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Research Article

Construction and Analysis of Computer Model in Sports Education Effect Evaluation Based on Grey System Theory

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College physical education is the most common course type in college students' education. It undertakes the important responsibility of improving students' physical quality. In order to make effective use of teaching curriculum, the evaluation of curriculum reform is the key of research. Based on this, this paper puts forward the evaluation of physical education teaching effect based on grey system theory. This paper expounds the research progress of teaching effect evaluation and then analyzes the grey system theory. In the evaluation, the key of AHP is to control the traditional fuzzy analysis method, which can be optimized by using fuzzy analysis method. At the same time, the grey system theory is used for comprehensive analysis to establish sports teaching scoring index effect. Through the analysis of physical education teaching examples, the effectiveness of grey system theory in evaluating teaching is confirmed. The application of grey system theory in teaching effect evaluation is more intuitive, which can make full use of the existing whitening information and reduce human errors. In addition, it can comprehensively consider the impact of each sample data on the final result to the greatest extent, which is closer to the actual evaluation result than the theoretical fuzzy evaluation.

1. Introduction

Educational evaluation refers to the process of determining the corresponding objectives according to the established objectives, establishing a scientific index system, systematically collecting information and qualitative and quantitative analysis, and evaluating the effectiveness and working state of the educational system according to objective value standards. The obtained information and materials provide an important basis for the scientific decision-making of education. The difference from educational measurement is that the latter focuses on the quantitative regulation of educational phenomena, focuses on obtaining objective facts, and is often a single measurement. Although the former also pays attention to quantification, it also needs qualitative analysis and makes a comprehensive value judgment on a large number of objective facts obtained by using mathematics and other tools.

Educational evaluation started very early and involved a lot of content. It is analyzed from the perspective of evaluation object, including school evaluation, teacher evaluation, and student evaluation. In addition, the education supervision department will also participate in teachers' teaching evaluation. In addition to the educational content, it also includes some sports policies, which rose in the 1930s and attracted extensive attention. The educational evaluation is teaching effect evaluation. It is not only an important part of educational management but also an important means of implementing scientific management [1]. Quantitative analysis has been widely used in the research of educational evaluation since 1980s; other analytical methods for its derivation are also increasing. Education evaluation starts to pursue multiple indicators from this and is not limited to the centralized and fixed model [2]. In foreign research theories, students' evaluation is considered to be the most important part and attaches great importance to students' self-evaluation. We hope to improve students' self-ability in this way and have achieved good results [3]. The evaluation object has gradually shifted from individual students to student factors [4]. Domestic colleges and universities have carried out large-scale reform of educational evaluation, and various evaluation models are emerging [5]. With

the development of quality education, a variety of quality education evaluation models began to appear, such as analytic hierarchy process and personality development education evaluation model.

In the past, the methods used in the evaluation of educational effect are not perfect and have great fuzziness. The grey theory is used to evaluate the final results of sports teaching, and the evaluation index is constructed based on the comprehensive opinions of experts. It provides more scientific and objective data for the evaluation of teaching quality.

This paper puts forward the evaluation method of physical education teaching effect based on grey system theory. This paper expounds the research progress of teaching effect evaluation and analyzes the grey system theory. The research is divided into five parts. The first part expounds the research background of teaching evaluation. The second part cites the relevant literature. The third part expounds the design of physical education teaching effect evaluation, including the construction of physical education teaching mode, the construction of intelligent algorithm, and fuzzy hierarchical evaluation. The fourth part discusses the grey comprehensive evaluation index and data sorting. The fifth part summarizes the full text.

2. Research on Grey System Theory

Educational evaluation theory has developed in an all-round way in recent years, and quantitative evaluation theories and methods have also been emerging and improved. Figure 1 is a general method in general, which are difficult to analyze comprehensively. Among many quantitative theories and methods, grey system theory has attracted much attention. Because this measurement method contains some mathematical information parameters, it can be used to solve the early problems of communication system [6] and was widely used in the fields of economy, agriculture, medical treatment, ecology, and so on [7]. Grey algorithm pays more attention to the measurement object of target extension. The larger the target cross-section is, the stronger the measurement performance is. Grey system modeling is one of the mathematical systems to determine the factors of various systems [8].

