

Retraction

Retracted: Evaluation of Students' Educational Management Quality Based on Intuitionistic Fuzzy Information

Advances in Multimedia

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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

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

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

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

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

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

References

- [1] F. Cao, "Evaluation of Students' Educational Management Quality Based on Intuitionistic Fuzzy Information," *Advances in Multimedia*, vol. 2022, Article ID 2928512, 13 pages, 2022.

Research Article

Evaluation of Students' Educational Management Quality Based on Intuitionistic Fuzzy Information

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In order to further improve the scientificity and rationality of students' education management quality evaluation, this paper proposes a method of students' education management quality evaluation based on intuitive fuzzy information. This method makes a scientific judgment on the teaching management process and teaching results in combination with the objectives of students' education and teaching management. On the basis of teaching evaluation, with the help of intuitionistic fuzzy information integration algorithm method, this paper focuses on using intuitionistic fuzzy-weighted average operator and normal distribution weighting method to construct the quality evaluation model of students' education and teaching management, and develops the teaching quality evaluation system based on intuitionistic fuzzy theory. Through the two-level fuzzy comprehensive evaluation, the teacher evaluation result score is 81.45, which is an algebraic value from 0 to 100, and the score is between 80 and 90, which verifies that the classroom teaching evaluation result is good.

1. Introduction

The purpose and significance of teaching evaluation is to determine teaching and learning performance according to teaching objectives, to determine teaching research through teaching strategies, and to arrange examinations and tests for students [1]. For the evaluation of teachers' teaching process, in the specific practical process, most colleges and universities combine student evaluation and supervision expert evaluation. Specifically, after completing an academic program, students can use the school network to evaluate teachers' teaching procedures and teaching programs based on evaluation criteria, and show, that is, online teaching evaluation; on the other hand, the evaluation process of the teacher's professional mentor provides the same guidance. It can be seen that the design of the research process and the best teaching measures can measure the teaching process more objectively and fairly [2]. Therefore, this paper develops a teaching evaluation management system based on intuitionistic fuzzy theory and verifies the rationality of this algorithm through comprehensive evaluation. As a tool, fuzzy mathematics has been widely used in fuzzy decision-

making, fuzzy evaluation, and other fields. For example, the use of fuzzy mathematics theory can simulate the activities of the human nervous system, which can greatly improve the ability of pattern recognition. The temperature control is more reasonable, which can improve the power saving and water saving ability of the washing machine. Fuzzy mathematics has been applied to all aspects of modern life and has played an increasingly important role in human life. In the teaching evaluation of higher vocational colleges, the analysis results obtained by the fuzzy mathematics theory will be more in line with the reality.

2. Literature Review

In the study of teaching quality evaluation, European and American countries also adopt the traditional mode of students scoring teachers. The focus of evaluation is to supervise teachers' teaching work and judge the quality of teachers' work [3]. With the development of various educational models, scholars from various countries began to reflect on the disadvantages of this evaluation method and successively put forward some new teaching quality

evaluation methods. The focus of evaluation also shifted to giving full play to teachers' initiative, striving to evaluate nonlinearity, so as to achieve an objective, fair, and true reflection of teachers' actual level. At present, the United States adopts teaching quality evaluation methods, which are typically value-added evaluation method, "peer evaluation" and "teaching students according to their aptitude." The "value-added evaluation method" is a follow-up evaluation. It does not draw a conclusion based on the students' achievements at one time, but establishes the students' learning files in recent years by tracking the students' cumulative learning situation over the years and contacting the students' schools and teachers. The duration of this period is often more than three years and then evaluates the teaching effect of the student's school or teacher according to the obtained data, information, and effect [4]. "Peer evaluation method" is that excellent teachers with more than five years of teaching experience are selected through layers of assessment to enter the classroom of the evaluated teachers, listen carefully, and assess the teachers' teaching ability from multidimensional standards. Many teachers participate in each class and finally make a comprehensive evaluation. "Teaching according to materials" is aimed at teachers. It takes into account the differences between individual teachers. For example, new teachers and old teachers have different teaching experiences. If they use the same standard to evaluate, it will be unfair, which will not only attack new teachers but also promote old teachers. This method adopts different evaluation criteria for different teachers, for example, in the first year to obtain the test scores of new teachers; in the second year, some length tests will be added to this library, which is not only used in the set and has the idea of problems, but also plays a certain role to support [5]. Yale Presidents discuss issues related to quality teaching from the perspectives of governance, teaching, and learning, and incorporate recognition and monitoring of quality teaching into assessments.

