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Retraction

Retracted: Based on Fuzzy Comprehensive Evaluation, the Online and Offline Hybrid Teaching Mode of Physical Education Courses is Constructed

Security and Communication Networks

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret 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 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] X. Qian and X. Li, "Based on Fuzzy Comprehensive Evaluation, the Online and Offline Hybrid Teaching Mode of Physical Education Courses is Constructed," *Security and Communication Networks*, vol. 2022, Article ID 8571077, 18 pages, 2022.

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Research Article

Based on Fuzzy Comprehensive Evaluation, the Online and Offline Hybrid Teaching Mode of Physical Education Courses is Constructed

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With the continuous development of the times, the educational concept in the information age continues to advance, in order to meet the needs of the society, each school in China has reformed and piloted according to its own situation to improve the quality of teaching. The research of conventional mixed physical education teaching, from the perspective of research methods, can be divided into two orientations: qualitative and quantitative. On the other hand, from the perspective of sample size, traditional research is a small sample study, and these objective behavioral data have opened up a new perspective for the research of blended physical education teaching from the research methods and research content. In this context, this paper combines the fuzzy comprehensive evaluation method to propose fuzzy comprehensive evaluation methods for mixed physical education teaching, such as preclass preparation, in-class links, teaching content, and teaching methods and designs an online and offline hybrid teaching mode for physical education courses based on a fuzzy comprehensive evaluation to construct an evaluation system, determine its fuzzy operators, determine indicators, and evaluate them comprehensively, reasonably and accurately through experiments. The fuzzy comprehensive evaluation method is based on the fuzzy mathematics comprehensive evaluation method, which can evaluate the evaluation object from all aspects, can objectively reflect the essential characteristics of things, and the evaluation process of the mixed mode construction of physical education courses is more scientific and reasonable. The application of the fuzzy comprehensive evaluation method has effectively promoted the reform and improvement of education and provided a foundation for the continuous improvement and innovation of students' learning and teachers' teaching effects.

1. Introduction

In this paper, the construction of online and offline hybrid teaching mode of physical education courses based on fuzzy comprehensive evaluation is carried out, and the construction of online and offline mixed teaching modes of physical education courses is studied and analyzed by using the fuzzy comprehensive evaluation method. The fuzzy comprehensive evaluation method is a comprehensive assessment method and is an evaluation method based on fuzzy mathematics [1]. From the mathematical affiliation of the fuzzy comprehensive evaluation, the fuzzy comprehensive evaluation method transforms the quality assessment into a quantitative assessment; that is, the fuzzy comprehensive evaluation method will be used to make a comprehensive assessment of something or things that are limited by multiple factors. It has clear results, powerful systematicness, and it can better solve the problem that is difficult to quantify blurry problems; can also be used to resolve any uncertain issues. Hesse Biber first proposed the concept of fuzzy sets, on which it developed into fuzzy mathematics [2]. The essence of a fuzzy set is to use a membership function to turn uncertainty into a quantified form because it quantifies uncertainty and then provides a mathematical tool to solve the uncertainty. Over the past 40 years, the fuzzy theory has been widely used in the fields of

integrated assessment and decision-making, data processors, data collection methods, and data collection control [3]. Factors of objects are assessed based on the results of the assessment, and a comprehensive assessment of the objects resulting from a large number of assessments is made [4]. In actual calculations, objects are often uncertain, and uncertainties are the most important, so a vague and comprehensive assessment can be obtained. A comprehensive assessment (FCE) of objects with multiple ambiguity factors is good [5]. In a complex system containing many factors considering the following factors, can be divided into many layers to construct judgment at each level Factors should be divided into assessments The number of assessments at each level is the same The number of evaluations between the grades should have a unique connection with each other, thus facilitating mathematical processing and operation, determining the correspondence of each level, and preserving its vague matrix [6]. The order of evaluation is: the lowest level is first fully assessed, then the lowest level evaluation conclusion constitutes a fuzzy matrix for comprehensive assessment, and the first level will be a fuzzy matrix from bottom to top for a comprehensive evaluation, and the overall comprehensive evaluation conclusion of the system can be received [7]. During 1989, Japan used robotics, process control, iron, traffic management, error diagnosis, medical diagnosis, image processing, market forecasting, and many other fields in fuzzy technology [8]. The use of fuzzy theory and fuzzy algorithms in Japan and its huge market prospects shocked the Western business community and became widely accepted in academia. The steps of the fuzzy composite rating method are usually divided into four steps: constructing a composite rating index, statistical values, and a combination of weights and weight vectors. The construction of a comprehensive assessment index means that a comprehensive evaluation system is the basis for a comprehensive assessment. The appropriateness of the selection of the assessment index directly affects the accuracy of the comprehensive assessment [9]. The establishment of evaluation indexes should incorporate, to a large extent, commercial data on evaluation systems or relevant laws and regulations [10]. Constructing a good weight vector means establishing a good weight vector by a professional empirical method or an AHP analysis method [11]. Creating a fuzzy synthesis evaluation matrix is to establish the appropriate membership function and then start running it. The synthesis of evaluation matrices and weights is synthesized using appropriate synthesis factors and the result vectors are interpreted. Physical education should be a targeted and organized learning process based on the student's participation plan [12]. Physical education classes are co-organized by teachers and students. His mission was to teach students sports knowledge, techniques, and skills, improve physical fitness, and develop ethics, perseverance, and quality [13]. This is the basic form of physical education in schools, one of which includes the possibility of sports development. Physical education, which refers to education through physical activity, is literally translated as physical education in English, abbreviation: physical education. With the strengthening of international exchanges, the degree and level of development of sports have become an important symbol of the development and progress of the country and society, and an important means of diplomatic and cultural exchanges between countries [14]. Sports can be divided into a wide range of sports, competitive sports, school sports, traditional national sports, etc. Including sports culture, physical education, sports competitions, sports installations, sports organization, sports science and technology, sports economics, and other factors [15]. The philosophy of physical education is aimed at teaching students physical education knowledge, techniques, and skills, effectively developing the student's body, improving the student's body, and cultivating their moral will [16]. The idea of physical education should attach great importance to teaching and the education of the people, attach importance to morality, sincerity, encouragement, and friendship; in terms of teaching methods, we should pay attention to individualization and diversity, pay attention to the interaction between teachers and students, and fully consider the creativity of students. It emphasizes patience, diligence, and adapting measures to individual needs. Strengthen students' ability and enthusiasm for participation and give full play to students' creativity. Promote the good psychological quality of students, promote their physical and mental health and coordinate their development. Improving students' ability to adapt to modern society can improve physical health. Through the course, students can improve their understanding of body and health, master physical health knowledge and scientific fitness methods, and improve their awareness of self-care; exercise to improve physical health and promote physical health; develop a healthy lifestyle [17]. By studying this course and improving mental health, students will feel the warmth of the collective and the joy of emotion in a harmonious, equal, and friendly sports environment; in the process of experiencing setbacks and overcoming difficulties, improve the ability to encounter setbacks, adjust emotions, and develop strong willpower; in the process of continuous progress and success, these three concepts enhance self-worth and self-confidence, cultivate innovation and ability, and form a positive, optimistic and happy outlook on life. Blended teaching is an "online" + "offline" model that combines the advantages of online learning with traditional learning. Thanks to the implementation of a new organizational format, students can learn from a deep depth. Online hybrid teaching is a new teaching model that combines information technology with traditional classroom teaching. It means that teachers use modern information technologies such as the internet, mobile devices, and cloud computing to build online education platforms, while students use online web platforms to complete self-directed learning [18]. There are online resources, and those resource structures specified can explain the knowledge. Online resources are the premise of hybrid teaching, because the hybrid teaching we endorse lies in the traditional classroom, through the video promotion to give students enough relearning and each student can have a better knowledge base as possible, to ensure the quality of classes in the classroom. In the classroom, our classes only discuss the key points and difficulties, which are common

problems that students learn online. There are physical activities that test, integrate, and convert online knowledge. As mentioned above, students can basically master these most basic knowledge through online learning. Offline and offline, and after the teacher filled in the gaps, we made a key breakthrough. It is through carefully designed classroom teaching activities to organize students to grasp the basics of online learning and use it flexibly. Interaction between teachers and students is leveraged to achieve more progressive curriculum goals, giving students more opportunities to engage in cognitive learning rather than focusing on students in the classroom as they have in the past. The teacher's teaching process must be tested and evaluated. Online or offline testing based on online learning platforms or other small courses is an important way to measure students' learning perspectives. Getting feedback can help us improve the relevance of our teaching activities, so that students can get clear learning, and teachers can get clear teaching. If we use the results of these quizzes as an important basis for process evaluation, it is true that people should pay attention to both results and results in the learning process. Even we should pay more attention to this process evaluation when the solid process is the most reliable foundation. The exploration of the online and offline hybrid teaching mode of physical education curriculum using fuzzy comprehensive evaluation provides a new research direction for the teaching method in the context of education in the new era.

2. Perception of the Content of the Study

2.1. Traditional Physical Education Teaching Model. Since the reform and opening up, colleges and universities have continuously deepened and promoted educational reform, strengthened the concept of teaching, improved the teaching content, and improved the teaching methods and means, which is a method of retaining traditional education and learning on the basis of other curriculum reform experience to develop modern physical education [19]. Through the investigation, it was found that for a long time, China's reform status has been constantly innovating and changing, and China's education has not changed much in essence, or the practice of teachers lecturing and students doing problems. On the one hand, this teaching mode is conducive to teachers to organize and manage the classroom in a timely manner, to understand and monitor the learning and learning of students in a timely manner, and to make timely adjustments to classroom teaching. On the other hand, it assists in the comprehensive and systematic learning of teachers' knowledge and the development of active skills in the language. However, with the rapid development of information technology, the shortcomings of traditional teaching methods are becoming more and more prominent. In the learning process, middle school students are too dependent on teachers, lack the spirit of learning and exploration, resulting in their gradual loss of self-control, autonomy, and innovation. Continuous improvement of students' learning methods and the rapid development of new media technologies have uncovered various problems in the classroom: low amount of traditional teaching knowledge, single teaching methods, teachers and students can not communicate well, and so on. The interaction between teachers and students and the lack of interest in learning and the development of modern teaching are seriously hindered. Its teaching process is shown in Figure 1.