With the deepening of the research of grey system theory, it combines a variety of algorithms and has a wide range of research applications in a variety of fields, for example, provide corresponding promotion in the field of grain crop growth [8]. Grey system theory promotes the objective development of medicine in this regard [9]. Moreover, in the field of economics, grey system theory also plays an active role in financial relevance analysis [10]. Correlation degree is a parameter for judging the correlation between different objects, which can measure their correlation order and arrange them [11]. In this paper, the parameter sequence of correlation matrix is described in data initialization [12], marked as:

$$x_t^{(0)}(0) = \left\{ x_1^{(0)}(0), x_2^{(0)}(0), \cdots, x_n^{(0)}(0) \right\}. \quad (1)$$

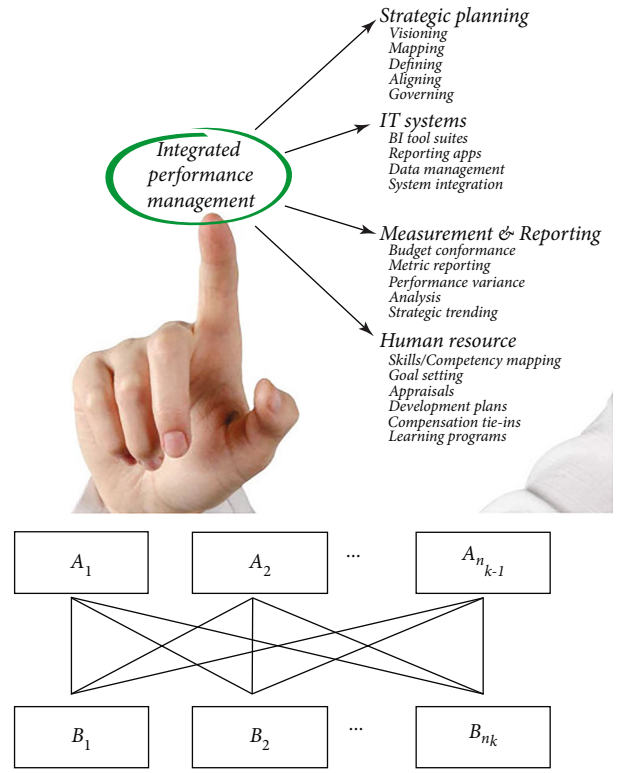

Figure 1: General and common measurement methods of teaching evaluation.

Then, calculate the difference between environmental factors and subjective factors at a certain time point, and the formula is expressed as:

$$\Delta_t(i,0) = \left| \left\{ x_t^{(0)}(i) - x_t^{(l)}(0) \right\} \right|, \quad (2)$$

where $i = 1, 2, \cdots, n$. Finally, the calculation results of correlation values of different factors are as follows:

$$\zeta_i(0) = \frac{1}{n} \sum_{i=1}^{n} \frac{\min\limits_t \min\limits_t \left| x_t^{(l)}(i) - x_t^{(l)}(0) \right| + \zeta \max\limits_t \max\limits_t \left| x_t^{(l)}(i) - x_t^{(l)}(0) \right|}{\left| x_t^{(l)}(i) - x_t^{(l)}(0) \right| + \zeta \max\limits_t \max\limits_t \left| x_t^{(l)}(i) - x_t^{(l)}(0) \right|}, \quad (3)$$

where ζ represents the resolution coefficient, there is no fixed value standard, and the empirical value is 0.5.

3. Evaluation Design of Physical Education Teaching Effect

3.1. Construction of Sports Teaching Mode. Due to the rapid development of science and technology, how to improve teaching evaluation has become an important assessment index. Computer technology is a new teaching method which is different from traditional physical education. It uses computer technology to make the classroom more vivid and arouse students' enthusiasm. Study is very important to students, so is sports. Especially now the country's main propaganda direction is the national fitness, which is an important

direction that benefits the country and the people. The construction and realization of the research algorithm will be mentioned in the following narration. This is of great help to the current teaching situation, strengthening students' resistance and helping schools and families manage the growth of children together. Table 1 is a survey display table of computer technology in this paper. The details are shown in Table 1.

