Research Article

Evaluation Method of Creative Dance Teaching Quality Based on Fuzzy Comprehensive Evaluation

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In order to improve the teaching quality of creative dance, this paper puts forward an evaluation method of creative dance teaching quality based on fuzzy comprehensive evaluation. On the basis of clarifying the evaluation criteria, the overall framework of the creative dance teaching quality evaluation system is given; the hardware part optimizes the design of the database and storage module of creative dance teaching-related materials, and the software part completes the quality evaluation of creative dance teaching through the fuzzy comprehensive evaluation method. Experiments show that the proposed method can effectively evaluate the quality of creative dance teaching; when collecting data, the resource discovery rate is high, and the data collection effect is better; the method has high data storage capacity, low rejection times, and good data storage performance.

1. Introduction

The creative dance education is different from traditional dance education. The traditional dance education mainly emphasizes “one move, one board, one eye,” and pays more attention to the training of physical skills [1]. Creative dance stresses constantly change to stimulate thinking rotation, so that students do not mechanically imitate action shapes in class, but control their body movements through their own brains [2, 3]. Creative dance education is the dual development of students’ body and wisdom. Teachers should patiently induce students’ natural needs for creation and do not encourage students to pursue artistic results prematurely. Therefore, the relevant teaching evaluation methods have attracted extensive attention of scholars.

Reference [4] studies the dance teaching practice of preschool children under the concept of OBE. This method is based on students’ dance teaching needs after taking office, from clarifying the direction of curriculum objectives, modifying traditional teaching content, extending teaching implementation methods, and broadening the level of teaching evaluation. It has trained preschool art teachers with comprehensive ability. This method improves the quality of dance teaching for preschool education students. Reference [5] aims at the current situation of dance teaching of preschool education specialty, from formulating the “dance curriculum goal” of preschool education specialty to transforming the core quality of dance subjects; adjust the dance curriculum structure based on core literacy and professional standards; vigorously strengthen the research and development of dance teaching materials for preschool education; establish the integrated dance course teaching mode of preschool education specialty; optimize the teaching methods of dance courses in preschool education; and establish a diversified assessment and evaluation system based on dance core literacy and professional standards; this paper puts forward teaching reform measures from the aspects of changing teaching ideas and improving the “professional” quality of dance teachers. The above two methods mainly focus on teaching reform and teaching mode innovation, and less on the evaluation content. Reference [6] established a multi-attribute fuzzy evaluation model of sports dance teaching quality based on fuzzy theory and gray system theory. Finally, it puts forward some
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Because the attributes of creative dance teaching quality evaluation methods need to be further tested and analyzed. According to the comprehensive analysis of the above reference, the research content on dance teaching is mainly divided into two parts. One part mainly focuses on teaching and does not involve evaluation. The other part designs the evaluation content, but due to the particularity of creative dance teaching, the performance of the corresponding evaluation methods needs to be further tested.

The premise of fuzzy comprehensive evaluation is fuzzy mathematics. It belongs to a method of simulating the human brain to analyze fuzzy information. It has the function of multi-level evaluation [8]. It has obvious advantages in dealing with uncertain problems and effectively improves the objectivity and accuracy of evaluation results. In order to improve the interactivity and practicability of the evaluation, this paper designs a creative dance teaching quality evaluation system based on fuzzy comprehensive evaluation from two aspects of hardware and software. Finally, the effectiveness of this method is verified by performance test.

2. Design of Creative Dance Teaching Quality Evaluation System

2.1. Selection of Evaluation Criteria. Because the attributes of creative dance teaching are more complex, it needs to be handled very carefully when establishing the quality evaluation standard system of creative dance teaching. In order to scientifically evaluate the quality of creative dance teaching, the following principles should be observed when selecting standards:

1. Leading type and representativeness: select the key factors that restrict the teaching quality from the numerous standards that interfere with creative dance teaching, and improve the simplicity and scientifcity of the evaluation of creative dance teaching quality [9]. The selected standards also need to be representative, and they also need to be widely representative in different stages, so that the evaluation results can be compared with each other to provide basis for scientific decision-making.

2. Desirability and practicability: the selection criteria not only need to be practical, but also need to be easy to obtain; that is, it is easy to capture data and conduct quantitative processing of data at the same time. The system does not need to be too large and simple to facilitate calculation and analysis, and the standards used need to be accepted by relevant departments and consistent with the standards of national statistical departments as far as possible.