2.2. Online Online Teaching. The advent of education informatization 2.0, the strengthening of the development of the digital education system, and the cultivation of talents in the modern information society have become an inevitable trends in the development of higher education. In the work of "informatization teaching" carried out in 2017, education stressed that we should vigorously promote the research done by higher education and university networks, and actively support "online and offline" research. It is the promotion of mixed teaching methods in national policies and the continuous development and education of "in the process of education," new modes of teaching, including the extensive provision of "general education," "small education," and "SPOC" in colleges and universities. This new model of teaching will reshape the dynamism of physical education reform [20]. First of all, online teaching uses multimedia technology to make classroom teaching more vivid and intuitive, completely destroying the traditional classroom personal and fixed teaching mode. Second, students can share learning resources over the Internet to get the information they need. The knowledge acquired is no longer limited to textbook knowledge and teacher education, it expands the opportunities for students to acquire knowledge. Ultimately, the online classroom achieves the goal of "one-on-one" learning between teachers and students. Students choose what to learn according to their own abilities and abilities, solve the problem of personal differences, and teach according to the appropriate situation. Online teaching can effectively offset the shortcomings of traditional education and improve teaching efficiency.

2.3. Online and Offline Mixed Teaching. With the continuous advancement of information-based education reform, China's education gap in the new era has transformed into a contradiction between the diverse and individualized needs of individuals and the needs of a unified, highly educated person. Therefore, under the guidance of new teaching objections, strengthening teaching facilities, building high-quality teaching tools, innovating teaching methods and resources, and improving teaching evaluation systems have become the main challenges of the current education reform [21].

With the rapid development of science and technology in China, China officially introduced the "universal space" in 2012. New online education models, such as "silent lessons" and smart courses, have used new blood to teach Chinese learning methods. However, due to the deepening of research on online teaching models, several shortcomings of the new teaching models have been found: for example, online teachers are unable to accurately grasp the learning status and progress of students, nor can they systematically

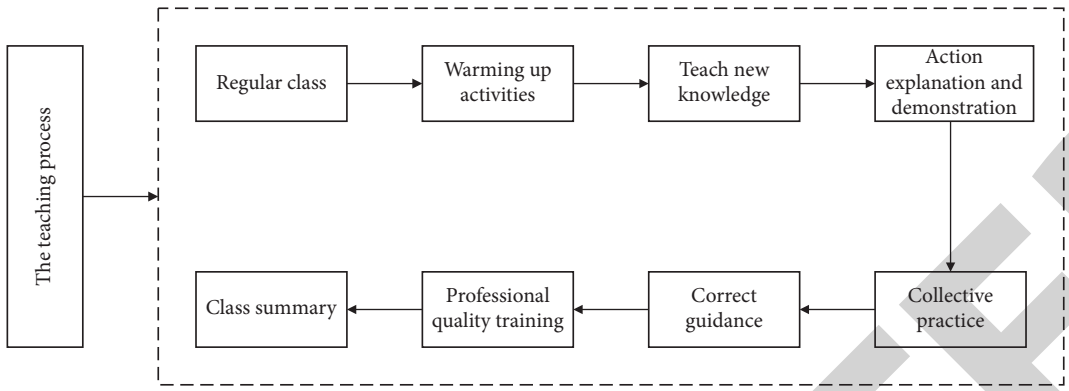

Figure 1: The flow of the traditional physical education teaching model.

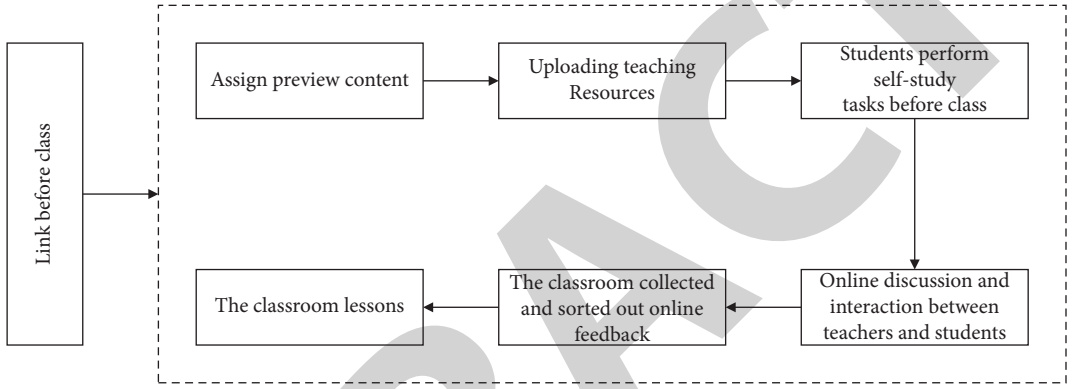

Figure 2: Online and offline mixed teaching preclass process.

and comprehensively evaluate students' learning experiences; The Internet has a rich reserve of information, which is easy to distract students' attention and is not conducive to the concentration of their thinking [22]. Given the challenges of online teaching, researchers began to combine online teaching with traditional teaching and suggested a "hybrid" approach to teaching. On the one hand, to make up for this traditional teaching content, the benefits of online teaching do not belong to the traditional classroom participation method at all, using its advantages to teach students after class, such as video, pictures, and audio introductions, to enhance students' interest in learning; online teaching can stimulate students' enthusiasm for learning, strengthen communication and interaction between teachers and students and create a positive learning atmosphere in the classroom through online response, online debate, class testing, communication, and sharing. On the other hand, students can also organize detailed information on course content by holding hands-on practical courses and collating them to strengthen and improve students' control over course content. Based on the existing research, the mixed teaching explores the improvement of the basic and online and offline mixed teaching suitable for teaching. The reform provides new ideas in the context of creating education in the new era. Its preclass teaching process is shown in Figure 2.

As can be seen in Figure 2, the preparation for online teaching before class is mainly based on the use of documents and sports videos. The teaching materials mainly include five parts of action demonstration and action demonstration; The main elements of the action technique, teaching steps, protective measures, and scoring criteria. The time point of the video is about 3 minutes per episode: the introduction and transmission of the file is mainly to illustrate the theoretical knowledge of motion. The middle of the lesson is shown in Figure 3.

From Figure 3, it can be seen that another major purpose of the course is to explain and correct the problems and doubts of online automatic learning, and to guide students to master and integrate knowledge. Through offline teaching, they can improve the accuracy, consistency, and coordination of technical movements and can also improve the understanding and control of technical movements. The after-school session is shown in Figure 4.

As shown in Figure 4, the after-class link is mainly after class, the teacher provides feedback on the actual learning of the students, and tests the students' theoretical knowledge. Among these students, theoretical knowledge comes mainly in the form of practice questions, which can be asked 5–10 questions at a time, mainly for technical aspects, key points and difficulties, and evaluation criteria for actions.

2.4. Fuzzy Comprehensive Evaluation Method. Fuzzy synthesis evaluation is a comprehensive investigation method based on fuzzy mathematics [23]. According to fuzzy

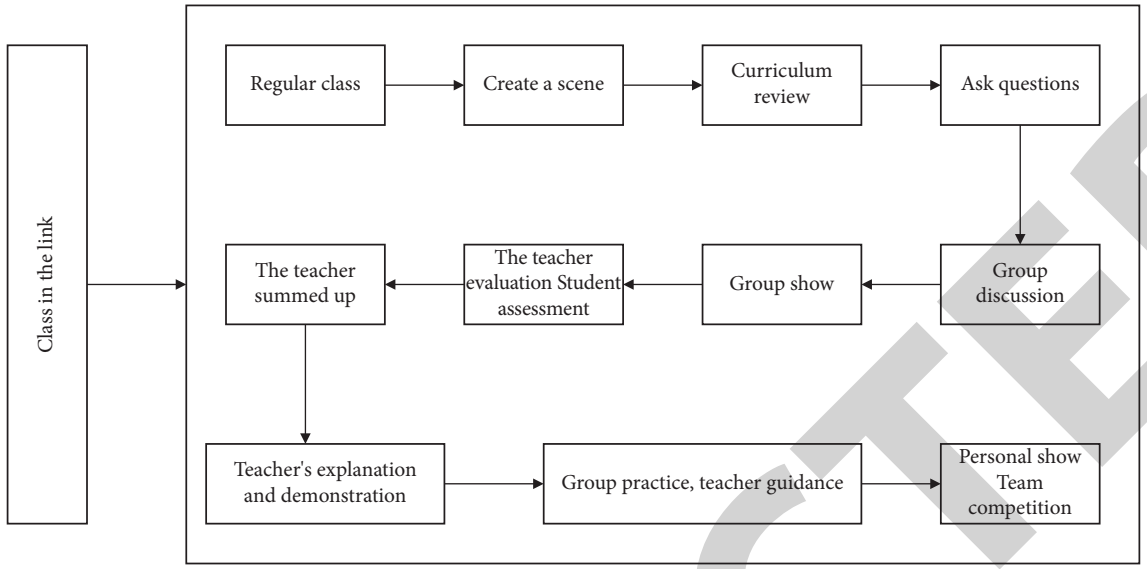

Figure 3: The process of online and offline mixed teaching courses.