Table 1 is a questionnaire of computer technology mentioned in this paper. It shows that the items in the survey includes swimming, ball games, etc. The main features and contents of them are discussed in detail in the table, and a good recognition has been gotten. The main characteristic of ball games is that people can get the whole body exercise in the outdoor, so as to enhance the body's own muscle content. At the same time, the research on sports is not mentioned in the above table. This technology has a great effect on the teaching of physical education, and the application range of this technology has been improved. The following is the research idea of this paper. Through Internet technology, the login and management interface can be set. After setting the login and management interface, all kinds of information collected should be summarized and processed. The collected and processed information is then stored in the database. In the process of building the system model based on intelligent algorithm in this paper, registration and login are the portal of a website. Its design attitude is to treat guests. Although users may only spend very little time in registration and login interaction each time, this "moment" is very important. The interaction relationship between users and registration and login is a connecting node. All the details of registration and login affect whether they can complete the most basic tasks set by the product strategic positioning to attract the users they want. The login interface and information feedback processing skills are the problem to be aware of. According to the intelligent algorithm, the multimedia sports teaching platform can be designed. Then, in the physical education platform, according to teaching function, the actual login interface can be chosen. The login interface mainly consists of course selection system, course classification, and opinions and suggestions on physical education. All these information can give us practical feedback through the system model. After the feedback is completed, the overall calculation data should be planned and analyzed. After the analysis is completed, the data of the actual designed system model is input into the model library, as shown in Figure 2.

As shown in Figure 2, it is the research idea of teaching based on computer technology. The overall structure of PE class is introduced. It mainly includes the practice course and the theory course. The theory course is mainly to let students learn something about the notice in the PE class and the interpretation of the current form of physical education. No matter what sport you play, be prepared for it. The main content of the practice class is to let the students feel the physical exercise personally, so that they can give full play to their physical ability. In this way, they can enjoy the sports and enhance their physical fitness. The computer technology still has the very big function in the physical education research and promotes the present physical education teaching progress and the reform.

3.2. Construction of Intelligent Algorithm. Nowadays, science and technology are developing rapidly, and physical education is constantly innovating. After completing the construction and realization of the research algorithm of college physical education based on computer technology, the next step is to calculate the formula of the research algorithm. The formula of the algorithm takes up a large amount of space in the environment where the program runs, which is an important node for a structure. Various competitions to promote the enthusiasm of physical education, but these competitions cannot promote the reform better. This requires a powerful computer program to digitally simulate, imputing the same types of subjects into the system for 3D simulations, which is more persuasive. Intelligent transformation algorithm is a key node in this technology. The adaptive optics of computer technology is developing towards high performance and high spatial resolution wavefront correction. The number of actuators of wavefront correctors has increased from dozens to hundreds to thousands, which requires that the spatial resolution of the Hartmann shaker wavefront sensor matching them should be improved accordingly. Intelligent transformation algorithm is widely used in digital signal processing because of its fast operation speed and small memory required. In the process of solving the linear equations determined by the formula, the diagonalization of the coefficient matrix of the equation needs to be realized; this calculation can finally be carried out by computer transformation, so that the formula can be solved quickly. Firstly, the basic concept of entropy of data mining algorithm needs to be explained. Let P be the probability of the value of the property C. And it is specified that the summation of P is 1. So:

$$H(p_1, p_2, \cdots, p_s) = \sum_{i=1}^{s} (p_i \log p_i). \tag{4}$$

The entropy of track and field teaching is closely related to the optimization space of the algorithm. This is mainly because entropy determines the position H of the attribute value in the data. That is to say, the entropy is proportional to the ability to compute space improvement. The concept of information gain also needs to be understood and analyzed. Information gain is a kind of difference value, which is the difference between original demand and new demand, and is determined by the analysis of the original entropy value and the weighted entropy value. The following formula is used to calculate and analyze the information gain:

$$G(D, S) = H(D) - \sum P(D_i) H(D_i). \tag{5}$$

In college track and field teaching, D is the data set, and S is the number of data attributes. In the calculation of data mining algorithm, the maximum value of the node is always selected for analysis and calculation, and the analysis is carried out through the established calculation steps in this

Table 1: Sports appraisal questionnaire.

Sports items	Features	The main advantage	Welcomed by students
Ball sports	Physical education teachers have different levels of sports skills. The age of teachers is increasing.	As the teaching difficulty of some teachers increases, the effect of teaching achievement demonstration is also decreasing.	High
Run	Wide application of information technology.	These problems have been well solved in teaching.	High
Swim	Multimedia is introduced into the process of physical education teaching.	It can not only stimulate potential interest but also improve the quality of teaching.	High

paper. However, in fact, every value calculated in this paper can be branched, but there are not so many resources in the practical process of this paper for branching calculation, and usually, only the maximum value is calculated and analyzed. The following formula is used to calculate the desired information for sample classification. Thtpkmwis is the probability, and Btpgjv is the average entropy. In addition, the formula for calculating the classified information entropy by dividing T by A is as follows:

$$\text{Info}(T) = \sum_{i=1}^{n} p_i \log_2(p_i), \tag{6}$$

where T is the probability and $\text{Info}(T)$ is the average entropy. In addition, the formula for calculating the classified information entropy by dividing T by A is as follows:

$$\text{Info}_A(T) = \sum_{j=1}^{m} \frac{|T_j|}{|T|} \text{Info}(T_j). \tag{7}$$

