusiasm [13]. In the era of deepening educational reform and promoting educational innovation, the innovation of practical teaching not only adheres to the current concept of educational reform, but also promotes the continuous improvement of the college geography management system. Taking geography teaching methods as a research goal and adopting comprehensive analysis of the geography school teaching mode, we strive to solve the problems of single teaching methods, backward construction of geography textbooks, unreasonable use of courseware, and practical courses. Therefore, we should establish a modern geography teaching concept that attaches importance to heuristic and inquiry teaching [14]. Through investigation and systematic analysis, aiming at the problems existing in the practical teaching of physical education courses in colleges and universities, this article constructs an appropriate management standard consisting of practical teaching management content standard, practical support standard, practical evaluation standard, and practical feedback standard. A set of school physical education practice teaching mode was designed, which combines theoretical knowledge with teaching practice, further improves the overall quality of teachers, creates good teaching conditions for on campus training, strengthens the construction of off-campus practice bases, strengthens the management of practical teaching in schools, and promotes students' practical achievements through face-to-face teaching [15].

2. Analysis of the Practical Training Characteristics of College Physical Education Curriculum Based on Deep Learning and the Reform Path of Teaching System

2.1. Relevant Technologies and Development of In-Depth Learning. Deep learning is supported by big data. Through automatic learning of a great quantity of sample information, we can gain the internal laws and abstract expressions of data. According to the learned internal laws and abstract expressions, we can perform corresponding tasks for different fields.

The principle of deep learning technology is closely related to the information processing mechanism of human brain visual stratification. The working mechanism of human brain is to aggregate and process the initial signal in each layer of the brain before object recognition. When people are stimulated by the outside world, they will have different degrees of psychological reactions: happy feelings, and also sad feelings; some people feel excited, some feel depressed, some feel happy, and some feel painful. When the eye is observing the image, the retina collects the image information, which then enters the ventral visual pathway through the electrical signal, which is in charge of object recognition. Deep level research can be divided into supervised learning and unsupervised research.

Figure 1 shows the basic structure of deep learning network, which generally includes an input layer, multiple hidden layers, and an output layer.

2.2. Characteristics of Sports Teaching in Colleges

2.2.1. School Sports Education Curriculum Organization. At present, the construction of the school sports education academic model is based on the campus network, which provides support for online teaching of physical education network and builds different online teaching modules of physical education.

As shown in Figure 2, data show that the sports organization department of the school is directly led by the school leaders, who cooperate with the Communist Youth League and the student union to organize various sports activities in the school. The sports association department carries out various activities under the direct leadership of the school leaders.

An independent module is established on the homepage of the campus network to display the physical education teaching content. This module includes two parts: course information and teacher information. The internal sports module of the campus network shows students all kinds of sports activities teaching courseware, sports competition video production, taking wonderful sports photos, various project judging rules, learning the warm-up methods and physical care before physical exercise, publishing sports competition information, calling on students to sign up actively, and publishing award winning information to show the sports strength of the school.

2.2.2. Current Needs of School Sports Education. For the optimization of sports education studies, the teaching process should be more efficient. Second, we should use advanced network technology to deeply excavate and integrate the existing sports resources and combine sports theory with other related disciplines in combination with new educational auxiliary technology, so as to enrich students' learning content and improve the teaching efficiency of online courses. Third, teaching methods must be innovative. Teachers can carry out online teaching in a variety of ways and students are allowed to conduct offline teaching mode, improving quality of teaching.

College physical education curriculum design needs careful consideration through learner analysis and content selection, refining the classroom theme according to principles, using appropriate software practice and development, and careful designing. After that, it can be used in the classroom or network to check whether the effect evaluation can be obtained, so that college physical education

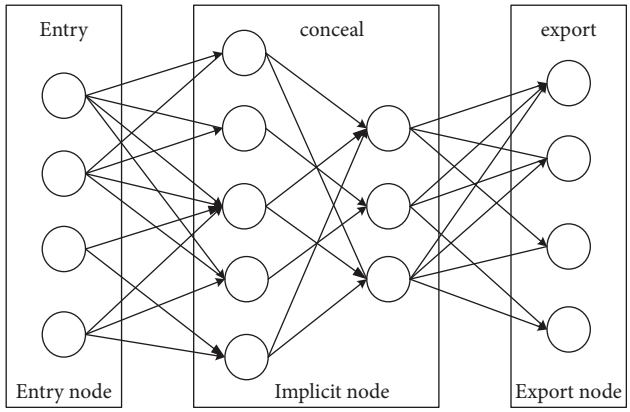

Figure 1: Basic structure of deep learning network.

curriculum can also be renovated on the basis of the existing evaluation.

As shown in Figure 3, the school physical education teaching system is designed with four aspects: sports education studies teaching objectives, sports education studies teaching themes, learning content analysis, and learner analysis. According to the learning situation, physical education curriculum learning strategies are formulated, so as to develop classroom resources and integrate them into learning activities. Finally, the teaching design is tested, evaluated, and applied to practice.

3. Algorithm Formula of Practical Training Characteristics of College Physical Education Curriculum Based on Deep Learning

3.1. Convolutional Neural Network Algorithm. Convolutional neural network is widely used in visual processing tasks and language processing tasks. Its main content is composed of sampling layer, initialization layer, lower sampling layer, connection layer, partition layer, and standardization layer.

When performing convolution operation in the convolution layer, it involves three common parameters: step size, filling value, and depth. Step length refers to the number of calculations required for convolution check of each pixel in the original image. It represents the distance between all data points obtained after convolution operation between the image filled by spacing pixels in a certain time and the original image. Depth refers to the time from the original image to the plane. It contains two different dimensions: one dimension represents the depth of the object and another dimension represents the distance between objects.