3. Objectivity and comprehensiveness [10]: the standard system needs to comprehensively reflect the quality of creative dance teaching, but it also needs to avoid less relevant and practical standards.

2.2. Overall System Architecture Design. According to the above evaluation criteria, a creative dance teaching quality evaluation system is constructed by using fuzzy comprehensive evaluation. The system structure is shown in Figure 1.

Use the database to collect relevant data of creative dance teaching. Collect and store the data related to the evaluation of creative dance teaching quality through the data access layer, which is responsible for providing the business entity layer with the data required for the evaluation of creative dance teaching quality, collecting the data related to the evaluation of creative dance teaching quality by using the data acquisition module, and storing the data required for the evaluation of creative dance teaching quality in the data storage module to improve the data access efficiency; build a data storage module according to HDFS file system [11] to store data related to the evaluation of creative dance teaching quality and improve the fault tolerance of data storage. The business entity layer is responsible for determining different business logics. The most critical modules are the system management module and the creative dance teaching quality evaluation management module. The system management module provides the evaluation index system for the creative dance teaching quality evaluation management module. The creative dance teaching quality evaluation management module completes the creative dance teaching quality evaluation through the fuzzy comprehensive evaluation method according to the evaluation index system. The business appearance and rule layer belong to the control layer [12], which is used to control the permissions of users at different levels to view the evaluation results and edit the corresponding business appearance and role permissions in different forms and control functions according to the attributes of each object. The user interface layer belongs to the view interface of the system and presents the evaluation results to users.

2.3. Hardware Module Design. According to the system structure of Figure 1, the hardware module is designed from the following aspects.

2.3.1. Data Storage Module. The data storage module is built according to the HDFS file system, and the specific architecture is shown in Figure 2.

The function of metadata server is to store metadata information of small files. If the file of the database is a small file, the file is stored in the data storage module according to the additional writing method, and the metadata information of the file is recorded in the metadata server. When the system needs to call the file, it can directly locate and read the metadata information according to the file, so as to improve the efficiency of data call; in the process of calling a file that
does not exceed the file block, the DSF server can directly go to the data node, which can directly transmit the call data for the business entity layer, reduce the pressure on the DSF server, and speed up the response time of the server. Hive metadata server is used to analyze the metadata information of hive table. It has the function of log analysis. The log analysis results are stored in the relational data and can be viewed by users. The function of the central controller is to manage and maintain all files in the data storage module [13]; the secondary central controller backs up the namespace image file in the central controller to improve the fault tolerance of data storage.

2.3.2. Database Design. The construction of the database is the data storage process of the key steps in the design and development cycle of the evaluation system. The data stored in the database [14] are the basic data of the overall structure of the evaluation system. At the same time, the construction quality of the database will directly interfere with the evaluation results of the evaluation system.

When designing the system at the beginning, the data will be stored through the Derby database [15]. Derby is a platform-independent, open-source, and easy-to-manage database management system, which can support all the features in the database, such as crash recovery, row/table-level lock, transaction rollback, view, transaction submission, subquery description, foreign key/primary key constraint, and trigger.

In addition, in order to ensure the scientificity of the database, we need to comply with the three most basic paradigms. These three paradigms can be divided into four tables: single table, tree table, associated table, and master-slave table. They have five kinds of constraints: primary key constraint, uniqueness constraint, nonempty constraint, foreign key constraint, and check constraint.

2.3.3. Creative Dance Teaching Data Processing Module. In the actual evaluation process of creative dance teaching quality, it is necessary to analyze the evaluation objectives and creative dance teaching environment. The results
obtained through the analysis can enable the evaluators to better evaluate the quality of creative dance teaching. This module includes creative dance teaching database, graphic drawing, and evaluation data statistics.

2.4. Software Design. On the basis of hardware design, the quality evaluation system of creative dance teaching is optimized from the aspect of software design. The theoretical basis of the software part is the fuzzy comprehensive evaluation method. The specific implementation process of this method is as follows:

The first step is to clarify the factors affecting the quality evaluation system of creative dance teaching and establish the evaluation index system of creative dance teaching quality evaluation system.

The second step is to determine the weight of each index [16, 17].