According to the definition of information gain, the following formula is actually used for calculation:

$$\text{Gain}(A) = \text{Info}(T) - \text{Info}_A(T). \tag{8}$$

In addition, another formula that needs to be introduced emphatically in this paper is the calculation formula of degree of interest. The calculation formula of degree of interest I is as follows:

$$I = \text{Interest}(X \Rightarrow Y) = \frac{\text{confidence}(X \Rightarrow Y) - \text{support}(y)}{\max\{\text{confidence}(X \Rightarrow Y), \text{support}(y)\}}. \tag{9}$$

The calculation of the above steps is the main calculation step of the intelligent algorithm, but it can be found that the above calculation formula is not exactly the same with the traditional intelligent algorithm. This is because the calculation of the algorithm is optimized in the process of calculation, making it more suitable for the study of application in the optimization of national sports teaching strategies. The following figure is the main operation flow chart of the intelligent algorithm in this paper, which is shown in Figure 3.

As shown in Figure 3, it is the main step flow chart of the intelligent algorithm used in this paper for the research.

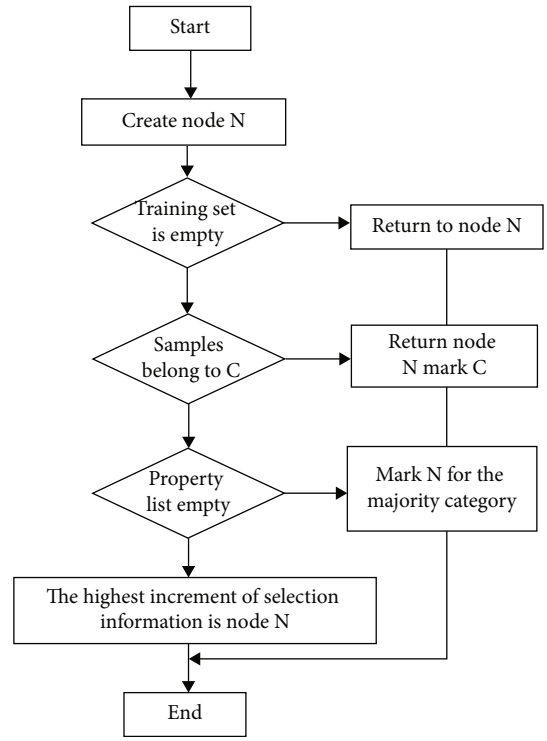

Figure 2: Process of physical education based on computer calculation method.

According to the text, the study first enters the project name, and then, the system makes automatic selection; the main parameters are on the main page. The designer then enters the number of people and the name of the school, and the program automatically generates the appropriate form for later viewing. The application of intelligent algorithm makes the reform of multimedia faster and faster.

3.3. Fuzzy Hierarchical Evaluation. Analytic hierarchy process is a combination of quantitative and qualitative methods. It can be applied to a variety of criteria determination and widely solve various problems. When calculating different algorithms, different decision-making problems are divided into levels, and then, quantitative and qualitative analyses are carried out [13]. In the use of analytic hierarchy process, first clarify the problems, determine the system objectives, and analyze the width and constraints of decision-making problems [14]. The first step is to establish an analysis system and build the model from different analysis angles. To facilitate calculation, it is often illustrated in