By improving the valid convolution algorithm, it is suitable for feature extraction in multiresolution image classification. The relationship between the feature dimension and step size obtained after the convolution layer, the filling value, the convolution kernel size, and the input feature size can be calculated by the following formula:

$$D_{\text{output}} = \frac{D_{\text{input}} - D_{\text{kernel}} + 2\text{Padding}}{S_{\text{kernel}}} + 1. \tag{1}$$

The same convolution is a convolution operation that does not change the size of the original image. The operation process of the same convolution is similar to the previous two convolution processes, with the difference in the selection of filling value. The mathematical expression is as follows:

$$n = \frac{n - D_{\text{kernel}} + 2\text{Padding}}{S_{\text{kernel}}} + 1. \tag{2}$$

A moving transformation of (2) is made, focusing on the relationship between the convolution kernel dimension and the filling value, and formula (3) is obtained:

$$\text{Padding} = \frac{1}{2}\left(\frac{n-1}{S_{\text{kernel}}} - n + D_{\text{kernel}}\right). \tag{3}$$

The activation layer refers to the network layer composed of activation function groups after convolution operation. The characteristic map obtained by convolution operation can bring nonlinear factors to neurons after being processed by activation function, so that the depth network can have similar characteristics with the research object. The initialization function mainly includes S-type growth curve function, hyperbolic tangent function, and linear rectification function, in which the mathematical expression of S-type growth curve function is as follows:

$$y = \frac{1}{1 + e^{-x}}. \tag{4}$$

The mathematical formula expression of hyperbolic tangent function is as follows:

$$\tanh(x) = \frac{e^{x} - e^{-x}}{e^{x} + e^{-x}}. \tag{5}$$

The mathematical formula of linear rectification function is as follows:

$$y = \begin{cases} x, & x > 0 \\ 0, & \text{otherwise.} \end{cases} \tag{6}$$

The function of the full-connection layer is usually to draw the previously learned features and convert them into the sample mark space. In the PCB image defect target detection task, it mainly includes the classification of the PCB defect categories and location. The output characteristics of the full-connection layer can be calculated using the following formula:

$$h(x) = \theta\left(\varpi^{T} x + b\right). \tag{7}$$

The parameter ϖ in formula (7) is a preset weight vector. The size of ϖ represents the importance of the corresponding target object in the multiobjective optimization problem. The larger ϖ means that the object is more important in the problem. On the contrary, the smaller ϖ-table modification object is less important; θ is the selected activation function, which introduces the nonlinear characteristics into the network, mainly converting the input signal of a node in the convolutional neural network model into an output signal.

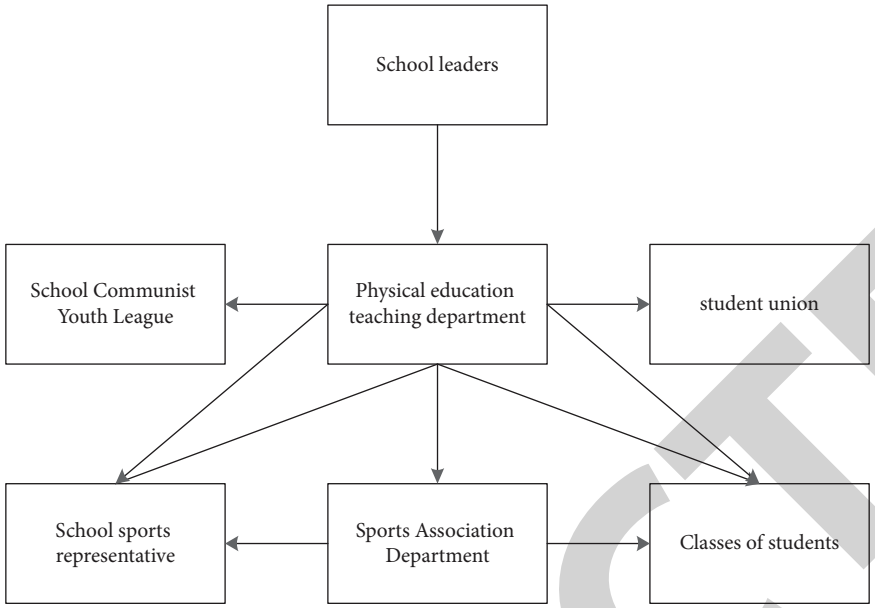

Figure 2: Structure of physical education teaching management in colleges and universities.