The third step is to determine the standard set of the evaluation index system evaluation level of the creative dance teaching quality evaluation system and determine the membership of each index in the index system according to the expert scoring results and the membership function model.

The fourth step is to conduct multi-level comprehensive evaluation according to the weight and membership degree of each index obtained in the second and third steps, and the evaluation results of the upper level index can be obtained from the last level index in turn.

The fifth step is to get the comprehensive evaluation results of the creative dance teaching quality evaluation system.

2.4.1. Fuzzy Comprehensive Evaluation Model. The fuzzy comprehensive evaluation model is established through index set $U = \{u_1, u_2, \ldots, u_m\}$, evaluation set $P = \{p_1, p_2, \ldots, p_n\}$, and evaluation matrix $V$, so that the weight of each index is fuzzy subset $W = \{w_1, w_2, \ldots, w_m\}$ in $U$, the weight corresponding to the $i$-th index is $w_i$, and $\sum_{i=1}^{m} w_i = 1$; the judgment of the $i$-th index is the fuzzy relationship $V_i(v_{i1}, v_{i2}, \ldots, v_{in})$ in $U$ to $P$, and then the $V$ of $m$ indexes is as follows:

$$V = \begin{pmatrix} v_{11} & v_{12} & \cdots & v_{1n} \\ v_{21} & v_{22} & \cdots & v_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ v_{m1} & v_{m2} & \cdots & v_{mn} \end{pmatrix}.$$  \hspace{1cm} (1)

There are many evaluation indexes to be referred to in the evaluation of creative dance teaching quality, and there are certain levels between each index, so it is necessary to classify $U$, carry out comprehensive evaluation on various types [18], and then carry out multi-level comprehensive evaluation on the evaluation results. Therefore, $u_1$ in $U$ is constructed as $u_1 = \{u_{11}, u_{12}, \ldots, u_{1k}\}$ through K sub-index, $u_2$ is constructed as $u_2 = \{u_{21}, u_{22}, \ldots, u_{2o}\}$ through a sub-index, and similarly, $u_m$ is constructed as $u_m = \{u_{m1}, u_{m2}, \ldots, u_{mj}\}$ through $l$ sub-index.

For a single sub-index $u_{il}$ in $u_i$, $V^{(l)}_{il}$ is obtained from the evaluation results of each evaluation index:

$$V^{(l)}_{i} = \begin{pmatrix} v^{(l)}_{11} \\ v^{(l)}_{12} \\ \vdots \\ v^{(l)}_{1n} \end{pmatrix}_{m \times n}. \hspace{1cm} (2)$$

Obtain $F_i^{(l)} = \{w^{(l)}_{1}, f^{(l)}_{11}, f^{(l)}_{12}, \ldots, f^{(l)}_{1n}\}$ according to the synthetic operation formula, that is, obtain the primary fuzzy evaluation result [19], and then take $F_i^{(l)}$ as the single index evaluation vector of $u_i$ to obtain $V^{(2)}$ of all indexes related to $U$:

$$V^{(2)} = \begin{pmatrix} F^{(l)}_{1} \\ F^{(l)}_{2} \\ \vdots \\ F^{(l)}_{m} \end{pmatrix} = \begin{pmatrix} f^{(l)}_{11} & f^{(l)}_{12} & \cdots & f^{(l)}_{1n} \\ f^{(l)}_{21} & f^{(l)}_{22} & \cdots & f^{(l)}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ f^{(l)}_{m1} & f^{(l)}_{m2} & \cdots & f^{(l)}_{mn} \end{pmatrix}. \hspace{1cm} (3)$$

Finally, obtain the comprehensive evaluation vector of $U$:

$$F^{(2)} = \{f_1, f_2, \ldots, f_m\}. \hspace{1cm} (4)$$

There are several evaluation subjects in the evaluation system. Solve the comprehensive evaluation vector $F_1, F_2, F_3, \ldots$, of each evaluation subject, respectively, to obtain the overall comprehensive evaluation matrix $V = \{F_1, F_2, F_3, \ldots\}$ [20]. According to the weight $W = \{W_1, W_2, W_3, \ldots\}$ of each evaluation subject, obtain $F = \sum W_i V_i$, which belongs to the final evaluation result matrix. Obtain the final comprehensive evaluation value $Y$ (score) $F$ according to $Y = FG^T$, and the transposition of the evaluation grade scoring line vector is $G$.