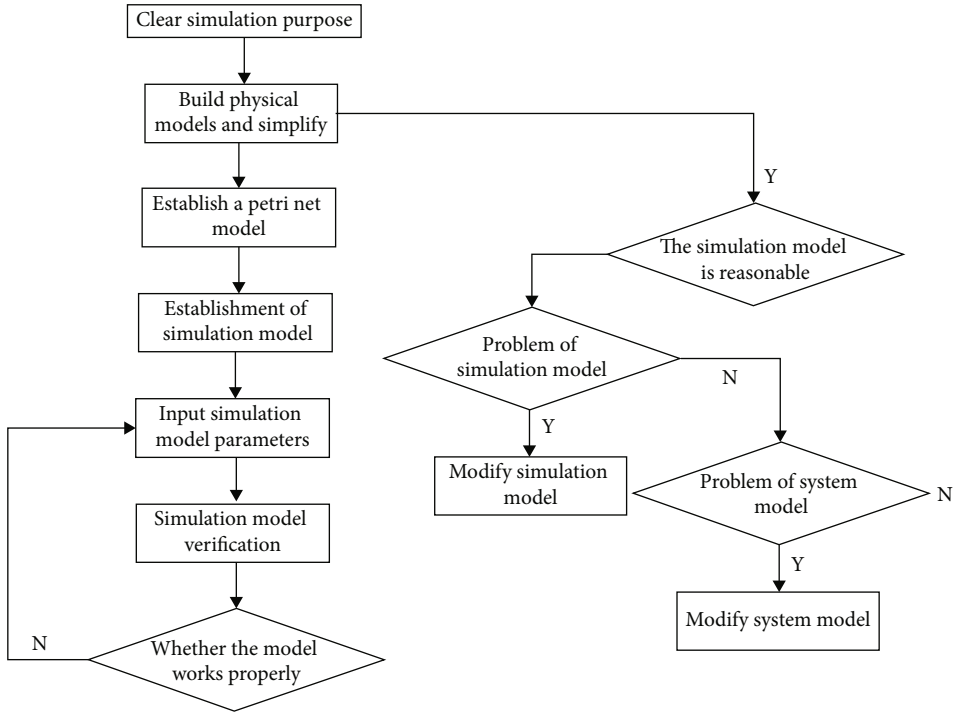

Figure 3: English learning model system hardware structure of the situation.

Table 2: RI value of average random consistency index.

n	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45

the form of block diagram. If there are many factors and indicators in the analysis process, more in-depth hierarchical dissection can be carried out. This process will produce different hierarchical relationships, but the final indicators have the same operation priority. At present, the 9-scale method is mainly used to divide and register the indicators, assign values, establish a matrix, and then extract useful parameters. By evaluating the importance, the priority of constructing matrix judgment is made. However, from a psychological point of view, too many scores will affect the judgment accuracy, so 1-9 is the most appropriate [15].

The normalized eigenvector of the maximum eigenvalue corresponding to the judgment matrix reflects the ranking of relative importance [16]. There must be a certain degree of nonheterogeneity. If the results are consistent, the matrix should meet the following requirements:

$$a_{ij}a_{jk} = a_{ik}. \tag{10}$$

Determine whether the matrix meets the requirements. Consistency determination is required. Any two lines of A are proportional, and the scale factor is greater than zero.

$$\mathrm{CI} = \frac{\lambda_{\max} - n}{n-1}. \tag{11}$$

Find the RI value according to the calculated CR value. Table 2 shows the average random consistency index RI value.

The total sorting weight synthesizes the weight under the single criterion. Assuming that the upper level contains m elements, the total ranking is represented by a, and the next level V contains n elements, and the single ranking weight of A is represented by b. After the weight of each index is obtained:

$$b_i = \sum_{j=1}^{m} b_{ij}a_j. \tag{12}$$

It can be seen from this that the number of conformance tests needs to be carried out many times. Moreover, even if it passes the consistency test, it will be affected by subjective factors. Secondly, it is necessary to calculate the total ranking consistency test.

Chromatographic analysis is widely used in evaluation, but its defects are also very obvious. In the application of this algorithm, it is carried out from beginning to end, and consistency measurement is required for each step. If the timely determination result is reasonable, further overall judgment is needed. Because the process is complex, in the actual calculation, the calculation results will be inconsistent with the actual situation. This paper mainly uses the three-scale method. It is calculated according to the example of importance only through two-to-two comparative analysis. If these parameters are consistent, 1 is used; otherwise, 0.5 is used. A is used to represent the three-scale comparison matrix. The value of a is zero and equally important. The value of a is

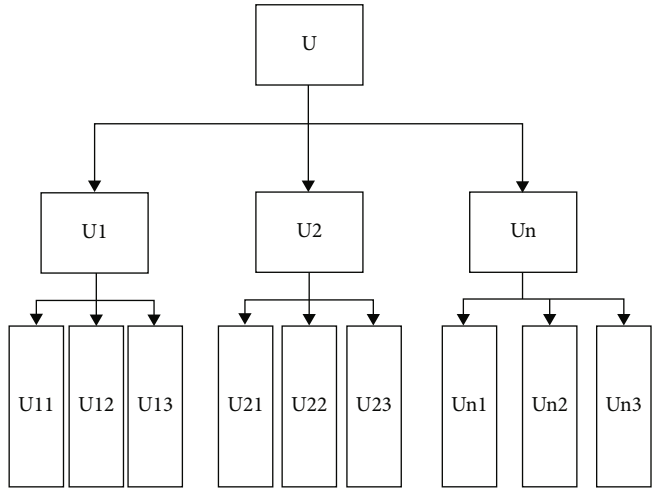

Figure 4: Multilevel evaluation index system.