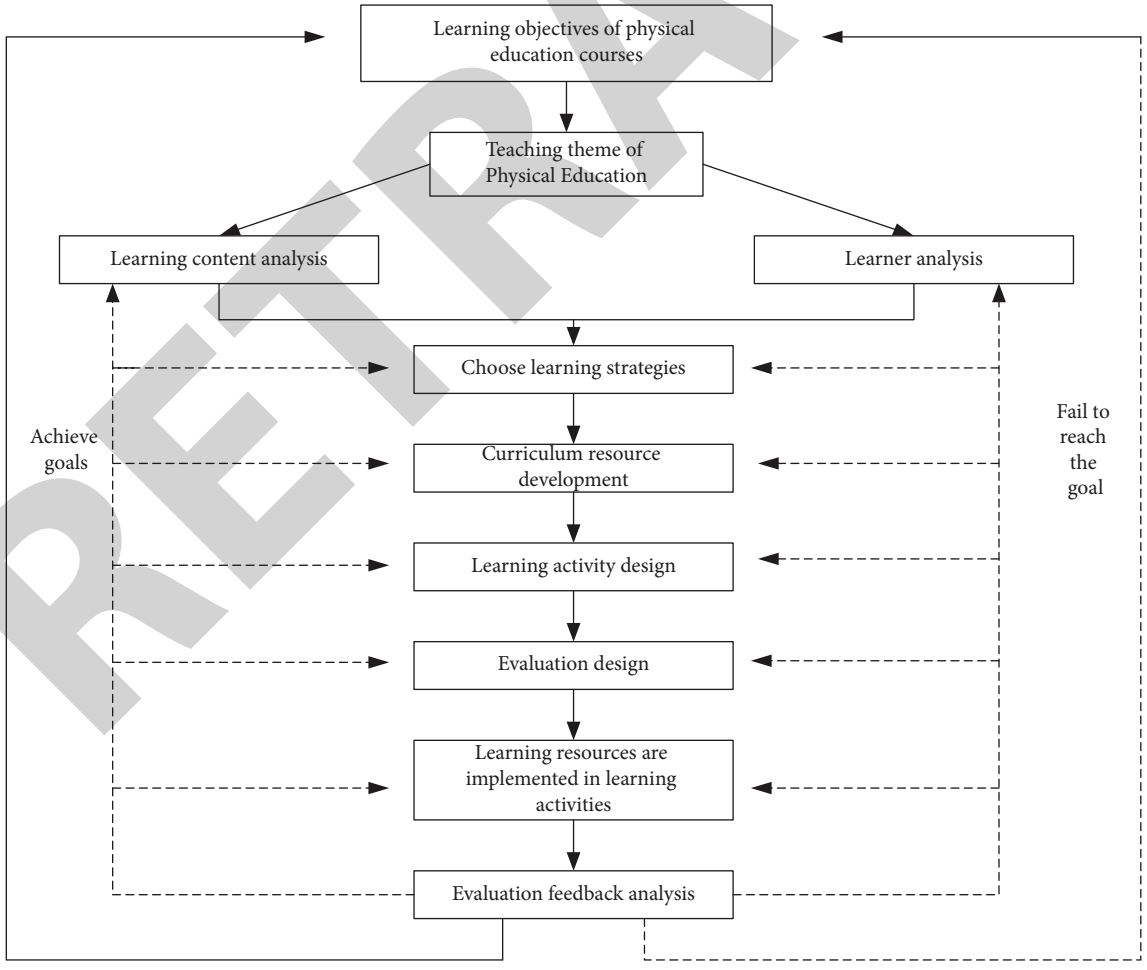

Figure 3: College physical education curriculum design pattern.

When designing the model of convolutional neural network, usually only a small number of full-connection layers are set because more full-connection layers may include too many neurons in the network, resulting in an increase in the amount of calculation for the model, which prolongs the calculation time spent in the training and detection stages of the network and will affect the fitting ability of the model to interested targets to a certain extent.

In order to resolve the abovementioned problems, the batch standardization layer uniformly distributes the scattered data, which is more conducive for the network to learn the hidden laws in the data. Batch standardization mainly includes the following aspects: calculating the sum and variance of the current batch data; A normalization function is designed to normalize the data of the current batch, so that the distribution of the data is within the range of (0, 1); Scale change and offset operations are performed on the data.

The mathematical expression of the formula for calculating the mean and variance of a batch of data is as follows:

$$\mu_B = \frac{1}{m}\sum_{i=1}^{m} x_i. \tag{8}$$

$$\delta_B{}^2 = \frac{1}{m}\sum_{i=1}^{m} (x_i - \mu_B)^2. \tag{9}$$

μ_B and μ_B are the mean and variance obtained after batch processing, respectively. The mean reflects the average level of a group of data, and the variance reflects the dispersion of a group of data. The smaller the variance, the more stable the group of data is, and the smaller the fluctuation around the mean.

In formulas (8) and (9), m is the amount of data in the batch, and x is the input data in the current batch. The mathematical expression of the commonly used formula when normalizing the mean variance of the data is as follows:

$$x = \frac{x_i - \mu_{_B}}{\sqrt{\delta_B{}^2 + \varepsilon}}, \tag{10}$$

where x is the normalized data and ε is a minimal integer to avoid denominator *0*. After normalization, scale transformation and migration are carried out. The formula expression used is as follows:

$$y_i = \gamma x_i + \beta, \tag{11}$$

where γ is the scale factor to adjust the size of the value and β is the translation factor to offset the data. Scale transformation and migration operations are the core of phi table standardization. γ and β are generally obtained during network training.

3.2. Wavelet Decomposition Algorithm. FT is a decomposition analysis method that is widely used in time series data. This method can decompose the time-domain signal into multiple frequency-domain signals and then analyze the overall data by analyzing the frequency-domain signals. Both time domain and frequency domain have their own unique functions and uses. This article mainly introduces three methods commonly used in time-domain and frequency-domain processing: Fourier series method, Fourier spectrum analysis method, and wavelet packet energy method. The time-domain function refers to a function that the data will change with the development of time. This method of observing and analyzing data based on time is analyzed from the time domain. FT greatly expands the means of signal analysis, and its transformation formula is expressed as follows:

$$F(\varpi) = \int_{-\infty}^{\infty} f(t) e^{-i\varpi t} dt. \tag{12}$$

$f(t)$ represents the time-domain signal, where t represents the time step, $F(\varpi)$ represents the frequency function (frequency signal), ϖ represents the frequency component of the signal at the circular frequency, and $F(\varpi)$ is also called the image function of $f(t)$. Both time-domain signals and frequency-domain functions are only methods of analyzing signals, rather than saying that a signal is sometimes divided into time-domain signals and frequency-domain signals. A signal can be either a time-domain signal or a frequency-domain signal, which can be converted according to the needs of research.

Inverse Fourier transform is a transformation that transforms frequency signals into time-domain signals. Its mathematical expression is as follows:

$$f(t) = \frac{1}{2\pi}\int_{-\infty}^{\infty} F(\varpi) e^{i\varpi t} d\varpi. \tag{13}$$

The idea of this method is to divide the larger information data into different smaller wholes from a larger part. First, it filters and classifies the initial data through filters to get the data that need to be segmented. Then, the two components are transformed by inverse wavelet transform to get a new data volume. Next, the appropriate threshold in each subband is selected to denoise the original signal.

Continuous wavelet transform is a common wavelet decomposition method. Its mathematical formula is as follows:

$$\psi_{ab}(t) = a^{-1/2}\psi\left(\frac{t-b}{a}\right). \tag{14}$$

a is the scaling factor ($a > 0$) and b is the translation factor. The values of a and b are adjusted to control the scale of wavelet transform and reach the peak value in the interval. The scaling factor and translation factor act on the curve equation to be deformed, and the shape of the curve can be controlled by changing the control parameters interactively, so as to obtain rich deformation effects.