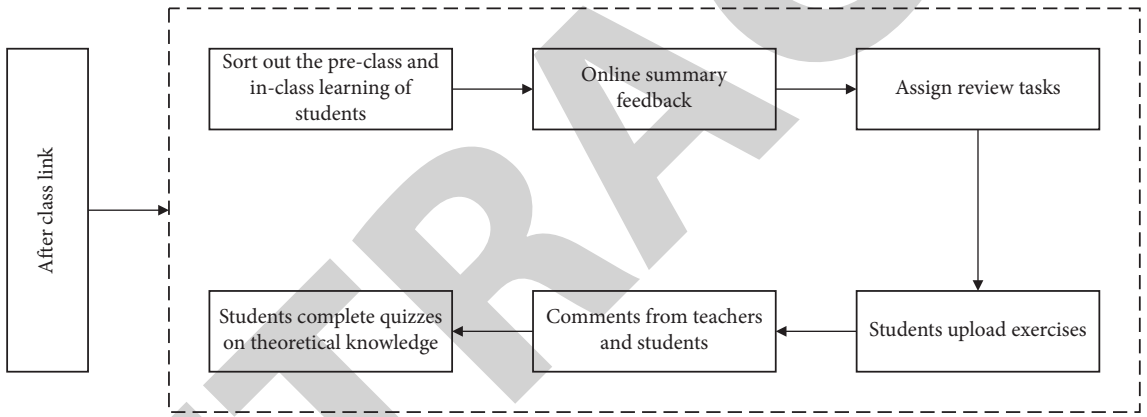

Figure 4: Learning process in the after-school period.

mathematical theory, this method translates into qualitative evaluation, that is, through a comprehensive assessment, fuzzy mathematics makes a comprehensive assessment of something or object that is limited by multiple factors. This approach quantifies certain problems that are uncertain and cannot be quantified. The characteristics of the Fuzzy Comprehensive Evaluation Specification are as follows:

(1) When considering the optimal benchmark rating factor, the evaluation value is 1: the rating value of other suboptimal rating factors is determined according to the benchmark number.

(2) According to the nature of several rating factors, the relationship between the rating value and the rating factor can be determined.

The steps are as follows:

Determine the object factor domain

P evaluation indicators, $u = \{u_1, u_2, LL, u_p\}$

Determine the evaluation hierarchy domain

$$v = \{v_1, v_2, LL, v_p\}, \tag{1}$$

v-hierarchical collection;

Indicates that each level corresponds to a fuzzy subset.

Establish its relationship matrix R

In summary, $u_i\,(i = 1, 2, LL, p)$ quantify the valuation object of each term to get the member rank of the corresponding fuzzy sub-$|u_i$, and then wait until the fuzzy subrelationship matrix:

$$R = \begin{bmatrix} R|u_1 \\ R|u_2 \\ \wedge \\ R|u_p \end{bmatrix} = \begin{bmatrix} r_{11} & r_{12} & \wedge & r_{1m} \\ r_{21} & r_{22} & \wedge & r_{2m} \\ \wedge & \wedge & \wedge & \wedge \\ r_{p1} & r_{p2} & \wedge & r_{pm} \end{bmatrix}_{pxm}, \tag{2}$$

where -represents the element of column j in row i; r_{ij}

Matrix Ru_i indicates that there are weaker member ranks in terms of hierarchy factors. In a given factor, the

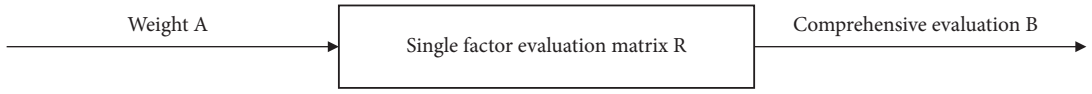

Figure 5: Unipolar fuzzy comprehensive evaluation model.

performance of a computed object itself is analyzed by a fuzzy u_i vector $(R|u_i) = (r_{i1}, r_{i2}, LL, r_{im})$, whereas other calculus methods are shown exponentially. A comprehensive assessment, therefore, requires more information in this regard and can be assessed in many ways.

Determining the right vector

Comprehensive fuzzy analysis yields a weight vector for evaluation factors: the A-value analysis $A = (a_1, a_2, LL, a_p)$ membership is used to determine the order between the evaluation indices, and to determine whether the weight coefficients are unified before synthesis. The formula is as follows:

$$\sum_{i=1}^{P} a_i = 1, \quad a_i \geq 0,\ i = 1, 2, LL, n. \tag{3}$$

Its result vectors

The synthesis of A and R obtains the fuzzy comprehensive evaluation result B, and A must be calculated using a suitable operator, and its formula is as follows:

$$AnR = \left(a_1, a_2, LL, a_p\right) \begin{bmatrix} r_{11}\ r_{12} \wedge r_{1m} \\ r_{21}\ r_{22} \wedge r_{2m} \\ \wedge\ \ \wedge\ \wedge\ \wedge \\ r_{p1}\ r_{p2} \wedge r_{pm} \end{bmatrix} = (b_1, b_2, \wedge b_m) = B, \tag{4}$$

where b_1-It is obtained by the operation of the weight vector (A) and the fuzzy relationship matrix (R) on the j case, indicating the degree of membership of an evaluation object of the whole on the fuzzy subset v_j.

The algorithm in the evaluation process basically contains the evaluation of all the attributes of each object, many evaluation objects reflect various characteristics from all aspects, these characteristics have a certain degree of ambiguity, which means that the fuzzy comprehensive evaluation method of comprehensive evaluation method is scientific and reasonable, and its results are closer to the actual situation, the algorithm basically realizes the fairness and justice of the evaluation.

3. Establishment of a Fuzzy Comprehensive Evaluation Model for Online and Offline Physical Education Courses

3.1. Establishment of Fuzzy Comprehensive Evaluation Model. Let, for the finite domain of theory, $U = \{x_1, x_2, x_3, \wedge, x_n\} V = \{y_1, y_2, K, y_m\} A$ is a fuzzy vector over U, and $R$is a Fuzzy matrix on $U * V$, which is a composite of two Fu AnR zzy matrices. That is, Fuzzy can be seen as a fuzzy machine for dumpsters, which is the Fuzzy dumpster is the fuzzy dumpster concept of A to U, and transforms the Fuzzy dumper to B to the discourse field V. It is precisely through the fuzzy matrix R between U and V that $B = AnR$ the transformation is made. The specific evaluation model is shown in Figure 5.

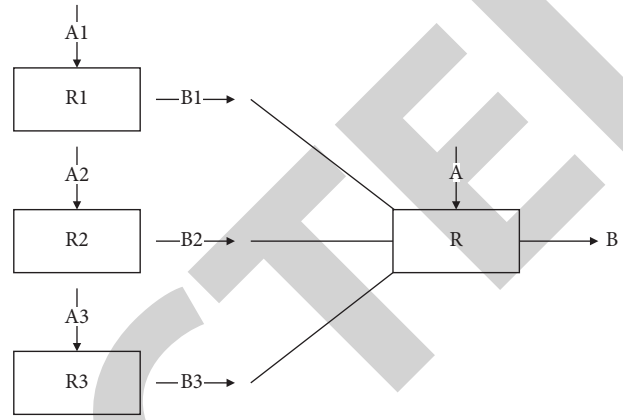

Figure 6: Secondary fuzzy comprehensive judgment model.

In the figure:

B-Fuzzy comprehensive evaluation results;

A-Fuzzy evaluation factor weight set;

R–Represents a fuzzy relationship from U to V.

The secondary fuzzy comprehensive evaluation formula is as follows:

$$B = AnR = An \begin{bmatrix} B_1 \\ B_2 \\ M \\ B_i \end{bmatrix} = An \begin{bmatrix} A_1 nR_1 \\ A_2 nR_2 \\ M \\ A_i nR_i \end{bmatrix} = (b_1, b_2, L, b_m). \tag{5}$$

The model diagram is shown in Figure 6.

3.2. Fuzzy Operators. Earlier in the article, there is a fuzzy relation R from U to V, and a fuzzy map is obtained: it is to assemble the fuzzy comprehensive valuation decision model, where $TR(U, V, R)B = AnR$ is the fuzzy subset of V:

$$b_j = \vee\left(a_k \wedge k_j\right), k = 1, 2, L, n\ j = 1, 2, Lm. \tag{6}$$

The result is a normalized treatment of the result, and the result is, that is, the result is a decision on the case $\sum_{i=1}^{m} b_i \neq 1 b_j = \max\{b_1, b_2, \wedge, b_m\} b_j$. Different decisions are made according to different operational definitions, and the decision model is as follows.

3.2.1. $A(\wedge, \vee)$ Model

$$b_j = \max\left\{\left(a_i \wedge r_{ij}\right), 1 \leq i \leq n\right\},\ j = 1, 2, \wedge, m. \tag{7}$$

Due to the large number of factors in this model, the weighted value of each factor is very small, which will eventually reduce the reliability of the result, that is, the weight coefficient is modified. a_i. The process is as follows:

$$a_i = \frac{na_i}{m\sum_{i=1}^{n} a_i}, i = 1, 2, \wedge, n. \tag{8}$$

Then, the weight coefficients are uniformized. Here, $a_i' = (n/m)a_i$, a_i'-Correction weight coefficient; n-the number of evaluation factors; m-The number of factors in the evaluation set.

3.2.2. Model $M(n, \vee)$. There are two modes for operations: one is expressed by the regular multiplication "n," and the other is just the large operation V expression:

$$b_j = \max\left\{\left(a_i n r_{ij}\right), 1 \le i \le n\right\}, j = 1, 2, \wedge, m. \tag{9}$$

Multiplication in the above equation does not lose information, and vice versa. If $a_i n r_{ij}$, less than 1, i.e., if multiple factors are considered, the corrected value correlates with the primary factor $a_i r_{ij}(\,)a_i$ and ignores the secondary factor, which better reflects the importance of univariate assessment.

3.2.3. Model $M(n, +)$. At this time,

$$b_j = \sum_{i=1}^{n} a_i n r_{ij} n j = 1, 2, \wedge, m, \sum_{i=1}^{n} a_i = 1. \tag{10}$$

Model III applies to the effect of multiple factors on the evaluation object, fully considers the impact of the factors involved, and retains all information about the individual factors, and there is no upper limit for the calculation of neutrality, but it must be equal to 1. $a_i r_{ij}(i = 1, 2, \wedge, n\, j = 1, 2, \wedge, m)a_i$.