2.4.2. Weight Distribution Scheme. Describe the weight distribution scheme using Euclidean distance [21, 22] $\beta$ and alternative weight allocation scheme $\alpha$. The feasible degree is as follows:

$$d_\epsilon(\alpha, \beta) = \left( \sum_{i=1}^{m} |a_i - \beta_i|^2 \right)^{1/2}. \hspace{1cm} (5)$$

According to $d$, the selection method of index weight allocation scheme can be defined. Let $W' = \{w'_{11}, w'_{12}, \ldots, w'_{1n}\}$ be a weight allocation scheme, and the number of indicators is $s$. According to the weight set of each single indicator in the same category [23, 24], suppose that the set of different index weight distribution schemes designed by several experts is $\mathbb{W}_s = \{w'_1, w'_2, \ldots, w'_s\}$, and the number of index weight distribution schemes designed by experts is $s$. Select a weight distribution scheme that can meet all other weight distribution schemes in $s$ distribution schemes; that is, select an $W'$ and $W'$ in $\mathbb{W}$, which must be representative to make it meet:

$$W' = \arg \max_{\varepsilon} \sum_{i=1}^{s} d(W'', W'). \hspace{1cm} (6)$$
4.3. Realize the Evaluation of Creative Dance Teaching Quality. This paper selects the quality of creative dance teaching as the main factor, establishes the index evaluation set, and then uses the fuzzy comprehensive evaluation method [25, 26] to calculate the index evaluation set. This time, the evaluation of creative dance teaching quality is divided into five different levels. The first class is that the teaching quality of creative dance is very poor, and the expert score is 9; the second grade is that the teaching quality of creative dance is relatively poor, and the expert score is 7; the third grade is the general quality of creative dance teaching, and the expert score is 5; the fourth grade is that there are few problems in the quality of creative dance teaching, and the expert score is 3; the fifth grade is the excellent quality of creative dance teaching, and the expert score is 1. The higher the score, the worse the quality of creative dance teaching.

According to the index evaluation set corresponding to the index weight of creative dance teaching quality extracted, the set composed of creative dance teaching quality factors of fuzzy comprehensive evaluation is obtained, and the fuzzy transformation is carried out:

$$X_0 K = Y, y_i = x_j \times k_{ij}.$$  

Among them, $X$ is the weight of the factors affecting the quality of creative dance teaching; $K$ is fuzzy matrix; $Y$ is the result of fuzzy transformation; $o$ is the operation symbol of fuzzy synthesis operation; $y_i$ is the influencing factor of a specific creative dance teaching quality; $x_j$ is the weight of the factors affecting the quality of specific creative dance teaching; $k_{ij}$ is the value assigned to the fuzzy matrix. When the grade calculated by the comprehensive fuzzy judgment exceeds class III (including class III), the calculated result is transmitted to the display interface of the system through the network communication protocol. Give warnings to teachers or relevant leaders through the display interface of the system, so as to complete the software design of creative dance teaching quality evaluation system.

3. Experimental Analysis

In order to verify the effectiveness of the method proposed in this paper, the multi-attribute fuzzy evaluation model of sports dance teaching quality in reference [6] is used as comparison method 1, and the multiple intelligences evaluation method in reference [7] is used as comparison method 2 to carry out the following experiments.

3.1. System Development Environment. Select ASP Net as the development platform of creative dance teaching quality evaluation system, ASP Net is built on the common language runtime, so a variety of applications can be added between the web interface and the database, which increases the user access of the system and facilitates the maintenance and operation of the system. The selected system development language is c# language, the system development environment platform is Microsoft Visual Studio 2005, and the installed server, switch, and router models are IBM System x3300, s5700-24tp-si, and H3C er3100, respectively. Connect the hardware system of the system according to the design structure and put it into use after debugging to avoid the error of test results caused by hardware failure.

3.2. Data Collection and Sample Selection. In order to ensure the accuracy of the experimental results, an educational platform is selected as the experimental object, and the students’ feedback is taken as the data sample of the experiment. During the experiment, the actual creative dance teaching quality is artificially controlled, and the students’ quality evaluation results are adjusted. The set quality evaluation results are used as the standard comparison results of the experiment.