The mathematical expression of continuous wavelet transform is as follows:

$$W_f(a,b) = \int_{-\infty}^{+\infty} f(t)\overline{\psi_{ab}(t)} dt. \tag{15}$$

In formula (15), $W_f(a,b)$ represents the coherent decomposition coefficient, $f(t)$ represents the initial source content, and $\overline{\psi_{ab}(t)}$ represents a similar function.

However, the correlation decomposition method needs to deal with all the decomposition coefficients, which not only produces unusable data but also wastes research time. Because the coherent decomposition method needs a lot of computational processing energy, a new decomposition function is constructed by the characteristics between the coherent decomposition methods. That is, the correlation between signals is used to construct a new wavelet basis function, and the parameters such as discrete expansion factor, translation factor, and orthogonal basis are adjusted according to the correlation between signals. The mathematical expression is as follows:

$$\begin{aligned} a &= a^j{}_o, \\ b &= ka^j{}_o b_o. \end{aligned} \tag{16}$$

Then, the mathematical expression of the calculation method of the function is as follows:

$$\psi_{jk}(t) = a_o^{-(1/2)}\psi\left(a_o{}^{-j}t - kb_o\right). \tag{17}$$

The discrete wavelet transform formula is as follows:

$$W_f(j,k) = \int_{-\infty}^{+\infty} f(t)\overline{\psi_{jk}(t)dt}. \tag{18}$$

In formula (18), $\psi_{jk}(j,k)$ represents the coherent processing coefficient, $f(t)$ represents the initialization data source, and $\overline{\psi_{jk}(t)}$ represents $\psi_{jk}(t)$ similar function.

The second step of wavelet transform is to reconstruct the wavelet coefficients and add all low-frequency signals and high-frequency signals to realize data restoration. The reconstruction method expression is as follows:

$$f(t) = cA_n l\left(\psi_{ik}(t)\right) + \sum cD_n h\left(\psi_{ik}(t)\right). \tag{19}$$

In formula (19), $f(t)$ represents the decomposed data set, $l(\psi_{ik}(t))$ represents the data filter, and $h(\psi_{ik}(t))$ represents the high-efficiency filter.

3.3. RNN Algorithm of Recurrent Neural Network. With the wide application of artificial neural network in various fields of life, it is found that the output of traditional neural network only considers the input impact of the previous moment and does not consider the input impact of other moments. Therefore, the method based on depth research helps to improve recognition ability of a single input when dealing with multiple inputs and outputs, especially in handwritten font recognition. However, in practical applications, people have higher requirements for time series, and the traditional methods based on time series can no longer meet these requirements, which requires some new technologies to solve this problem.

As shown in Figure 4, the basic structure diagram operation of RNN greatly reduces the amount of parameter training. Where u represents the weight of the input sample at that time, w represents the input weight and V represents

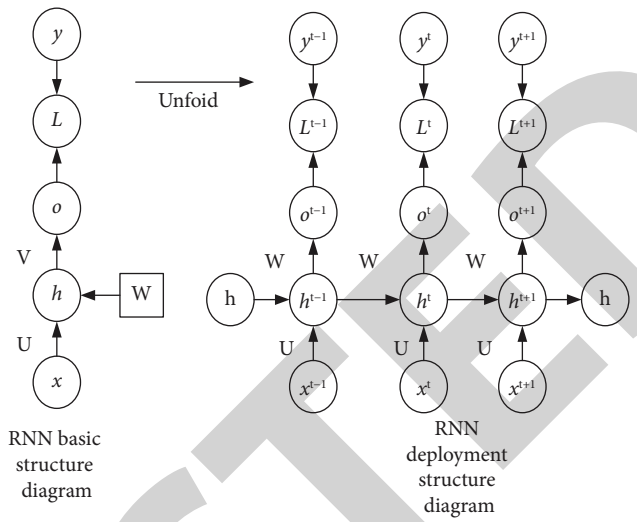

Figure 4: Schematic structure diagram of RNN.

the weight of the sample. An image super-resolution reconstruction algorithm based on the random walk model is proposed. The intermediate circulation structure shows that there are connections between hidden layers.

$$\begin{aligned} h_t &= f\left(Ux_t + Wh_{t-1} + b\right) \\ o_t &= Vh_t + c \\ y_t &= g\left(o_t\right). \end{aligned} \tag{20}$$

4. Experimental Statistical Analysis about Characteristics of Practical Training and Path of Education System on the Deep Innovation of School Sports Education

4.1. Analysis of Practical Training Characteristics on the Deep Innovation of School Sports Education

4.1.1. Research of Comprehensive Quality Test of Students Both Experimental Class and Control Class before Deep Learning. Using the test method, the physical fitness of students before the test was recorded, and the physical fitness of students in experiment group one, experiment group two, and control group before the test was tested for significant differences. The specific statistical results are shown in Table 1 and Figure 5.

Table 1 shows the statistical table comprehensive quality test analysis of pupils in the test group and the control group. The physical quality of pupils is statistically analyzed using five items: 50-meter sprint, sit ups, 800 meters, standing long jump, and change direction running.

As shown in Figure 5, the statistical chart of students' various physical qualities is shown. The statistical investigation and analysis are mainly carried out on students' 50-meter run, sit ups, 800-meter long run, standing long jump, and directional change run, and the average value changes of test group one, test group two, and control group are researched.

Table 1: Statistical table of comprehensive quality test analysis of pupils in the test group and the control group.