3.2.4. Model $M(n, n)$. The calculations under this model are b_j

$$b_j = \sum_{i=1}^{n} a_i n r_{ij}, j = 1, 2, \wedge, m \text{或} b_j = \min 1, \left[\sum_{i=1}^{n} a_i n r_{ij}\right], \quad j = 1, 2, \wedge, m. \tag{11}$$

3.2.5. $M(\wedge, n)$ Model. Model five represents a summation operation with an upper limit of 1, using small operations and cyclic operations n, and its expression is, then, $xny = \min\{1, x + y\} b_j = \sum_{i=1}^{n} a_i \wedge r_{ij}$ obtain:

$$b_j = \min\left[1, \sum_{i=1}^{n} a_i \wedge r_{ij}\right], j = 1, 2, \wedge, m. \tag{12}$$

3.2.6. $M(\wedge, n)$ Model. At this time,

$$b_j = n_n^{i=1}\left(r_{ij}^{a_i}\right), j = 1, 2, L, m. \tag{13}$$

Because each operator has a different operating principle, different evaluation results are produced. According to the relevant data, there are many operators in model three, and a variety of factors can be considered. All this operator is used. $M(n, +)$.

3.3. Indicator Processing. After obtaining the indicators from the previous analysis, the target specific results of the rating can be carried out using the maximum membership method, the weighting method, and the fuzzy distribution method. $b_j(1, 2, \ldots, m)$.

3.3.1. Maximum Membership Method. Take the (optional element) corresponding to the (maximum evaluation index) as the evaluation result, that is, $\max b_j V_L$

$$V = \left(V_L \mid V_L \longrightarrow \max b_j\right). \tag{14}$$

The disadvantage of the maximum membership method is that it only takes into account the role of the largest evaluation index and excludes other directory information [24]. If there are more maximum rating indices, it is difficult to judge the evaluation results using the maximum degree of membership method. To solve this problem, we can consider changing the grey association theory. The theory is as follows:

$$\eta_{ij}(k) = \frac{\min \Delta_i(k) + \rho_{\max}\Delta_i(k)}{\Delta_i(k) + \rho_{\max}\Delta_i(k)} \quad \rho \in (0, 1),$$
$$\Delta_{ij}(k) = \left|A_j'(k) - A_i'(k)\right|, \tag{15}$$
$$\eta_{ij} = \frac{1}{k}\sum_{1}^{k} \eta_{ij}(k).$$

where A_j'- the initial value of A; A_i', ρ-is the resolution coefficient; η_{ij}-Relevance.

3.3.2. Weighted Average Method. For weights, the weighted average of each (alternative element) is the evaluation result. Rule: $b_j v_j$

$$V = \frac{\sum_{j=1}^{n} b_j v_j}{\sum_{j=1}^{n} b_j}. \tag{16}$$

If so. $b_j = 1V = \sum_{j=1}^{n} b_j v_j$

If the object of evaluation is a quantitative quantity, the values calculated according to the above two methods are the results of the comprehensive assessment of the fuzzy comprehensive evaluation. If the rating object is a non-quantitative quantity, the maximum subordinate method is used instead of the weighted average method.

3.3.3. Fuzzy Distribution Method. The method directly takes the evaluation index as the evaluation result or 1 and then uses the standard evaluation index as the evaluation result. The specific method of attribution to 1 is as follows.

Sum of the evaluation indicators:

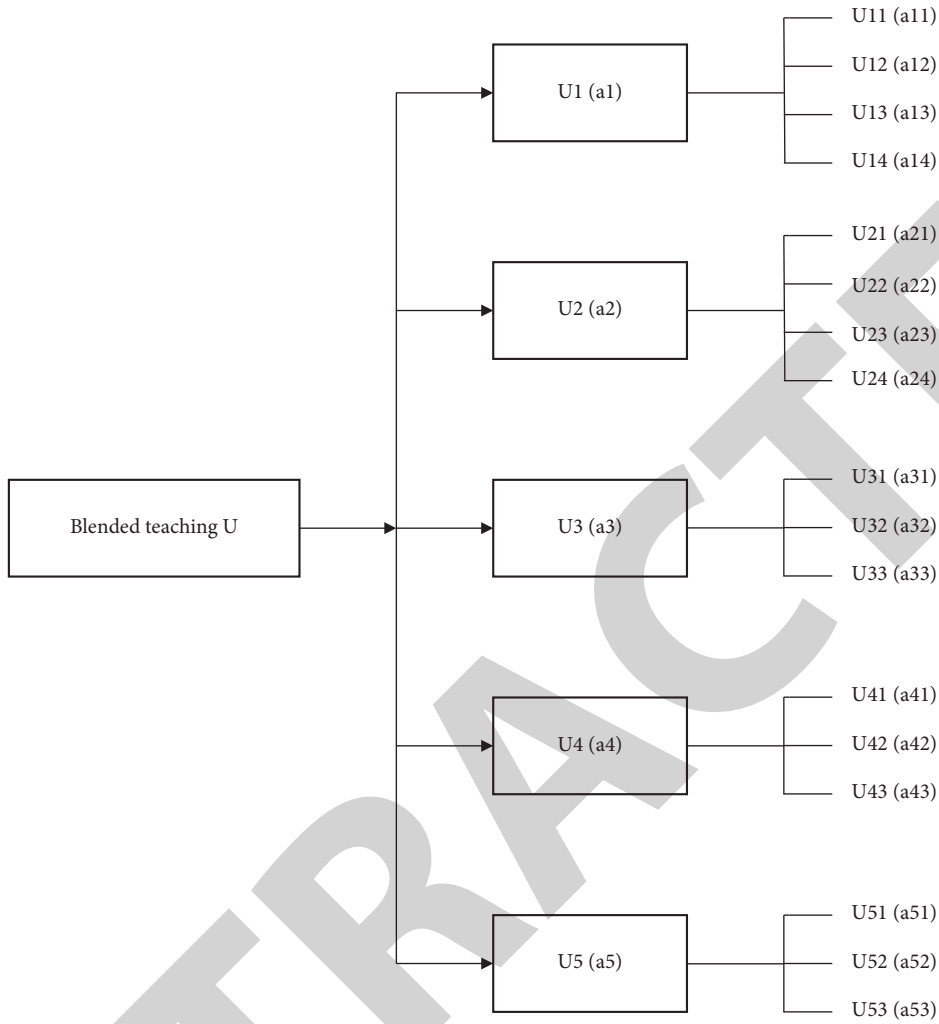

Figure 7: Simplifies the structure of the mixed teaching evaluation index system.

$$b = b_1 + b_2 + \wedge + b_m = \sum_{j=1}^{m} b_j. \tag{17}$$

Divide the original evaluation indicators by the sum of the evaluation indicators:

$$B' = \left(\frac{b_1}{b}, \frac{b_2}{b}, \wedge, \frac{b_m}{b}\right) = (b_1', b_2', \wedge, b_m'), \tag{18}$$

where B' - Normalized fuzzy comprehensive evaluation set; $b_j'(1, 2, \wedge, m)$-Indicates a standardized fuzzy comprehensive evaluation index.

To sum up. $\sum_{j=1}^{m} b_j' = 1$

3.4. Establishment of an Online and Offline Hybrid Teaching Model for Physical Education Courses with Fuzzy Comprehensive Evaluation

3.4.1. Establishment of a Factor Set. The set of factors consisting of the individual factors of the evaluation object is called the factor set (U), i.e., It represents the various factors. They have a certain ambiguity. $U = \{U_1, U_2, U_3, \wedge, U_n\}(U_1, U_2, \cdots, U_n)$

There are five first-level evaluation indexes in Figure 7, which are represented by $U = \{U_1, U_2, U_3, U_4, U_5\}$. Among them, mixed teaching preparation, teaching, explaining knowledge, teaching methods, and students' acceptance of knowledge are represented by U_1, U_2, U_3, U_4, and U_5, respectively. There are multiple secondary indicators for each first-level indicator, such as "sports demonstration and action demonstration;" "main points of sports dynamic technology;" "teaching steps;" "protective measures" under the (mixed teaching preparation) as the second-level evaluation indicators, which are expressed. The same can be obtained U_2, U_3, U_4, U_5 as shown in Figure There are a total of 17 evaluation points, which are weighted $U = \{U_1, U_2, U_3, U_4, U_5\}$ $U_1U_2U_3U_4U_5U_1U_1 = \{U_{11}, U_{12}, U_{13}, U_{14}\}U_2U_3U_4U_5(a_i)$.

3.4.2. Establishment of a Set of Weights. Since the evaluation results are affected by each evaluation factor, in order to optimize this problem, each influencing factor is given a

corresponding appropriate weight value according to its degree of influence $u_i\,(i = 1, 2, \wedge, n) a_i\,(i = 1, 2, \wedge, n)$. That is, the set it consists of is called a set of weights. In general, the individual weights satisfy normalization and non-negativity, as follows: $A = \{a_1, a_2, \wedge, a_m\}$

$$\sum_{i=1}^{n} a_i = 1, \quad a \geq 0 \ (i = 1, 2, 3, \wedge, n). \tag{19}$$

It can be seen as the degree to which the results of the membership evaluation correspond to the factors $u_i\,(i = 1, 2, \wedge, n)$, and the weight set can also be attributed to the fuzzy subparts within the factor set. Weights are usually determined by the rating staff as the actual situation requires. For the same influencing factors, different weights will obviously lead to different evaluation results, and for indicators that use more education, require more, and directly affect the quality, a higher value should be allocated when determining weight; instead, a lower value should be allocated. Thus, it represents the holistic orientation of blended teaching.

3.4.3. Establishment of Evaluation Sets. The evaluation set refers to the collection of various evaluation results made by the evaluator to the evaluation object. Each element conveys a different possible outcome fuzzy synthesis evaluation whose primary purpose is to select the best outcome based on all influencing factors [25].