3.3. Results and Analysis

3.3.1. Evaluation Effect Test. Using this system to evaluate the creative dance teaching quality, test the evaluation effect of the creative dance teaching quality of this system, and analyze the teaching quality of the education platform. The evaluation set $P = \{P_1, P_2, P_3, P_4, P_5\}$ represents good, good, average, poor, and poor, respectively. The score table of creative dance teaching quality evaluation is shown in Table 1.

Using the system in this paper, the fuzzy evaluation matrix of the weight of creative dance teaching quality evaluation index and three-level index is obtained, and the obtained results are shown in Tables 2 and 3.

According to the data in Tables 2 and 3, the evaluation results of the creative dance teaching quality of the education platform are calculated by using the system in this paper. The evaluation results of each level-1 index are 98 points, 93 points, 91 points, and 83 points, respectively, and the average score of the four level-1 indexes is 91.25 points. According to the level score in Table 1, the evaluation results of the creative dance teaching quality of the education platform are good. Experiments show that this system can effectively evaluate the quality of creative dance teaching of the education platform. According to the evaluation results, the teaching staff of the education platform is relatively poor. In the future, we need to focus on expanding the teaching staff and improving the quality of creative dance teaching.

3.3.2. Teaching Quality Data Collection Effect. Data collection is the basic operation of the system. In order to ensure the accuracy of the system evaluation, accurate data are needed as support, highlighting the importance of data collection. Test the resource discovery rate of the system when collecting data related to the evaluation of creative dance teaching quality in the education platform. The higher the resource discovery rate, the better the system data collection effect. The test results are shown in Figure 3.

According to Figure 3, with the increase of the amount of data, the resource discovery rate of the data collected by the...
system in this paper shows an upward trend. When the amount of data reaches 35 TB, the resource discovery rate of the data collected by the system in this paper is close to 100%, indicating that the data collection effect is the best at this time. When the amount of data is small, the minimum resource discovery rate of the system in this paper has

<table>
<thead>
<tr>
<th>Grade</th>
<th>Good</th>
<th>Preferably</th>
<th>Commonly</th>
<th>Poor</th>
<th>Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>≥95 (95, 85]</td>
<td>(85, 70]</td>
<td>(70, 60]</td>
<td>&lt;60</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary index</th>
<th>Weight</th>
<th>Secondary index</th>
<th>Weight</th>
<th>Tertiary indicators</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching ideas, methods, and objectives</td>
<td>0.21</td>
<td>Teaching concept</td>
<td>0.42</td>
<td>Highlight the main body of students</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teaching methods</td>
<td>0.30</td>
<td>Teach students in accordance with their aptitude</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teaching objectives</td>
<td>0.28</td>
<td>Diversity of teaching methods</td>
<td>0.35</td>
</tr>
<tr>
<td>Teaching process, resources, and activities</td>
<td>0.34</td>
<td>Teaching process</td>
<td>0.38</td>
<td>Progressiveness of teaching methods</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teaching resources</td>
<td>0.33</td>
<td>Cultivate practical ability</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teaching activities</td>
<td>0.29</td>
<td>Cultivate autonomous learning ability</td>
<td>0.54</td>
</tr>
<tr>
<td>Teaching attitude and feedback</td>
<td>0.22</td>
<td>Teaching attitude</td>
<td>0.48</td>
<td>Interactive link settings</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Curriculum evaluation</td>
<td>0.52</td>
<td>Scientific nature of time planning</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Resource-type richness</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Degree of meeting students’ needs</td>
<td>0.34</td>
</tr>
<tr>
<td>Teaching staff</td>
<td>0.23</td>
<td></td>
<td></td>
<td>Theoretical teaching activities</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Practical teaching activities</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Teacher-student ratio</td>
<td>0.53</td>
</tr>
<tr>
<td>Faculty and structure</td>
<td>0.41</td>
<td></td>
<td></td>
<td>There is a proportion of master’s and doctoral degrees among teachers in school</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Qualification of lecturer</td>
<td>0.68</td>
</tr>
<tr>
<td>Lecturer</td>
<td>0.59</td>
<td></td>
<td></td>
<td>Lectures of professors and associate professors</td>
<td>0.32</td>
</tr>
</tbody>
</table>