Index	Experiment group 1 Mean value	Experiment group 2 Mean value	Control group Mean value	F	*P*
50 meter run	72.88	74.37	73.72	0.228	0.796
Abdominal curl	75.06	73.23	75.06	0.181	0.835
800 meters	71.78	75.10	73.81	1.419	0.247
Standing long jump	72.71	72.87	73.75	0.159	0.853
Change direction run	72.41	75.63	73.58	1.120	0.331

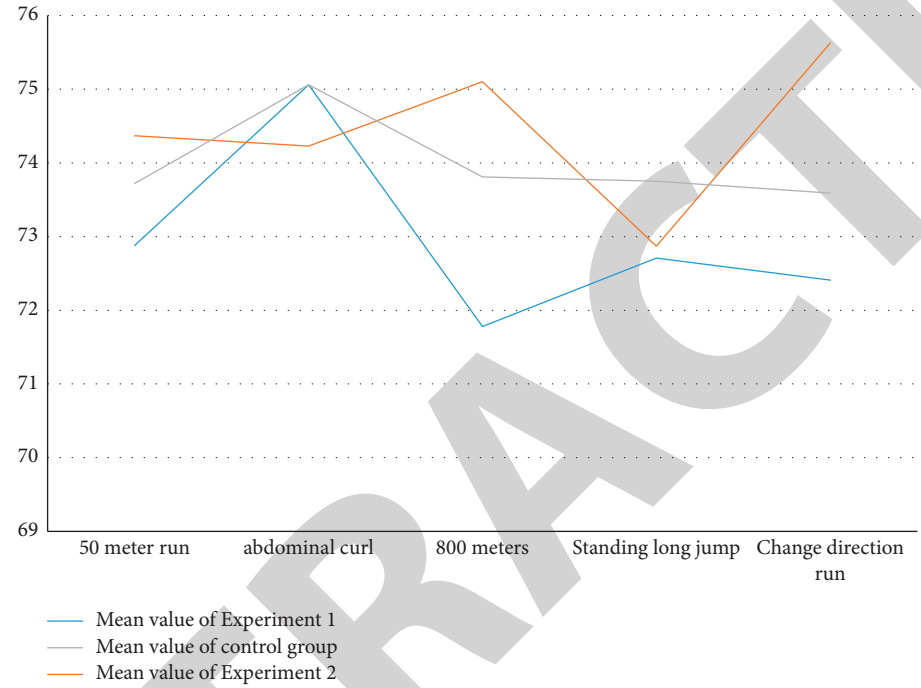

Figure 5: Statistical chart of students' physical fitness.

After the experiment, the data showed that values of the pupils in the experimental class 1, the experimental class 2, and the control class in the 50-meter running performance, the sit up performance, the 800/1,000-meter performance, the sitting posture forward-bending performance, and the cross direction change running performance were all less than 0.06, reflecting the differences between each group of objects.

Using the method of test, the students' sports basketball technology and technical and tactical application ability before the experiment were recorded, and the differences in both test group and the control group were investigated.

Table 2 shows the statistical table of sports basketball technology and practical application ability of students in each class. The data show that full-court passing can measure the students' basketball dribbling, passing, and high-low hand layup ability during the progress, the free throw can measure the students' single hand shoulder shooting ability, and the teaching competition can measure the students' comprehensive ability of practical basketball.

Figure 6 shows grade point average of whole field passing in the test group one is 63.75 points, the average score of the free throw is 65.94 points, the average score of the V-shaped layup is 61.25 points, the average score of the teaching competition is 61.56 points, the average score of the whole field passing in the control class is 63.44 points, the average score of the 60 s shooting is 60.63 points, and the average score of the V-shaped basket is 60.44 points.

As shown in Table 3, the front structure level indicates that students' answer and question clues are easy to be confused, the single point structure indicates that students can take questions to heart and at least one thinking operation can connect clues and questions, and the parallel structure indicates that students can grasp most of the relevant materials.

The data show that there are differences between the experimental group and the control group in the mean value of initial tissue, single tissue, multiple tissue, coexisting tissue, and hollow tissue, and the mean value of the experimental group 2 is higher than that of the experimental group 1 and the control group, which is conducive to the comparative observation before and after the experiment and the quick statistics of the research results.

As shown in Figure 7, it is known that there is no significant difference between the five dimensions of the three groups of subjects' in-depth learning: the initial tissue

Table 2: Statistical table of sports basketball technology and practical application talent of pupils.

Index	Experiment group 1 Mean value	Experiment group 2 Mean value	Control group Mean value	F	*P*
Dribble	63.75	64.67	63.44	0.127	0.881
Pitching	65.94	60.67	60.63	2.290	0.107
Lay up	61.25	59.33	58.44	0.641	0.529
Competition	61.56	60.33	58.75	0.564	0.571

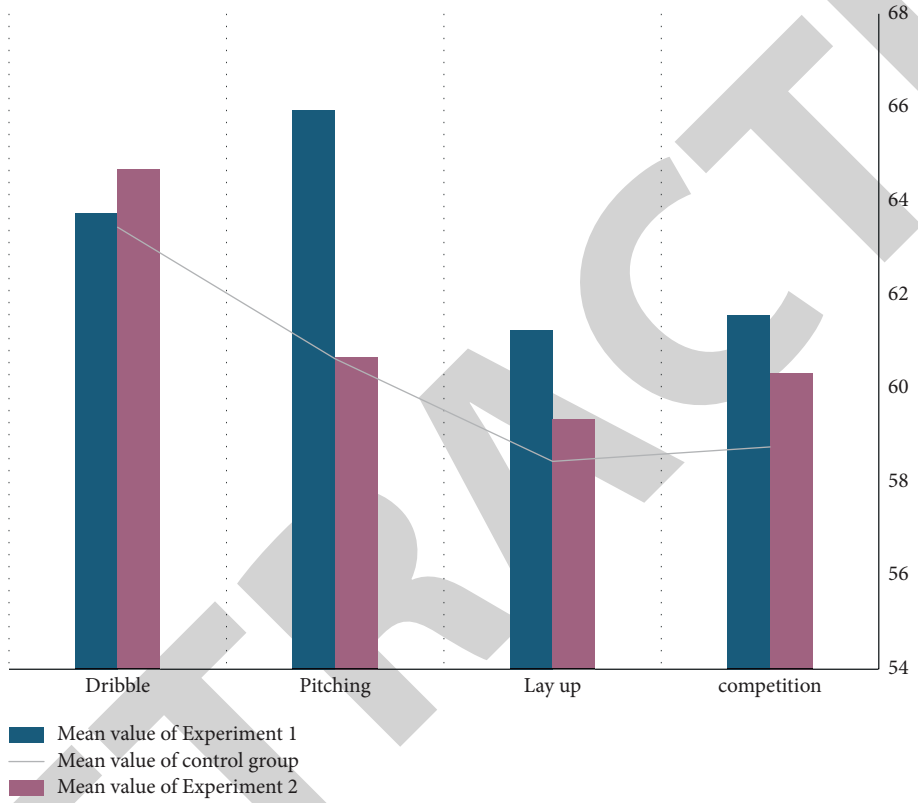

Figure 6: Statistical chart of basketball skills and practical ability of students in each class before the experiment.