3.4.4. Determining the Fuzzy Judgment Matrix. A fuzzy comprehensive evaluation is the final result of the most scientific and rational assessment of the influencing factors of the evaluation object, which is thoughtful, meticulous, and the result is close to reality. It is based on a factor to set up a rating object, which can (U_I) evaluate the first item, the degree of affiliation () and the item element in the factor on the number of factors; It is easy to get a chapter count according to the rules of operation $ir_{ij}j(V_j)$ of the first factor $R_i\,(R_i = r_{i1}, r_{i2}, \wedge, r_{im})$.

Similarly, the influencing factors corresponding to each factor in the fuzzy comprehensive evaluation are as follows:

$$\begin{aligned} R_1 &= (r_{11}, r_{12}, \wedge, r_{1m}), \\ R_2 &= (r_{21}, r_{22}, \wedge, r_{2m}), \\ &\wedge, \\ R_n &= (r_{n1}, r_{n2}, \wedge, r_{nm}). \end{aligned} \tag{20}$$

The rate of rating by each factor represents the first single-factor rating matrix R:

$$R_i = \begin{bmatrix} r_{i11} & r_{i12} & \wedge & r_{i1m} \\ r_{i21} & r_{i22} & \wedge & r_{i2m} \\ M & M & M & M \\ r_{in1} & r_{in2} & \wedge & r_{inm} \end{bmatrix}. \tag{21}$$

A more comprehensive assessment can only be achieved through a comprehensive assessment of all influencing factors. The weight set a can be n columns in the fuzzy matrix, and the fuzzy comprehensive evaluation is obtained by combining the weight set with the one-factor fuzzy evaluation matrix B_i.

$$B_i = A_i n R_i = (a_1, a_2, \wedge, a_m) n \begin{bmatrix} r_{i11} & r_{i12} & \wedge & r_{i1m} \\ r_{i21} & r_{i22} & \wedge & r_{i2m} \\ M & M & M & M \\ r_{in1} & r_{in2} & \wedge & r_{inm} \end{bmatrix}, \tag{22}$$

$b_j\,(j = 1, 2, \wedge, m)$ is the fuzzy index. This is the fuzzy evaluation membership of the two-step assessment corresponding to the level of the substitution index that fully meets the influence of all factors, and the first-level evaluation matrix of the fuzzy comprehensive evaluation can be obtained.

$$R = \begin{bmatrix} B_1 \\ B_2 \\ M \\ B_m \end{bmatrix}. \tag{23}$$

Obtained (first-level fuzzy comprehensive evaluation set) $B = AnRs$.

3.4.5. Overall Evaluation Score

$$M = BnV^T = (b_1, b_2, \wedge, b_m) n \begin{bmatrix} V_1 \\ V_2 \\ M \\ V_m \end{bmatrix}, \tag{24}$$

where M-Quantitative score of the comprehensive evaluation; B-Fuzzy comprehensive evaluation results; V-The specific score of the evaluation level.

4. Case Studies

4.1. Study Design. The experiment set up a fuzzy comprehensive evaluation of the physical education course online and offline mixed mode teaching as the experimental group (30 people), on the contrary, in the conventional group (30 people), a total of 120 questionnaires were collected, a total of 60 pre-experimental groups and conventional groups, and a total of 60 experimental groups and conventional groups after the experiment. Their sports theoretical knowledge, sports technical ability, physical education teaching effect, and feedback results were tested and analyzed. In order to ensure that the basic conditions of the experimental group and the conventional group are equal, the basic conditions are shown in Tables 1 and 2.

Through the analysis of Tables 1 and 2, it can be concluded that the experimental group and the conventional group conducting the experiment are greater than 0.05 in terms of a physical fitness test and exercise attitude, and all selected students provide reliability for the experiment and ensure the continuation of the experiment.

Table 1: Comparative analysis table of physical fitness level premeasurement in the experimental group and conventional group.

Test	Constituencies	Number	mean ± s	P
Physical test scores	Experimental group	30	60.55 ± 6.14	0.83
	General groups	30	60.85 ± 4.85	
BMI	Experimental group	30	21.68 ± 2.99	0.50
	General groups	30	21.66 ± 1.68	
Vital capacity	Experimental group	30	3875.00 ± 499.06	0.55
	General groups	30	3796.12 ± 614.53	
Stand up for the long jump	Experimental group	30	2.05 ± 0.30	0.35
	General groups	30	1.98 ± 0.12	
Seated body flexed forward	Experimental group	30	12.76 ± 7.89	0.72
	General groups	30	13.54 ± 6.23	
50 m run	Experimental group	30	8.31 ± 0.79	0.45
	General groups	30	8.21 ± 0.86	
1000 m run	Experimental group	30	3.67 ± 0.22	0.56
	General groups	30	3.79 ± 0.33	
800 m (female) run	Experimental group	10	4.25 ± 0.20	0.22
	General groups	10	4.12 ± 0.10	
Pull-up	Experimental group	30	7.60 ± 2.30	0.51
	General groups	30	7.12 ± 3.05	
Sit-up	Experimental group	10	43.00 ± 3.99	0.19
	General groups	10	42.54 ± 3.10	

Table 2: Comparative analysis of exercise attitudes in the experimental group and the regular group.

Test	Constituencies	Number	()mean ± s	P
Behavioral attitudes	Experimental group	30	30.555.65±	0.61
	General groups	30	27.576.99±	
Goal attitude	Experimental group	30	46.557.26±	0.17
	General groups	30	44.667.32±	
Behavioral cognition	Experimental group	30	28.408.10±	0.68
	General groups	30	29.664.60±	
Behavioral habits	Experimental group	30	37.2611.20±	0.31
	General groups	30	39.517.82±	
Behavioral intent	Experimental group	30	28.958.47±	0.67
	General groups	30	30.716.50±	
Emotional experience	Experimental group	30	38.0111.22±	0.60
	General groups	30	40.517.25±	
Sense of behavioral control	Experimental group	30	24.113.33±	0.62
	General groups	30	24.544.08±	
Subjective criteria	Experimental group	30	21.127.85±	0.22
	General groups	30	22.566.90±	
Exercise attitude overall score	Experimental group	30	254.9849.11±	0.12
	General groups	30	260.1033.14±	

4.2. Data Processing and Analysis

4.2.1. Knowledge of Sports Theory. In order to understand the mastery of the basic theoretical knowledge of the students learned by the conventional teaching mode and the mixed teaching mode, the conventional teaching mode is set as the conventional group and the mixed teaching mode is the experimental group. The basic theoretical knowledge of these two groups is tested uniformly, and the test results are shown in Figure 8.

From Figure 8, it can be seen that the number of people in the experimental group with excellent test scores is more than the number of people in the regular group, with 13 people with scores distributed between 90 and 100 points, and 7 people with scores between 80 and 89, and the number of people in the regular group is more in the low segment. There are only 7 people with a score of 80 to 100.

As can be seen from Table 3, the average score of the experimental group was 8 4.21, fluctuating between the values of 10.38, while the average score of the regular group was 71.48 In the fluctuation between the 8.30 values, the experimental group, and the conventional group were tested independently in the sample (T), the result (P), the average score of the experimental group was obviously higher than

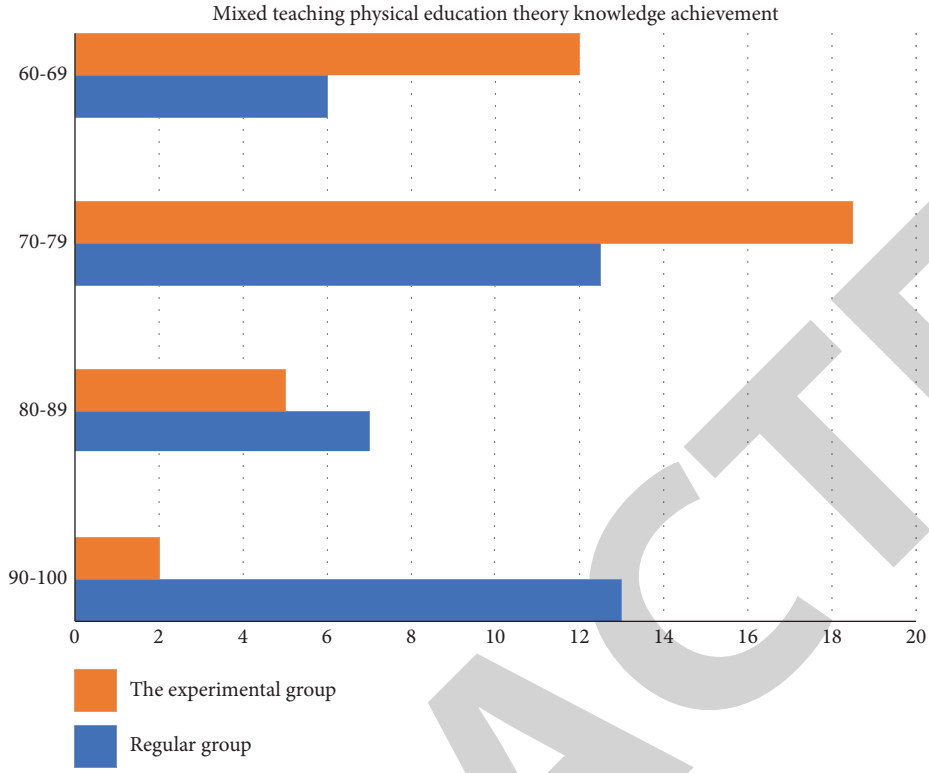

Figure 8: Comparison of sports theory knowledge scores in the experimental group and the conventional group.

Table 3: Comparison of theoretical knowledge scores between experimental groups and regular groups.

Test the content	Experimental group	General groups	T	P
Athletic theory achievements	84.21 ± 10.38	71.48 ± 8.30	4.87	<0.01

that of the conventional group, and there was a large difference between the two groups, that is, the fuzzy comprehensive average of the online and offline mixed teaching of physical education courses had a greater role in promoting students' mastery of sports theory knowledge $P < 0.01$.