In China, the research on teaching quality evaluation system started relatively late, and many schools also have their own evaluation system, but many of them rely on a simple management system and summarize on the basis of scoring by teachers and students, such as average score and ranking. It is a simple algorithm of addition, subtraction, multiplication, and division, which is implemented in the system. In doing so, the conclusion is naturally not scientific and comprehensive enough. However, with the transformation of educational ideas and talent training programs, China has begun to pay more and more attention to the evaluation of teaching quality. Now many colleges and universities have begun to use online evaluation of teaching, and Tsinghua University, Peking University, and other colleges and universities have done better. They have different evaluation indicators for different disciplines. The evaluation subjects include supervisors, colleagues, students, and teachers' self-evaluation. What a university does better is that students can evaluate teachers online at any time, which is equivalent to being effective for the whole semester. It can enable teachers to adjust their teaching methods in time and improve students' interest in learning. Some researchers

have come up with the idea of creating a multilevel fuzzy assessment of teacher teaching quality and have developed an assessment model to measure good teachers as measured. The practical application shows that the evaluation model is reasonable and effective; we introduce the teaching quality evaluation system into higher vocational schools [6]. There are many other similar related studies, which prove that more and more attention has been paid to teaching quality, and the application value of fuzzy theory in teaching quality evaluation has been favored by more and more people. Many studies show that fuzzy theory plays a relatively effective and reasonable evaluation in the application of teaching quality evaluation system [7]. Compared with traditional teaching, the advantages of fuzzy theory can give full play to the guiding and motivating functions of evaluation, and prompting educators to correctly recognize their own shortcomings and deficiencies, and actively find ways to improve, so as to rapidly improve the teaching level and teaching quality.

3. Intuitionistic Fuzzy Set Theory

Because intuitionistic fuzzy set is proposed on the basis of fuzzy set, it is necessary to understand the concept of fuzzy set first.

Definition 1

$$X = (x_1, x_2, \dots, x_n). \quad (1)$$

If the above formula is set as a nonempty set, it is called

$$A = \{\langle x, \mu_A(x) \rangle | x \in X\}. \quad (2)$$

The above formula is a fuzzy set, where $\mu_A(x)$ is the membership degree of element x in X belonging to A , that is,

$$\mu_A: X \longrightarrow [0, 1], 0 \leq \mu_A(x) \leq 1, \forall x \in X. \quad (3)$$

Intuitionistic fuzzy sets not only describe the ownership of content but also express affiliation. Compared with traditional fuzzy sets, intuitionistic fuzzy sets are more in line with the decision-making thinking behaviors of affirmation, negation, and hesitation in product evaluation and are more flexible and practical in dealing with fuzziness and uncertainty.

Definition 2. If formula (1) is also set as a nonempty set, it is called

$$A = \{\langle x, \mu_A(x), \nu_A(x) \rangle | x \in X\}. \quad (4)$$

It is an intuitionistic fuzzy set, where $\mu_A(x)$, $\nu_A(x)$ is the membership degree and nonmembership degree of element x in X belonging to A , namely,

$$\nu_A: X \longrightarrow [0, 1], 0 \leq \mu_A(x) + \nu_A(x) \leq 1, \forall x \in X. \quad (5)$$

In addition,

$$\pi(x) = 1 - \mu_A(x) - \nu_A(x), \forall x \in X, \quad (6)$$

where the above formula represents the hesitation or uncertainty that element x in X belongs to A . In particular, if the following formula is satisfied

$$\pi(x) = 1 - \mu_A(x) - \nu_A(x) = 0, \forall x \in X, \quad (7)$$

then A degenerates to Zadeh's fuzzy set. It can be seen from the above points that the membership degree in the fuzzy process and the unregistered membership degree are almost not independent of each other directly, and the only thing needed is that the balance between the two should not be greater. Below is an example to illustrate the special concept of intuitionistic blur lighting and set up as follows:

$$A = \{\langle x_1, 0.3, 0.4 \rangle, \langle x_2, 0.9, 0.1 \rangle, \langle x_3, 0.6, 0.2 \rangle\}. \quad (8)$$

If the above formula is an intuitionistic fuzzy set on set $X_0 = \{x_1, x_2, x_3\}$, it can be explained as follows: the membership degree of element x_1 belonging to A is 0.3, and the membership degree of element C not belonging to A is 0.4. Similarly, elements x_2 and x_3 can be explained.