Table 3: Statistics of students' in-depth learning ability.

Index	Experiment group 1 Mean value	Experiment group 2 Mean value	Control group Mean value	*F*	*P*
Initial organization	12.25	12.27	12.41	0.086	0.918
Single organization	11.41	12.03	11.81	1.370	0.259
Diverse organization	9.84	10.20	9.88	0.886	0.416
Coexisting organization	8.59	9.30	9.06	2.448	0.092
Cavitary tissue	9.44	9.57	8.94	3.002	0.055

layer, single tissue layer, multiple tissue layer, coexistence tissue layer, and void tissue layer, which indicates that the requirements are met when taking the test class 1 and test class 2 as samples for in-depth learning.

4.1.2. Analysis of Physical Health Test of Students in the Test Group and Control Group after Deep Learning and After Deep Research. Table 4 shows the statistical table of physical health test analysis of pupils in the test group and the control group after deep learning. The data test indicates that the values of the test group and the control group in the five item tests are less than 0.05, indicating that the 50-meter run scores of the three groups of subjects are significantly higher than the sit ups scores.

Figure 8 shows the statistical chart of students' physical health test scores in the test group and control group after deep research. The data show that the increase in the scores

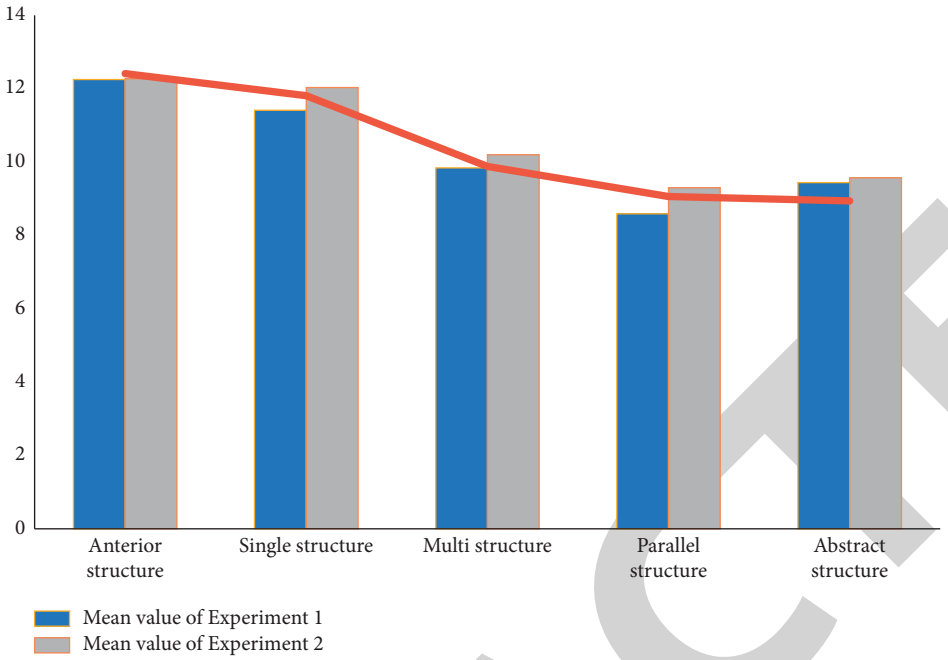

Figure 7: tatistics of college Students' in-depth study and professional research.

Table 4: Statistical table of physical health test analysis of pupils in the test group and the control group.

Index	Experiment group 1 Mean value	Experiment group 2 Mean value	Control group Mean value	F	*P*
50-meter run	80.06	78.70	74.12	6.069	0.003
Abdominal curl	82.22	79.33	76.09	4.681	0.012
800 meters	80.78	78.83	74.22	8.426	0.011
Standing long jump	79.19	77.43	74.06	3.865	0.024
Change direction run	78.91	75.80	75.23	3.149	0.048