4.2.2. Sports Technical Ability. The regular and experimental groups of students were tested with standing jumps and skills, and the number of students in different score segments was sorted as shown in Figure 9.

It can be seen that the experimental group and the regular group had a majority of sports skills tests between 70–89, and the experimental group had as many as 27 people, accounting for 72.8% of the total number, while the regular group had 25 people in this range. The experimental and regular groups improved their performance in the physical skills test compared with before, with 8 people in the experimental group and 7 people accounting for 21.5% of the total number of people and 7 people accounting for 19.4% of the total number of people, respectively.

As can be obtained from Table 4, the average scores of the two sports skills tests of the experimental group, the standing long jump, and skill were 79.82 and 82.32 points, respectively, and the standard deviation was 0.23 and 0.31. The two scores in the regular group were 77.93 points, 80.81 points, 0.31 points, and 0.15 points, respectively. Their independent sample T tested the P-values of 0.504 and 0.355, respectively, that is, whether it was the long jump or skill, the performance of the students in the two groups was significantly different $(P > 0.05)$,

4.2.3. Effect of Physical Education Teaching. In the process of teaching, student interest has become an important indicator of testing the effectiveness of teaching. After the experiment, a questionnaire was submitted to the experimental and regular groups to study learning interest, self-directed learning ability, and investigation cooperation ability. The questionnaire was distributed and collected in the form of an electronic questionnaire that collected the results of the survey in real time, and the results of the questionnaire were compared with the changes in the interest of physical education students after the experiment ended. The result is as follows.

After sorting out the questionnaire, the data in Table 5 can be seen that the experimental group is very different from the regular group, and the reason is that the teacher will send the courseware to the online learning platform for students to learn before the class, and the students will prepare according to the requirements. In this regard,

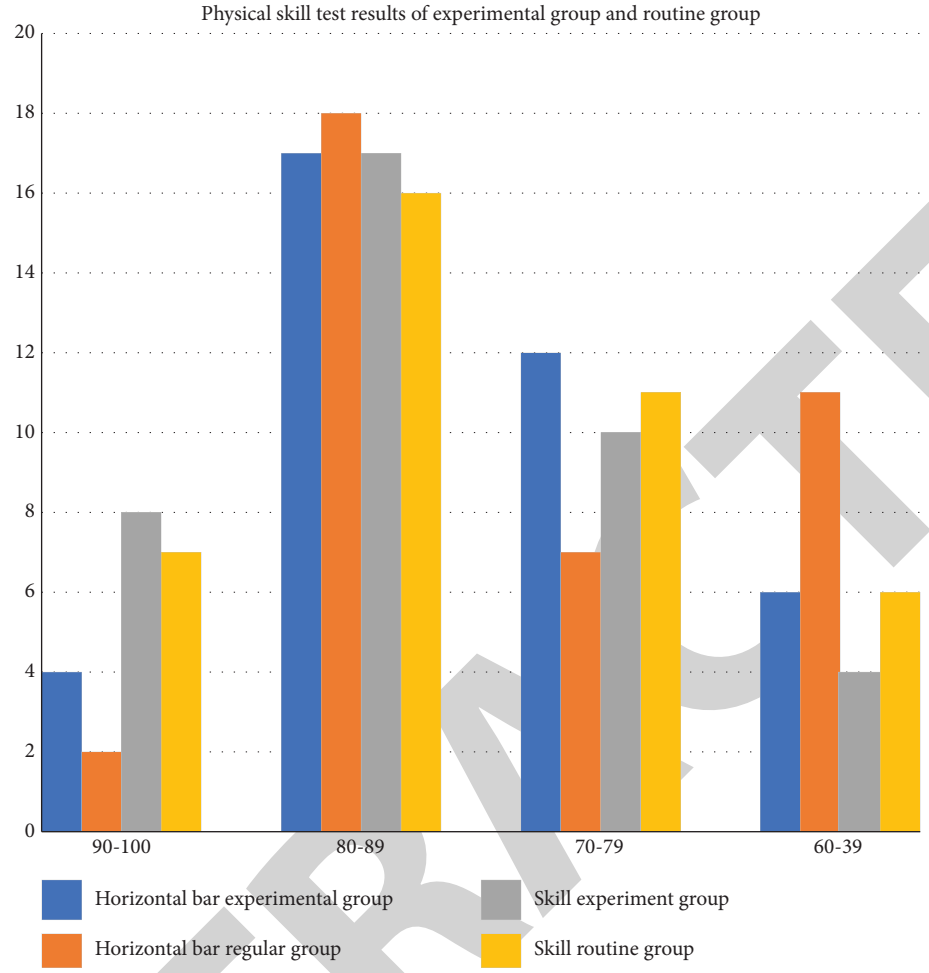

Figure 9: Comparison of athletic skills test scores in experimental and regular groups.

Table 4: Comparative analysis of sports skills results in experimental and regular groups.

Project	Constituencies	Test scores	Highest score	Lowest score	T	P
Stand up for the long jump	Experimental group	79.82 ± 0.23	100	60	0.848	0.504
	General groups	77.93 ± 0.22	90	60		
Skill	Experimental group	82.32 ± 0.31	100	65	0.959	0.355
	General groups	80.81 ± 0.15	96	60		

students can not only complete the homework requirements assigned by the teacher but also improve their independent learning ability. The learning effect of the experimental group and the conventional group was sorted out and analyzed to obtain Table 6, and Figure 10 was obtained according to Table 6, and the results showed that the experimental group had a higher teaching effect than the conventional group.

As can be seen from Table 6, the results of the T test for the independent sample can be concluded, and the test results of the experimental group in all aspects are higher than those of the conventional group. This shows that there are significant differences between the two sets of experiments $P < 0.05$.

Combined with Table 6 and Figure 10, it can be seen that through the results of the mixed teaching of online and offline mixed teaching of physical education courses with fuzzy comprehensive evaluation, students have been improved in all aspects and are more likely to absorb teaching knowledge.

4.2.4. Mixed Physical Education Feedback Results. Through experiments, the effect of mixed-mode physical education in the teaching process was investigated, and the feedback on the effect of mixed-mode physical education was investigated by a questionnaire method to investigate the satisfaction with mixed-mode physical education, and the specific survey results are shown in Figure 11.

As shown in Figure 11, 52% are very satisfied with the mixed teaching model; 42.42% are satisfied, while only six percent of the students show a general attitude, which shows

Table 5: Questionnaire on the effect of physical education after experiments in experimental groups and conventional groups.

		Exactly (%)	Basically compliant (%)	Generally compliant (%)	Essential not compliant (%)	Completely not compliant (%)
Question 1	Experimental group	37.5	40.8	22.2	0	0
	General groups	26.2	20.4	50.1	2.8	0
Question 2	Experimental group	48.9	37.8	13.1	0	0
	General groups	26.5	36.6	31.8	2.7	0
Question 3	Experimental group	55.6	38.9	6.2	0	0
	General groups	40.5	36.3	17.5	1.3	0
Question 4	Experimental group	54.0	37.8	4.6	0	0
	General groups	30.0	39.3	17.5	2.8	0
Question 5	Experimental group	29.4	41.2	6.2	0	0
	General groups	23.6	49.5	23.3	0	0
Question 6	Experimental group	56.5	38.1	7.8	0	0
	General groups	44.8	31.8	20.5	1.4	0
Question 7	Experimental group	69.1	39.7	7.5	0	0
	General groups	59.2	32.4	28.2	1.4	0

Table 6: Comparative analysis of learning effects between experimental groups and regular groups.

	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7
Experimental group $\overline{x} \pm s$	4.25 ± 0.74	4.37 ± 0.70	4.52 ± 0.58	4.48 ± 0.61	4.48 ± 0.63	4.52 ± 0.65	4.36 ± 0.63
General groups $\overline{x} \pm s$	3.82 ± 0.87	4.06 ± 0.83	4.27 ± 0.76	4.26 ± 0.67	4.18 ± 0.83	4.32 ± 0.79	4.01 ± 0.424
T	2.412	2.337	2.078	2.195	2.359	1.605	2.130
P	0.016	0.022	0.030	0.028	0.017	0.108	0.034

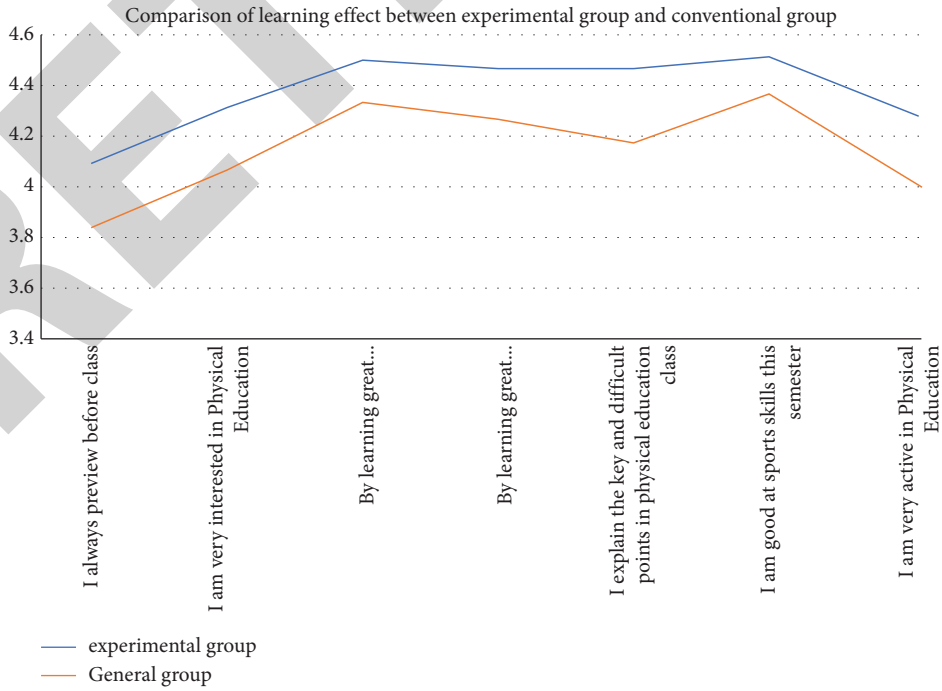

Figure 10: Comparison of learning effects between experimental group and regular group.