For convenience, we call $\alpha = (\mu_a, \nu_a)$ intuitionistic fuzzy number where

$$\begin{aligned} \mu_a &\in [0, 1], \\ \nu_a &\in [0, 1], \\ \mu_a + \nu_a &\leq 1. \end{aligned} \quad (9)$$

It should be noted that the concept of intuitionistic fuzzy numbers has played an important role in promoting the development of intuitionistic fuzzy light theory, because the concept of intuitionistic fuzzy numbers has been introduced: blurred lights and a smoother way of thinking [8, 9].

For any intuitionistic fuzzy number, it can be evaluated by scoring function S :

$$S(\alpha) = \mu_a - \nu_a. \quad (10)$$

Among them, $S(\alpha)$ is the score value of α , $S(\alpha) \in [-1, 1]$. From the above formula, the score value of intuitionistic fuzzy number α is directly related to the difference between its membership μ_a and nonmembership ν_a ; that is, the greater the difference between μ_a and ν_a , the greater the score value of α and, thus, the greater the intuitionistic fuzzy number α .

Definition 3. set

$$\begin{cases} \alpha_1 = (\mu_{a_1}, \nu_{a_1}), \\ \alpha_2 = (\mu_{a_2}, \nu_{a_2}). \end{cases} \quad (11)$$

The above formula is any two intuitionistic fuzzy numbers.

$$\begin{cases} S(\alpha_1) = \mu_{a_1} - \nu_{a_1}, \\ S(\alpha_2) = \mu_{a_2} - \nu_{a_2}. \end{cases} \quad (12)$$

The above formula is the score value of α_1 and α_2 , respectively,

$$\begin{cases} H(\alpha_1) = \mu_{a_1} + \nu_{a_1}, \\ H(\alpha_2) = \mu_{a_2} + \nu_{a_2}. \end{cases} \quad (13)$$

The above formula is the accuracy of α_1 and α_2 , respectively.

If $S(\alpha_1) < S(\alpha_2)$, then $\alpha_1 < \alpha_2$, then $\alpha_1 < \alpha_2$, then $\alpha_1 < \alpha_2$; if $S(\alpha_1) > S(\alpha_2)$, then $\alpha_1 > \alpha_2$, then $\alpha_1 > \alpha_2$; if $S(\alpha_1) = S(\alpha_2)$, then $\alpha_1 = \alpha_2$.

Definition 4. set

$$\begin{cases} \alpha = (\mu_a, \nu_a), \\ \alpha_1 = (\mu_{a_1}, \nu_{a_1}), \\ \alpha_2 = (\mu_{a_2}, \nu_{a_2}). \end{cases} \quad (14)$$

If the above formula is any three intuitionistic fuzzy numbers, $\lambda > 0$, the operation rules of intuitionistic fuzzy numbers can be defined as follows:

$$\begin{aligned} \alpha_1 \oplus \alpha_2 &= (\mu_{\alpha_1} + \mu_{\alpha_2} - \mu_{\alpha_1} \cdot \mu_{\alpha_2}, \nu_{\alpha_1} \cdot \nu_{\alpha_2}), \\ \alpha_1 \otimes \alpha_2 &= (\mu_{\alpha_1} \cdot \mu_{\alpha_2}, \nu_{\alpha_1} + \nu_{\alpha_2} - \nu_{\alpha_1} \cdot \nu_{\alpha_2}), \\ \lambda \alpha &= (1 - (1 - \mu_{\alpha})^\lambda, \nu_{\alpha}^\lambda), \\ \alpha^\lambda &= (\mu_{\alpha}^\lambda, 1 - (1 - \nu_{\alpha})^\lambda). \end{aligned} \quad (15)$$

In principle, the determination method of location weight is similar to that of index weight. The appropriate method can be selected according to the characteristics and needs of actual management decision-making problems [10, 11]. For example, in order to remove the influence of the maximum and minimum values, the position weight can be the scoring method often used in reality to remove the highest score and lowest score. Specifically, a new weight measurement method based on traditional distribution is available. The feature of this method is to assign a smaller weight to the data that is too high or too low, so as to remove the interference of the data with large differences in the integration results as much as possible [12, 13]. But this approach has some drawbacks in that the weights are independent of the data being assembled and cannot affect the relationship between the data.

4. Teaching Quality Evaluation Method Based on Fuzzy Theory

4.1. Design of Teaching Quality Evaluation Model. The establishment standard of teaching quality evaluation model should first pay attention to the omni-directional and multidimensional evaluation of teachers. The evaluation participants include students, teachers, and supervision departments. Among them, students are responsible for evaluating teachers' teaching ability, creative thinking, and teaching effect during school. Teachers conduct self-evaluation on their teaching attitude, self-improvement, and curriculum teaching effect, while supervisors evaluate teachers' teaching consciousness, teaching standardization, and innovation [14, 15]. The relationship between the three is shown in Figure 1.