Table 3: Sample matrix.

Index	1	2	…	P
U_{11}	d_{111}	d_{112}	…	d_{11p}
U_{12}	d_{121}	d_{122}	…	d_{12p}
…	…	…	…	…
U_{mn}	d_{mn1}	d_{mn2}	…	d_{mnp}

Table 4: On table method of calculating weight vector of grey evaluation.

Ash	d_{ij1}	d_{ij2}	…	d_{ijp}	Total
1	$f_1(d_{ij1})$	$f_1(d_{ij1})$	…	$f_1(d_{ij1})$	$\sum 1$
2	$f_2(d_{ij1})$	$f_2(d_{ij2})$	…	$f_2(d_{ijp})$	$\sum 2$
…	…	…	…	…	…
G	$f_g(d_{ij1})$	$f_g(d_{ij2})$	…	$f_g(d_{ijp})$	$\sum g$
Total					Σ

0.5, and the value of unimportant A is 1. It shows that the algorithm has other shortcomings. For example, personal factors will affect the judgment of results. Affected by the environment, it is prone to errors, which can not pass the test, and these external effects are very complex, and fuzzy analytic hierarchy process needs to be used for evaluation.

Fuzzy theory has attracted much attention in recent years and has been applied in many fields. This theory is based on set theory. Assuming that the factor universe is represented by U, the evaluation level universe is represented by V, the membership degree of factor u to V is represented by W, and the fuzzy weight vector is expressed as:

$$W = (w_1, w_2, \cdots, w_n). \tag{13}$$

3.4. Grey System Theory Evaluation Design. The teaching system itself is a grey system with many factors and uncertainties. Therefore, the grey system theory can be used for research in theory [17]. At present, there are many studies on education evaluation, but there are no fixed requirements for which evaluation algorithm to adopt. Most studies believe that multiple algorithms should be used to determine at the same time [6]. In the previous research and analysis, some scholars have applied the grey system theory to education evaluation and confirmed the feasibility of the algorithm. However, the application of the algorithm is too single to obtain more real evaluation information, so it needs to be improved [18].

In the actual calculation process, there are many times no data needed for quantitative analysis. Therefore, in practice, these data need to be transformed to generate white hot function. The white heat function can be analyzed according to the measured value. In the actual system theory, the grey number is composed of different actual measurement parameters, which are equally important and have different weights. The results of grey statistics can reflect the attributes of an index in the set. When it is necessary to understand the importance of an index, it can be realized by grey clustering technology. In actual teaching, due to the different meaning of data, there will be unequal and different data analysis. In the application of grey system theory, it is necessary to convert the original data into the initial value and then establish the reference data column. For the original data, dimensionless processing is required. Linear method is adopted. After the standardization process is completed, the relationship between sequences can be calculated. And the formula is as follows:

$$\begin{gathered} \Delta_t(i,0) = \left\{ x_t^{(l)}(i) - x_t^{(l)}(0) \right\}, \\ R = E \cdot W, \\ E = \begin{bmatrix} \zeta_1(1), \zeta_1(2), \cdots, \zeta_1(n) \\ \zeta_2(1), \zeta_2(2), \cdots, \zeta_2(n) \\ \cdots \\ \zeta_n(1), \zeta_n(2), \cdots, \zeta_n(n) \end{bmatrix}. \end{gathered} \tag{14}$$

Table 5: Evaluation system for the effect of physical education.

First level index	Two level index	Three level index	Weight
Teaching evaluation	Teaching preparation	Preclass preparation	0.1289
		Teaching task	0.4970
		Teaching contents	0.1813
		Teaching key points	0.1928
	Teaching organization	Teaching method	0.2580
		Organizational process	0.3103
		Guidance technology	0.1355
		Teaching emphasis	0.2962
	Exercise load	Load content	0.2523
		Load density	0.1725
		Load strength	0.2216
		Load adjustment	0.1222
	Teaching effectiveness	Control ability	0.2364
		Student performance	0.3576
		Teach their aptitude	0.2692
		Mission accomplished	0.1368
	Teaching characteristics	Teaching method	0.3849
		Teaching devices	0.3927
		Content of courses	0.2224

Sort by R value. Establish the evaluation system. Select a reasonable evaluation grade, represented by V. In the article, 5 evaluation grades are designed. Determine the set of evaluation factors, represented by U. Establish the evaluation matrix, expressed by R, expressed as:

$$R = \left(r_{ij}\right)_{n\times m}. \tag{15}$$

Combined with the previous design, the teaching evaluation system is established, and then, the comprehensive evaluation is carried out. The model is represented by B; then, the evaluation index is processed to obtain the evaluation results, and finally, the correlation degree is calculated.