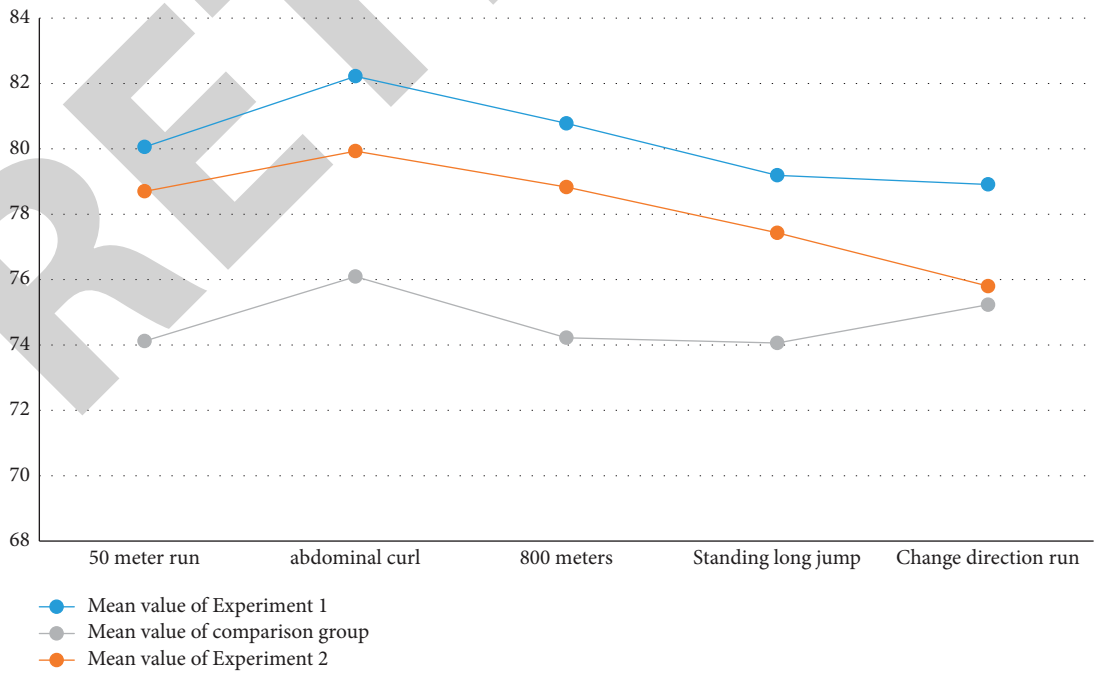

Figure 8: Statistical chart of students' physical health test scores in the test group and control group after deep research.

Table 5: Statistical table of physical education teaching objectives.

Teaching objectives	Frequency (%)	Ranking
Sports participation	91.8	1
Motor skills	89.7	2
Mental health	81.6	4
Social adaptation	85.7	3
Good health	73.4	5
Career development	59.1	6

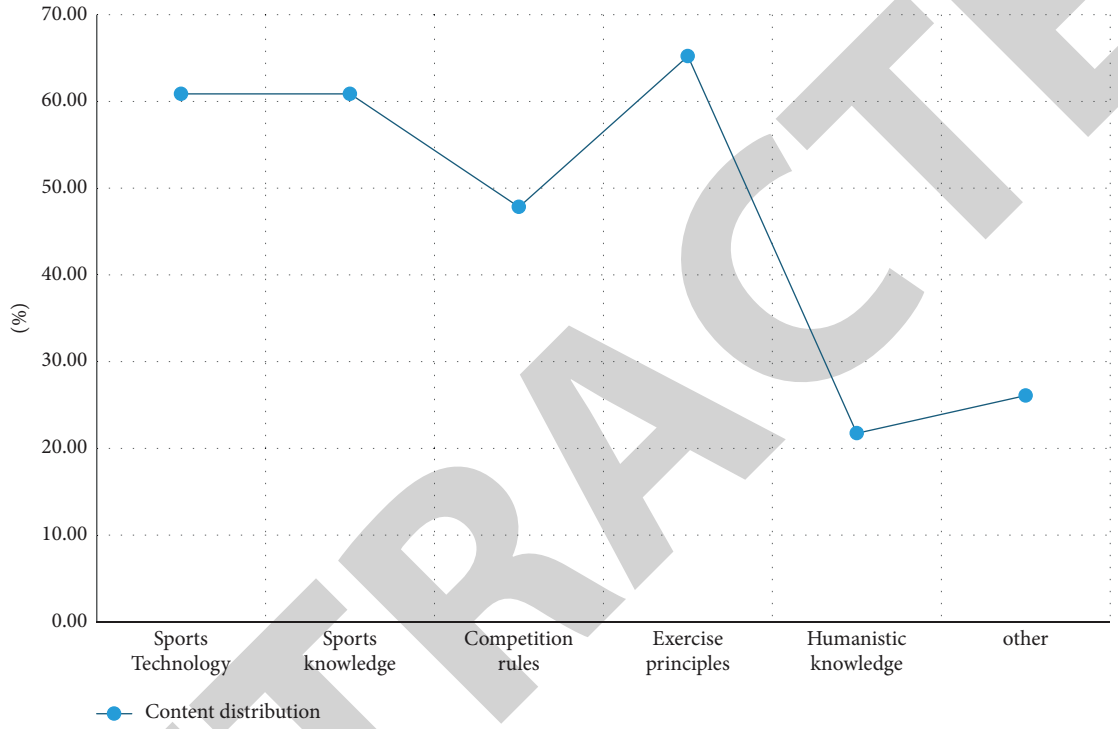

Figure 9: Distribution of teaching contents of sports theory.

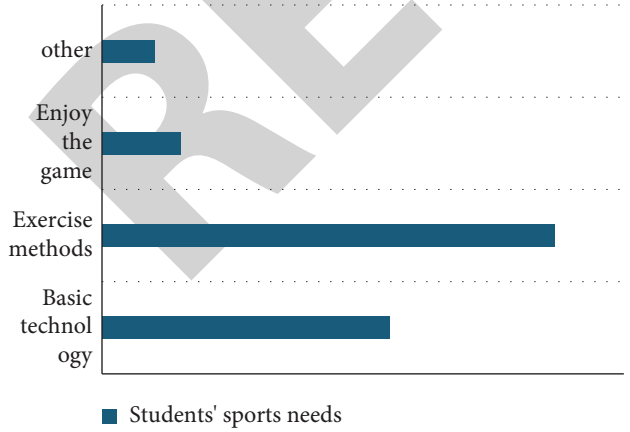

Figure 10: Distribution of students' sports needs.

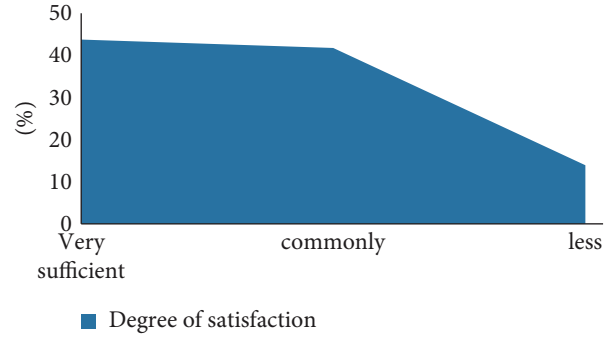

Figure 11: Satisfaction degree of students' needs in physical education course hours.

of each item in the experimental group 1 is the most obvious, followed by the increase in the scores of the experimental group 2, and the smaller increase in the scores of the control group, indicating that the practical training of physical education courses based on in-depth learning helps students better participate in the sports education mode and it greatly promotes students' physical exercise.