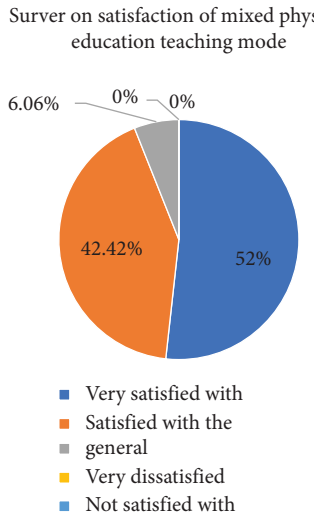

Figure 11: Satisfaction survey of mixed physical education teaching models.

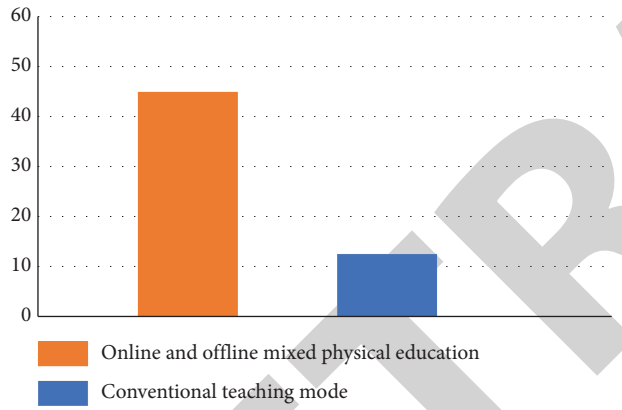

Figure 12: Comparison of students' attitudes towards mixed physical education and regular physical education.

that the mixed mode of physical education is deeply loved and approved by students, and this mode of teaching breaks the problem that conventional teaching is subject to the venue and cannot be guided in time. It can help students better learn relevant knowledge and skills so that students' grades can be improved. In this way, it will improve students' interest in learning and promote the development of mixed-mode physical education. A questionnaire survey was conducted on the question "Mixed-mode physical education and conventional teaching, which kind of teaching is preferred" and a total of 60 people were selected, of which 80% of the students chose mixed mode teaching, and only 20% chose conventional teaching as shown in Figure 12.

It can be seen that mixed teaching is more helpful for students' learning, enabling students to better learn knowledge and skills, break the conventional teaching thinking, and site restrictions, no longer let students be forced to learn, but to guide students, thereby improving students' learning effect and improving the quality of teachers' teaching.

4.3. Calculation of Data Results

(1) Using the evaluation index system represented in the figure in Section 3.4, the weight of each evaluation index is determined according to the needs, and the online and offline mixed teaching of physical education based on fuzzy comprehensive evaluation is set as E, and vice versa as H.

The weights are shown in Table 7.

4.3.1. Comprehensive Evaluation of First-Level Indicators. If $R_{11} = \{0.4, 0.5, 0.1, 0, 0\}$, the $R_{11} = \{0.4, 0.5, 0.1, 0, 0\}R_{12} = \{0.3, 0.3, 0.3, 0.1, 0\}R_{13} = \{0.4, 0.2, 0.3, 0.1, 0\}R_{14} = \{0.4, 0.4, 0.2, 0, 0\}U_{ij}$ fuzzy matrix between the first-level evaluation index and the evaluation level V is

$$R_1 = \begin{bmatrix} 0.4 & 0.5 & 0.1 & 0 & 0 \\ 0.3 & 0.3 & 0.3 & 0.1 & 0 \\ 0.4 & 0.2 & 0.3 & 0.1 & 0 \\ 0.4 & 0.4 & 0.2 & 0 & 0 \end{bmatrix}. \tag{25}$$

4.3.2. Comprehensive Evaluation of Secondary Indicators. According to Table 7, the secondary fuzzy evaluation matrix of the two teaching models A and B is obtained.

Prepare before class

$$R_1(E) = \begin{bmatrix} 0.3 & 0.6 & 0.1 & 0 & 0 \\ 0.2 & 0.5 & 0.3 & 0 & 0 \\ 0.6 & 0.2 & 0.2 & 0 & 0 \\ 0.4 & 0.5 & 0.1 & 0 & 0 \end{bmatrix},$$
$$R_1(H) = \begin{bmatrix} 0.3 & 0.6 & 0.1 & 0 & 0 \\ 0.2 & 0.5 & 0.3 & 0 & 0 \\ 0.6 & 0.1 & 0.2 & 0.1 & 0 \\ 0.4 & 0.4 & 0.1 & 0 & 0 \end{bmatrix}. \tag{26}$$

In-class sessions,

$$R_2(E) = \begin{bmatrix} 0.2 & 0.7 & 0.1 & 0 & 0 \\ 0.3 & 0.6 & 0.1 & 0 & 0 \\ 0.4 & 0.4 & 0.2 & 0 & 0 \\ 0.3 & 0.5 & 0.2 & 0 & 0 \end{bmatrix},$$
$$R_2(H) = \begin{bmatrix} 0.3 & 0.5 & 0.1 & 0.1 & 0 \\ 0.2 & 0.5 & 0.2 & 0.1 & 0 \\ 0.2 & 0.6 & 0.2 & 0 & 0 \\ 0.3 & 0.6 & 0.1 & 0 & 0 \end{bmatrix}. \tag{27}$$

Lecture content

$$R_3(E) = \begin{bmatrix} 0.4 & 0.6 & 0 & 0 & 0 \\ 0.5 & 0.4 & 0.1 & 0 & 0 \\ 0.5 & 0.3 & 0.2 & 0 & 0 \end{bmatrix},$$
$$R_3(H) = \begin{bmatrix} 0.4 & 0.5 & 0.1 & 0 & 0 \\ 0.4 & 0.4 & 0.1 & 0.1 & 0 \\ 0.6 & 0.2 & 0.2 & 0 & 0 \end{bmatrix}. \tag{28}$$

Table 7: Statistical table of comprehensive evaluation results of mixed teaching mode.

First-level indicator (weight)	Secondary indicators (weights)	Rating (E)					Rating (H)				
		Excellent	Good	Middle	And	Difference	Excellent	Good	Middle	And	Difference
Preclass preparation (0.1800)	U_{11} (0.2334)	0.3	0.6	0.1	0	0	0.3	0.6	0.1	0	0
	U_{12} (0.2334)	0.2	0.5	0.3	0	0	0.3	0.4	0.3	0	0
	U_{13} (0.3000)	0.6	0.2	0.2	0	0	0.6	0.1	0.2	0.1	0
	U_{14} (0.1322)	0.4	0.5	0.1	0	0	0.4	0.4	0.1	0.1	0
Session during the lesson (0.1400)	U_{21} (0.4111)	0.2	0.7	0.1	0	0	0.3	0.5	0.1	0.1	0
	U_{22} (0.1823)	0.3	0.6	0.1	0	0	0.2	0.5	0.2	0.1	0
	U_{23} (0.2822)	0.4	0.4	0.2	0	0	0.2	0.6	0.2	0	0
	U_{24} (0.1332)	0.3	0.5	0.2	0	0	0.3	0.6	0.1	0	0
Lecture content (0.2400)	U_{31} (0.5222)	0.4	0.6	0	0	0	0.4	0.5	0.1	0	0
	U_{32} (0.2444)	0.5	0.4	0.1	0	0	0.4	0.5	0.1	0	0
	U_{33} (0.2444)	0.5	0.3	0.2	0	0	0.6	0.2	0.2	0	0
Teaching method (0.1500)	U_{41} (0.3111)	0.3	0.3	0.3	0.1	0	0.4	0.3	0.2	0.1	0
	U_{42} (0.5000)	0.5	0.3	0.2	0	0	0.4	0.2	0.2	0	0
	U_{43} (0.2222)	0.2	0.3	0.3	0.2	0	0.5	0.3	0.2	0	0
Teaching effect (0.2900)	U_{51} (0.5333)	0.3	0.7	0	0	0	0.2	0.6	0.2	0	0
	U_{52} (0.1322)	0.4	0.4	0.1	0.1	0	0.5	0.3	0.2	0	0
	U_{53} (0.3776)	0.5	0.4	0.1	0	0	0.4	0.4	0.1	0.1	0

Teaching style

$$R_4(E) = \begin{bmatrix} 0.4 & 0.6 & 0 & 0 & 0 \\ 0.5 & 0.4 & 0.1 & 0 & 0 \\ 0.5 & 0.3 & 0.2 & 0 & 0 \end{bmatrix},$$
$$R_4(H) = \begin{bmatrix} 0.4 & 0.3 & 0.2 & 0.1 & 0 \\ 0.4 & 0.2 & 0.2 & 0 & 0 \\ 0.5 & 0.3 & 0.2 & 0 & 0 \end{bmatrix}. \quad (29)$$

Teaching effectiveness

$$R_5(E) = \begin{bmatrix} 0.3 & 0.7 & 0 & 0 & 0 \\ 0.4 & 0.4 & 0.1 & 0.1 & 0 \\ 0.5 & 0.4 & 0.1 & 0 & 0 \end{bmatrix},$$
$$R_5(H) = \begin{bmatrix} 0.2 & 0.6 & 0.2 & 0 & 0 \\ 0.5 & 0.3 & 0.2 & 0 & 0 \\ 0.4 & 0.4 & 0.1 & 0.1 & 0 \end{bmatrix}. \quad (30)$$

Calculate the comprehensive fuzzy evaluation set of secondary indicators.