The evaluation object set is represented by X and expressed as $X = (x_1, x_2, \cdots, x_p)$.

In the application of the algorithm, the first level fuzzy evaluation vector is calculated, and the formula is:

$$B_1^s = W_{B_1} R_{B_1}^s, \tag{16}$$

where $s = 1, 2, \cdots, P$ and then calculate the secondary evaluation matrix

$$R_A^s = [B_1^s, B_2^s, B_3^s, B_4^s], \tag{17}$$

where $s = 1, 2, \cdots, P$. Calculate the evaluation result vector. The average value is selected as the reference index set and expressed as $x_0(i)|i = 1, 2, 3, 4, 5$. The correlation analysis is recorded as $\{x_i(j)\}$. The grey correlation coefficient is calculated according to the correlation degree between various factors, and the calculation formula is:

$$\zeta_s = \frac{1}{5}\sum_{j=1}^{s} B_{sj}. \tag{18}$$

4. Result Analysis

4.1. Grey Comprehensive Evaluation Index. In order to facilitate calculation, the three-level evaluation problem is analyzed, which can be extended to more levels of evaluation. The evaluation index system is established, see Figure 4 for details. In the figure, U represents that the evaluation index is the highest level, the middle level evaluation index is represented by U_1, and each index element is represented by U_{1n}, and so on.

In the study, the hierarchical relationship of evaluation indicators is expressed by set, which is expressed as:

$$U = (U_1, \cdots, U_m). U_i = (U_{i1}, \cdots, U_{im}). \tag{19}$$

In the analytic hierarchy process, the weight of indicators is bound to be different. The weight is generally used to reflect the importance of these indicators. Assuming that different primary measurement weight indicators have been determined to be greater than 0, the weight vector used to represent u and secondary indicators will have their own weight coefficients. Expressed as a, and the weight vector is also greater than zero. In the personnel training organized by the Ministry of Education, the evaluation grades are different. In the research and analysis of this paper, five grades are used. From excellent to failed, grades need to be assigned and divided, and the 5-point assignment method is adopted for the five grades.

The evaluators are assumed by relevant experts. Assuming that there are p evaluators, each evaluator will fill in the

Table 6: Weight vector of grey evaluation.

Index	4.5	4.5	5	5	4.5	Weight
Preclass preparation	$f_1(4.5)$	$f_1(4.5)$	$f_1(5)$	$f_1(5)$	$f_1(4.5)$	0.1289
Teaching task	$f_2(4.5)$	$f_2(4.5)$	$f_2(5)$	$f_2(5)$	$f_2(4.5)$	0.4970
Teaching contents	$f_3(4.5)$	$f_3(4.5)$	$f_3(5)$	$f_3(5)$	$f_3(4.5)$	0.1813
Teaching key points	$f_4(4.5)$	$f_4(4.5)$	$f_4(5)$	$f_4(5)$	$f_4(4.5)$	0.1928

score table. Assuming that the sample matrix is represented by D, D is the element in the matrix, Table 3 is the sample matrix, and D in the table represents the score of the evaluation index.

To determine the evaluation distribution is to determine the grade. It is assumed that the evaluation classification is represented by C, the corresponding whitening weight function is represented by F, and the threshold value is represented by λ express. The whitening weight function is determined according to the score and evaluation level. According to the content of evaluation activities, take the average value of the score given by each evaluation index as the index score. All evaluators believe that u belongs to C to a greater extent. At this time, the grey evaluation weight of index u belongs to grey category is expressed by R, and the formula is as follows:

$$r_{ifl} = \frac{\sum_{k=1}^{p} f_l(d_{ijk})}{\sum_{l=1}^{E}\sum_{k=1}^{p} f_l(d_{ijk})}. \tag{20}$$

The vector r is determined according to the grey evaluation weight in the grey category. r reflects the grey evaluation vector, and the formula is expressed as:

$$r_{ij} = (r_{ij1}, r_{ij2}, \cdots, r_{ijg}), \tag{21}$$

where $j = 1, 2, \cdots, N$ and $I = 1, 2, \cdots, M$. Table 4 is the table operation method for calculating the grey evaluation weight vector. The data in the first row of the table reflects the evaluation vector.