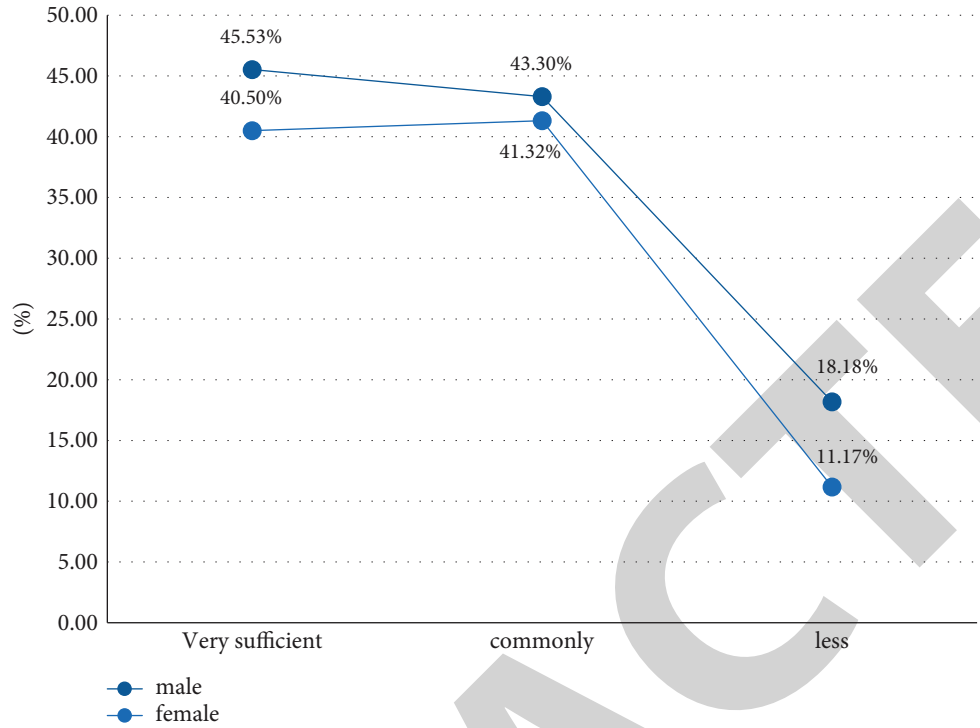

Figure 12: Statistical chart of the difference between male and female students' demand for physical education course hours.

4.2. Investigation on Academic Innovation of School Sports Education with In-Depth Research. To understand the situation of the teaching content of physical education courses in colleges and universities efficiently, it was planned that the form of questionnaire would be used to investigate the teaching of physical education courses in various colleges and universities in order to find the problems existing in school sports education academic organization content at present, analyze the reasons, and give corresponding suggestions and solutions.

Talent training focuses on the connection with the actual position, as well as the post skills and ability requirements. Under such a clear curriculum and teaching system, all courses need to be paid more attention. As an important part of the professional curriculum system in secondary vocational schools, physical education puts forward higher requirements for its educational mode. Starting with the current condition about secondary vocational education, this article analyzes the problems existing in the teaching reform of physical education and discusses the corresponding reform measures against these problems.

As shown in Table 5, through the analysis of six aspects of sports participation, sports skills, mental health, social adaptation, physical health, and career development, this article discusses the direction of college physical education model objectives and formulates frequency statistics and corresponding rankings for different college physical education teaching objectives.

The data show that more than 90% of attention of learning to sports education and skill teaching is still high and have the lowest requirements for career development. The main teaching direction is students' sports participation and less personal guidance for students, combined with the characteristics of their careers, so that they can go to the society. It is difficult to develop sports ability and habits after participating in work.

Figure 9 shows the content distribution of sports theory teaching. The data show that the content distribution of sports theory teaching is mainly divided into sports technology, sports health knowledge, competition rules, exercise method principles, and sports humanistic knowledge. The proportion of exercise method principles is as high as 65.22%, and the proportion of sports humanistic knowledge is as low as 27.74%.

As shown in Figure 10, the data show that half of the students believe that physical education courses can be used to learn the methods needed to exercise, 33% of the students believe that physical education courses can help obtain the corresponding basic sports skills, and only 9% of the students believe that through physical education courses, they can better enjoy the game.

Figure 11 shows that according to the data of physical education class hours, nearly half of the students think that the current physical education class hours are enough, some students think that the class hours are not enough, and some students think that it is average.

Figure 12 shows the statistical analysis chart of physical education curriculum needs of male and female students. The actual investigation and analysis are carried out with three options: very sufficient, general, and less. The data show that the number of boys' actual feedback is greater than that of girls.

In the group of boys, nearly one-fifth of boys think that the amount of physical education class hours is not enough.

The satisfaction degree of girls' physical education class hour demand is higher than that of boys. Girls' satisfaction is 1.65, boys' satisfaction is 1.77, and P is 0.038: there is a significant difference.

5. Conclusion

This article recommends the concept, principle of concept, development trend of in-depth research technology, and the unique characteristics of in-depth research learning compared with the old learning model. Then, it introduces the teaching characteristics of college physical education curriculum, which are divided into school sports education academic organization and the needs of physical education curriculum. Then, it introduces the research background and direction of this topic, focusing on the analysis of the practical training characteristics and teaching system innovation of the school sports education system combined with deep learning technology. This article introduces the algorithm formula of practical training characteristics of the college physical education courses around the deep research mode, mainly including convolution network algorithm, wavelet decomposition algorithm, and RNN algorithm analysis of cyclic neural network. Finally, about the experimental statistical discussion of practical training features of school physical education curriculum based on deep learning and the reform path of the teaching system, it is verified that the combination of the deep learning model and practical training of college physical education curriculum can maximize the growth of school sports education achievements, and students can effectively gain knowledge from physical education curriculum and improve their physical quality.

Data Availability

The experimental data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares no conflicts of interest regarding this work.

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