Prepare before class

$$B_1(E) = A_1.R_1(E)$$
$$= (0.2334\ 0.23340.50000.1222). \begin{bmatrix} 0.30.60.1 & 0 & 0 \\ 0.20.50.30.10 \\ 0.60.20.2 & 0 & 0 \\ 0.40.50.1 & 0 & 0 \end{bmatrix}$$
$$= (0.42000.420220.187600),$$
$$B_1(H) = A_1.R_1(H)$$
$$= (0.23340.23340.50000.1332). \begin{bmatrix} 0.30.60.1 & 0 & 0 \\ 0.30.40.3 & 0 & 0 \\ 0.60.10.20.10 \\ 0.40.40.10.10 \end{bmatrix}$$
$$= (0.43320.32670.18650.05220). \quad (31)$$

In-class sessions,

$$B_2(E) = A_2.R_2(E)$$
$$= (0.23340.23340.30000.1222). \begin{bmatrix} 0.20.70.100 \\ 0.30.60.100 \\ 0.40.40.200 \\ 0.30.50.200 \end{bmatrix}$$
$$= (0.28840.56880.141600)$$
$$B_2(H) = A_2.R_2(H)$$
$$= (0.23340.23340.50000.1332). \begin{bmatrix} 0.30.50.10.10 \\ 0.20.50.20.10 \\ 0.20.60.2 & 0 & 0 \\ 0.30.60.1 & 0 & 0 \end{bmatrix}$$
$$= (0.25440.54170.14650.05820). \quad (32)$$

Lecture content

$$B_3(E) = A_3.R_3(E)$$
$$= (0.5222\ 0.2334\ 0.2334). \begin{bmatrix} 0.4\ 0.6 & 0 & 0\ 0 \\ 0.5\ 0.4\ 0.1\ 0\ 0 \\ 0.4\ 0.4\ 0.1\ 0\ 0 \end{bmatrix}$$
$$= (0.55770.47330.060000)$$
$$B_3(H) = A_3.R_3(H)$$
$$= (0.5334\ 0.2334\ 0.2334). \begin{bmatrix} 0.5\ 0.6\ 0.1 & 0 & 0 \\ 0.4\ 0.3\ 0.2\ 0.2\ 0 \\ 0.7\ 0.1\ 0.1 & 0 & 0 \end{bmatrix}$$
$$= (0.55770.407770.12440.03220). \quad (33)$$

Teaching style

$$
\begin{aligned}
B_4(E) &= A_4.R_4(E)\\
&= \begin{pmatrix} 0.2000 & 0.4000 & 0.3000 \end{pmatrix}.\begin{bmatrix} 0.2 & 0.2 & 0.2 & 0.3 & 0 \\ 0.4 & 0.5 & 0.2 & 0 & 0 \\ 0.1 & 0.4 & 0.4 & 0.1 & 0 \end{bmatrix}\\
&= (0.3700.020000.26000.06000),\\
B_4(H) &= A_4.R_4(H)\\
&= \begin{pmatrix} 0.2000 & 0.6000 & 0.3000 \end{pmatrix}.\begin{bmatrix} 0.3 & 0.4 & 0.3 & 0.2 & 0 \\ 0.3 & 0.1 & 0.3 & 0 & 0 \\ 0.5 & 0.3 & 0.2 & 0 & 0 \end{bmatrix}\\
&= (0.43000.26000.10000.02000).
\end{aligned} \tag{34}
$$

Teaching effectiveness

$$
\begin{aligned}
B_5(E) &= A_5.R_5(E)\\
&= \begin{pmatrix} 0.6000 & 0.1444 & 0.3668 \end{pmatrix}.\begin{bmatrix} 0.4 & 0.6 & 0 & 0 & 0 \\ 0.5 & 0.5 & 0.2 & 0.2 & 0 \\ 0.4 & 0.5 & 0.3 & 0 & 0 \end{bmatrix}\\
&= (0.38760.66000.0600.01220)\\
B_5(H) &= A_5.R_5(H)\\
&= \begin{pmatrix} 0.6000 & 0.1444 & 0.3668 \end{pmatrix}.\begin{bmatrix} 0.1 & 0.5 & 0.3 & 0 & 0 \\ 0.6 & 0.2 & 0.3 & 0 & 0 \\ 0.5 & 0.5 & 0.1 & 0.1 & 0 \end{bmatrix}\\
&= (031440.48760.16220.03760).
\end{aligned} \tag{35}
$$

4.3.3. First-Level Fuzzy Evaluation Method. The first step is to obtain a first-level fuzzy evaluation matrix based on the second-level fuzzy evaluation set, as follows:

$$
\begin{aligned}
R(E) &= \begin{bmatrix} B_1 \\ B_2 \\ B_3 \\ B_4 \\ B_5 \end{bmatrix} = \begin{bmatrix} 0.4200 & 0.4022 & 0.1876 & 0 & 0 \\ 0.2884 & 0.5688 & 0.1416 & 0 & 0 \\ 0.5577 & 0.4733 & 0.0600 & 0 & 0 \\ 0.3700 & 0.2000 & 0.2600 & 0.0600 & 0 \\ 0.3876 & 0.6600 & 0.0600 & 0.0122 & 0 \end{bmatrix},\\
R(M) &= \begin{bmatrix} B_1 \\ B_2 \\ B_3 \\ B_4 \\ B_5 \end{bmatrix} = \begin{bmatrix} 0.4332 & 0.3267 & 0.1865 & 0.0522 & 0 \\ 0.2544 & 0.5417 & 0.1465 & 0.0582 & 0 \\ 0.5577 & 0.4077 & 0.1244 & 0.0322 & 0 \\ 0.4300 & 0.2600 & 0.1000 & 0.0200 & 0 \\ 0.3144 & 0.4876 & 0.1622 & 0.0376 & 0 \end{bmatrix}.
\end{aligned} \tag{36}
$$

The second step is to calculate the first-level fuzzy comprehensive evaluation set

$$
\begin{aligned}
B(E) &= A.(E)\\
&= \begin{pmatrix} 0.1700 & 0.1300 & 0.2500 & 0.1600 & 0.2910 \end{pmatrix}.\begin{bmatrix} 0.4200 & 0.4022 & 0.1876 & 0 & 0 \\ 0.2838 & 0.5799 & 0.1714 & 0 & 0 \\ 0.6644 & 0.4822 & 0.0600 & 0 & 0 \\ 0.3811 & 0.4000 & 0.2600 & 0.0600 & 0 \\ 0.3768 & 0.6600 & 0.0600 & 0.0143 & 0 \end{bmatrix}\\
&= (0.3805\,0.47920.22910.01500),\\
B(H) &= A.(H)\\
&= \begin{pmatrix} 0.1700 & 0.1500 & 0.2300 & 0.1600 & 0.2800 \end{pmatrix}.\begin{bmatrix} 0.4222 & 0.3366 & 0.1876 & 0.0355 & 0 \\ 0.2533 & 0.5164 & 0.1535 & 0.0538 & 0 \\ 0.5577 & 0.5044 & 0.1322 & 0.0400 & 0 \\ 0.4300 & 0.2600 & 0.1000 & 0.0200 & 0 \\ 0.4133 & 0.4786 & 0.1733 & 0.0371 & 0 \end{bmatrix}\\
&= (0.37540.48010.14610.02990).
\end{aligned} \tag{37}
$$

Finally, the comprehensive evaluation is calculated.

If V (evaluation set) is assigned to $V = \{95, 80, 70, 60, 50\}$, the comprehensive evaluation result of mixed teaching is

$$M(E) = B(E).V^T$$

$$= \begin{pmatrix} 0.3905 & 0.4728 & 0.1180 & 0.0144 & 0 \end{pmatrix}. \begin{bmatrix} 95 \\ 80 \\ 70 \\ 60 \\ 50 \end{bmatrix} = 85.1. \tag{38}$$

The results of the comprehensive evaluation of routine teaching are as follows:

$$M(H) = B(H).V^T$$

$$= \begin{pmatrix} 0.3655 & 0.4207 & 0.1611 & 0.0258 & 0 \end{pmatrix}. \begin{bmatrix} 95 \\ 80 \\ 70 \\ 60 \\ 50 \end{bmatrix} = 83.0. \tag{39}$$

After calculating the results of both teaching methods, the results are between 80 and 95, and the evaluation results of mixed teaching are better than those of conventional teaching. That is, mixed teaching is better than regular teaching.

4.4. Analysis of Results. The fuzzy comprehensive evaluation is used to construct the online and offline hybrid teaching model of physical education courses, and the mixed teaching is evaluated, which solves the shortcomings of qualitative evaluation, combines qualitative and nonqualitative, and reduces the impact of human factors on its results, so as to make the fuzzy comprehensive evaluation more comprehensive, reasonable and accurate expression. In the calculation of data results, the preclass preparation, the middle of the class, the teaching content, the teaching method, the teaching effect are calculated, and the results obtained are that its mixed teaching is higher than that of conventional teaching, from which it can be obtained that mixed teaching provides a strong help for students to learn knowledge and teachers to teach knowledge.

5. Conclusion

Based on the construction of the online and offline hybrid teaching mode of physical education courses with fuzzy comprehensive evaluation, through the establishment of the fuzzy comprehensive evaluation model, the processing of fuzzy operators and indicators is determined, and the online and offline hybrid teaching model of physical education with fuzzy comprehensive evaluation is obtained, and the experiments are designed and the experiments are grouped into experimental groups (online and offline mixed teaching mode) and conventional groups (traditional teaching mode), and the two groups are prepared before class, in the middle of class, teaching content, teaching methods, The teaching effect is calculated in these aspects, and the online and offline hybrid teaching model is analyzed and compared to obtain the online and offline hybrid teaching model, which not only improves the students' independent learning ability but also enables students to grasp the knowledge and skills taught in physical education faster and better, so that the teaching effect is greatly improved and the student's performance is also improved. Although this paper has achieved some results on this basis, we can also optimize and improve this problem, such as:

(1) In the calculation of data results in this paper, the calculation process is too complicated to calculate the results in combination with programming

(2) Fuzzy comprehensive evaluation is applied to the online and offline mixed mode structure study of physical education courses to show its advantages; in this regard, fuzzy comprehensive evaluation can be further optimized, which is also a direction for future research

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 authors declared that they have no conflicts of interest regarding this work.

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