Comprehensively evaluate each index, and use u to represent these indexes. Comprehensively evaluate u, where the comprehensive evaluation weight vector is represented by B, and the calculation formula is expressed as follows:

$$B_i = A_i \cdot R_i. \tag{22}$$

The grey comprehensive evaluation weight vector B reflects the degree to which the evaluated person belongs to each evaluation grey class, and the grey class grade of the evaluated person is determined according to the maximum weight principle. The judgment made according to this principle has certain defects in theory. This result may not be effective, and the weight vector of grey comprehensive evaluation needs to be further processed. The grey comprehensive evaluation value is expressed by W, and the formula is:

$$W = B(\lambda_1, \lambda_2, \wedge, \lambda_g)^T \tag{23}$$

4.2. Data Sorting. The data is expressed as the evaluation and measurement system of physical education teaching effect. The MATLAB software is used in teaching evaluation. In order to ensure the authenticity of the original data, the survey method is used to obtain expert data, and the questionnaire method is widely used (see Table 5).

Each secondary index is divided into different tertiary indexes. Teaching preparation, teaching organization, sports load, and teaching effect are divided into four tertiary indexes, and teaching characteristics have three tertiary indexes. This index system can comprehensively reflect the factors of classroom teaching quality. In data processing, the weighted score may affect the evaluation conclusion.

The evaluation is divided into excellent 5 points, good 4 points, qualified 3 points, basically qualified 2 points, and unqualified 1 point. The corresponding gray whitening weight functions are expressed by F, and the function can be expressed as:

$$\begin{aligned}
f_1(x) &= \begin{cases} x/5, 0 < x < 5 \\ 1, x > 5 \end{cases}, \\
f_2(x) &= \begin{cases} x/4, 0 < x < 4 \\ 5 - x, 4 < x < 5 \end{cases}, \\
f_3(x) &= \begin{cases} x/3, 0 < x < 3 \\ (5 - x)/2, 3 < x < 5 \end{cases}, \\
f_1(x) &= \begin{cases} x/2, 0 < x < 2 \\ (5 - x)/3, 2 < x < 5 \end{cases}, \\
f_1(x) &= \begin{cases} 1, 0 < x < 1 \\ (5 - x)/4, 1 < x < 5 \end{cases}.
\end{aligned} \tag{24}$$

According to the measured data, the grey evaluation of different indexes can be obtained. At the same time, different methods were used to determine other indexes. Finally, the evaluation results are obtained (see Table 6).

$$R = [B_1, B_2, B_3, B_4]. \tag{25}$$

This method can also evaluate and rank the teaching of multiple teachers. Taking the classroom teaching evaluation of public physical education as an example, the same method is used to evaluate, and three teachers are randomly selected. Establish an evaluation set, assign values to different levels, and determine the weight of indicators according to these assigned scores. In the determination of index weight, experts are selected to determine the basic score. Combined with the previous analysis, the improved 3-scale method is used to establish the judgment matrix, and then, the weight index of each factor is obtained. The maximum characteristic root is brought into the characteristic equation to obtain the homogeneous linear equation. Through the consistency test, $Cr < 0.1$. Using the weighted average comprehensive evaluation model, the fuzzy matrix is obtained. Calculate the grey correlation degree and bring it into the algebraic formula to obtain the correlation degree. The evaluation results are consistent with the daily teaching evaluation, which shows that the grey system theory is effective and can avoid the disadvantages of maximum membership evaluation. Compared with traditional methods, it can comprehensively consider the impact of each sample data on the final results to the greatest extent, which is closer to the actual evaluation results than the theoretical fuzzy evaluation.

5. Conclusion

Since its inception, grey system theory has been widely used in the fields of culture, medicine, management, society, and so on. Based on the simple analysis of grey system theory, the weight is determined by analytic hierarchy process, the evaluation model is established, and the evaluation results are comprehensively analyzed by grey system theory. The example analysis shows that the application of grey system theory in teaching effect evaluation is more intuitive, can make full use of the existing whitening information, and reduce human error. Moreover, it can comprehensively consider the impact of each sample data on the final result to the greatest extent, which is closer to the real evaluation result in theory than fuzzy evaluation. The grey system theory system is applied to the ranking optimization of teaching evaluation, which is also an effect that fuzzy comprehensive evaluation can not get. However, there are still some problems in this paper. Any teaching evaluation method has its own shortcomings. For example, when applying the evaluation method of grey system theory, it is necessary to conduct qualitative analysis on the basis of qualitative research and make judgment according to the actual situation.

Data Availability

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

Conflicts of Interest

The author declares that he has no conflicts of interest regarding this work.

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