| Tertiary indicators                                                                                                               | \( p_1 \) | \( p_2 \) | \( p_3 \) | \( p_4 \) | \( p_5 \) |
| Highlight the main body of students                                                                                               | 0.24     | 0.28     | 0.21     | 0.11     | 0.16    |
| Teach students in accordance with their aptitude                                                                               | 0.18     | 0.27     | 0.13     | 0.23     | 0.19    |
| Diversity of teaching methods                                                                                                    | 0.42     | 0.08     | 0.17     | 0.21     | 0.12    |
| Progressiveness of teaching methods                                                                                                | 0.02     | 0.13     | 0.48     | 0.25     | 0.12    |
| Cultivate practical ability                                                                                                       | 0.61     | 0.19     | 0.01     | 0.09     | 0.10    |
| Cultivate autonomous learning ability                                                                                             | 0.21     | 0.39     | 0.28     | 0.09     | 0.03    |
| Interactive link settings                                                                                                         | 0.01     | 0.27     | 0.52     | 0.11     | 0.09    |
| Scientific nature of time planning                                                                                               | 0.59     | 0.18     | 0.03     | 0.11     | 0.09    |
| Resource-type richness                                                                                                           | 0.11     | 0.01     | 0.42     | 0.26     | 0.20    |
| Degree of meeting students’ needs                                                                                                 | 0.22     | 0.28     | 0.31     | 0.11     | 0.08    |
| Theoretical teaching activities                                                                                                   | 0.32     | 0.41     | 0.12     | 0.03     | 0.12    |
| Practical teaching activities                                                                                                      | 0.02     | 0.13     | 0.38     | 0.28     | 0.19    |
| Respect students and be enthusiastic in class                                                                                     | 0.12     | 0.31     | 0.26     | 0.00     | 0.31    |
| Prepare well before class and attend class on time                                                                               | 0.09     | 0.43     | 0.00     | 0.27     | 0.21    |
| Answer questions in class patiently and timely                                                                                    | 0.23     | 0.52     | 0.00     | 0.25     | 0.00    |
| Careful evaluation of homework and course assessment                                                                               | 0.33     | 0.39     | 0.12     | 0.01     | 0.15    |
| Course qualification rate                                                                                                         | 0.16     | 0.00     | 0.33     | 0.31     | 0.20    |
| Multi-direction evaluation                                                                                                        | 0.14     | 0.28     | 0.00     | 0.26     | 0.32    |
| Teacher-student ratio                                                                                                             | 0.21     | 0.00     | 0.33     | 0.22     | 0.24    |
| There is a proportion of master’s and doctoral degrees among teachers in school                                                  | 0.23     | 0.33     | 0.24     | 0.11     | 0.09    |
| Qualification of lecturer                                                                                                         | 0.00     | 0.61     | 0.12     | 0.08     | 0.19    |
| Lectures of professors and associate professors                                                                               | 0.00     | 0.00     | 0.72     | 0.26     | 0.02    |
exceeded 96.5%, and the resource discovery rate is also high at this time. Experiments show that this system has a high resource discovery rate in data acquisition, which shows that the data acquisition effect of this system is better and more valuable data can be collected.

3.3.3. Function Operation Effect. In this experiment, the final experimental results are obtained by averaging multiple experiments. Therefore, six groups of evaluation data are set, respectively, and specific creative dance teaching quality scores are set to compare the error between the output results of the three evaluation systems and the setting results. The test results of system function operation effect are shown in Table 4.

As can be seen from the score output in Table 4, the average evaluation error of comparison method 1 and comparison method 2 is 2.83 and 2.0, respectively, while the average evaluation error of the designed creative dance teaching quality evaluation system is 1.17. In contrast, the evaluation function of the creative dance teaching quality evaluation system based on fuzzy comprehensive evaluation has better operation effect and higher evaluation accuracy.

3.3.4. Test of Total Stored Data and Rejection Times. In order to verify the data storage performance of the system in this paper, tested the total amount of stored data and rejection times of the three systems for storing different requests. The test results are shown in Figures 4 and 5.

According to Figures 4 and 5, the larger the number of requests, the total amount of stored data of the three methods has increased, and the method in this paper has the largest increase. When the requested quantity is $16 \times 10^3$ times, the total amount of stored data reaches 9.3 tb. It can be seen that the total amount of data stored in this method is significantly higher than the other two methods at different request quantities, which indicates that this method has better storage performance in storing data; the number of requests is directly proportional to the rejection times of the three methods. The method in this paper increases slightly with the increase of the number of requests, and the growth rate is relatively slow. The rejection times of the other two methods increase faster, indicating that this method can meet all data storage requests of the method as much as possible, and the rejection times are the lowest.

3.3.5. Method Performance Test. In practical application, the improvement of method performance only depends on the improvement of accuracy and recall rate, and the effect is not ideal. Therefore, another index should be given by combining accuracy and recall rate, represented by $Q_i$. Therefore, in this experiment, the accuracy ($b$), recall ($m$), accuracy ($H$), and $Q_i$ value are taken as the performance comparison indexes of the three methods. The calculation method of each index is as follows:

$$
H = \frac{R_H}{R_H + Q_H},
$$
$$
M = \frac{R_H}{R_H + Q_F},
$$
$$
B = \frac{R_H + R_F}{R_H + Q_H + R_F + Q_F},
$$
$$
Q_i = \frac{2 \cdot H \cdot M}{H + M}.
$$

where $R_H$ is the number of times that an evaluation index exists and is tested at the moment; $Q_H$ is the number of times that an evaluation index does not exist at the moment and the result is that it exists; $R_F$ is the number of times that an evaluation index does not exist and the result does not exist at the moment; and $Q_F$ is the number of times an evaluation index exists but has not been tested.

900 groups of characteristic data were randomly selected and evenly distributed in the training and evaluation of the three methods, of which 75% (225 groups) of the data were used as part of the training samples, and the remaining 25% (75 groups) of the data were used as test samples. The performance of the three methods was compared with the accuracy ($H$), recall ($m$), accuracy ($b$), and $Q_i$ values as the comparison indicators of the performance of the three methods. In the experiment, the effectiveness of the experimental data is ensured through four training and inspection processes. The evaluation index accuracy, $Q_i$ value, accuracy, and recall rate of each method in the inspection results are calculated. The calculation results are shown in Table 5, and the average accuracy, average $Q_i$ value, average accuracy and average recall rate of each method are calculated according to Table 5. The calculation results are shown in Table 6.

By analyzing Tables 5 and 6, it can be concluded that the performance indexes of this method are almost higher than those of the other two methods, and the average accuracy, average $Q_i$ value, average accuracy, and average recall rate reach more than 92%, which is much higher than those of
Table 4: Comparison results of system function operation effect test.

<table>
<thead>
<tr>
<th>Experimental group</th>
<th>Set score (score)</th>
<th>Comparison method 1 output score (point)</th>
<th>Comparison method 2 output score (point)</th>
<th>Output score of this method (point)</th>
</tr>
</thead>
<tbody>
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<td>1</td>
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<td>96</td>
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<td>95</td>
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</tr>
</tbody>
</table>

Figure 4: Test results of total stored data.

Figure 5: Test results of rejection times.
the other two methods, indicating that this method has better performance in evaluating the quality of creative dance teaching.

3.3.6. **Student Satisfaction Test.** Satisfaction test is to apply the designed creative dance teaching quality evaluation system to the actual teaching and adjust the teaching mode and teaching attitude combined with the evaluation results of the design method. Observe the changes in students’ satisfaction with the quality of creative dance teaching before and after the application of the method. After a period of operation cycle, the comparison results of satisfaction before and after the application of the method are obtained, as shown in Figure 6.

As can be seen from Figure 6, the students’ satisfaction has increased significantly after the application of the creative dance teaching quality evaluation method, and the satisfaction is higher than 85%. Therefore, it can be determined that this method has certain application value in the actual creative dance teaching quality work.

4. **Conclusion**

In order to improve the quality of creative dance teaching, this paper designs a creative dance teaching quality evaluation system based on fuzzy comprehensive evaluation, obtains the comprehensive evaluation results according to the fuzzy comprehensive evaluation method, obtains the
shortcomings of creative dance teaching quality according to the evaluation results, and formulates relevant strategies to improve the quality of creative dance teaching. The experimental test shows that the system in this paper has good application effect in the field of evaluation.

**Data Availability**

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

**Conflicts of Interest**

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

**References**