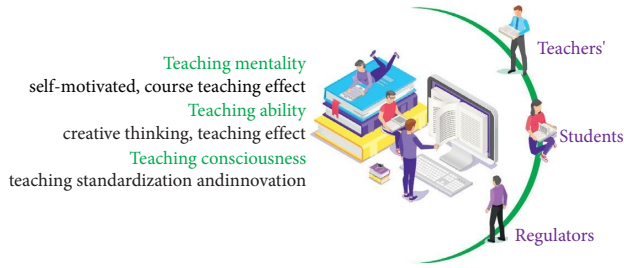


FIGURE 1: Relationship between subjects of teaching quality evaluation.

According to the above relationship, we have established the model of teaching quality evaluation system, as shown in Figure 2.

For the above teaching quality evaluation model, we divide the work links into parts, namely, system management, curriculum management, homework management, evaluation system management, evaluation management, and statistical analysis. According to the demand analysis of the above users, we establish the relationship diagram between users. The functional requirements among system administrators, teachers, students, and teaching supervisors are shown in the figure. The user login system activity diagram, user online evaluation activity diagram, and user query result activity diagram are shown in Figures 3–5. The effect is shown in Figure 6.

4.2. Teaching Quality Evaluation Process. With the need for quality assessment instructional evaluation and design, the evaluation process for all quality instructional assessments is to inform the curriculum, formulate the evaluation standard of the course homework, group the students in the class, and evaluate them according to the homework scores of the team members, including team members' self-evaluation, intergroup evaluation, and intragroup evaluation. According to the evaluation results of the three, we compare the teachers' evaluation of their homework, calculate the credibility of students' evaluation, and finally calculate the final evaluation score of teachers' teaching quality through fuzzy comprehensive evaluation method according to teachers' self-evaluation, supervision evaluation, peer evaluation, and students' evaluation, combined with the credibility of students' evaluation [16, 17]. The process is shown in Figure 7.

4.3. Database Design of Teaching Quality Evaluation System. Database design is to create a good database in the application environment and create data relationships and

applications to store and manage data to meet the various application needs of different users. The teaching quality evaluation system designed in this paper is used as the database management system. Through the analysis of the system and its functional requirements, the main designed data items are as follows [18, 19]:

Student information: name, student number, group, password, and class.

Teacher information: name, job number, professional title, password, and courses taught.

Information of teaching leaders: name, number, password, position, or professional title.

Administrator information: name and password.

Some data tables and fields are shown in Tables 1–10.

4.4. Evaluation and Analysis of the Teaching Quality Evaluation Model

4.4.1. Determine the Evaluation Index System and Comment Set. Taking computer graphics theory course as an example, its teaching evaluation index set is shown in Table 11.

The contents can also be adjusted according to the actual application effect feedback [20, 21]. The following Table 12 shows a teaching quality evaluation information base transferred out of the system, which is the scores of supervisors, peers, and students for teachers in terms of teaching attitude, teaching content, teaching art, classroom structure, classroom management, and teaching effect. Taking into account the importance of students' roles, the credibility of students' divided team leaders, team members, and class representatives in different roles is calculated [22, 23].

The final classroom teaching score of the teacher is obtained through two-level fuzzy comprehensive evaluation. From the above scores, the evaluation matrix of classroom teaching fuzzy relationship is obtained as follows:

$$R = \begin{pmatrix} 0.20 & 0.19 & 0.50 & 0.11 & 0 \\ 0.24 & 0.24 & 0.41 & 0.11 & 0 \\ 0.20 & 0.18 & 0.51 & 0.11 & 0 \\ 0.19 & 0.25 & 0.46 & 0.10 & 0 \\ 0.25 & 0.15 & 0.50 & 0.10 & 0 \\ 0.19 & 0.66 & 0.05 & 0.10 & 0 \end{pmatrix}. \quad (16)$$

And the weight vector of each index of classroom teaching is as follows:

$$B = A \circ R = (0.1 \ 0.25 \ 0.15 \ 0.15 \ 0.1 \ 0.25) \circ \begin{pmatrix} 0.20 & 0.19 & 0.50 & 0.11 & 0 \\ 0.24 & 0.24 & 0.41 & 0.11 & 0 \\ 0.20 & 0.18 & 0.51 & 0.11 & 0 \\ 0.19 & 0.25 & 0.46 & 0.10 & 0 \\ 0.25 & 0.15 & 0.50 & 0.10 & 0 \\ 0.19 & 0.66 & 0.05 & 0.10 & 0 \end{pmatrix}. \quad (17)$$

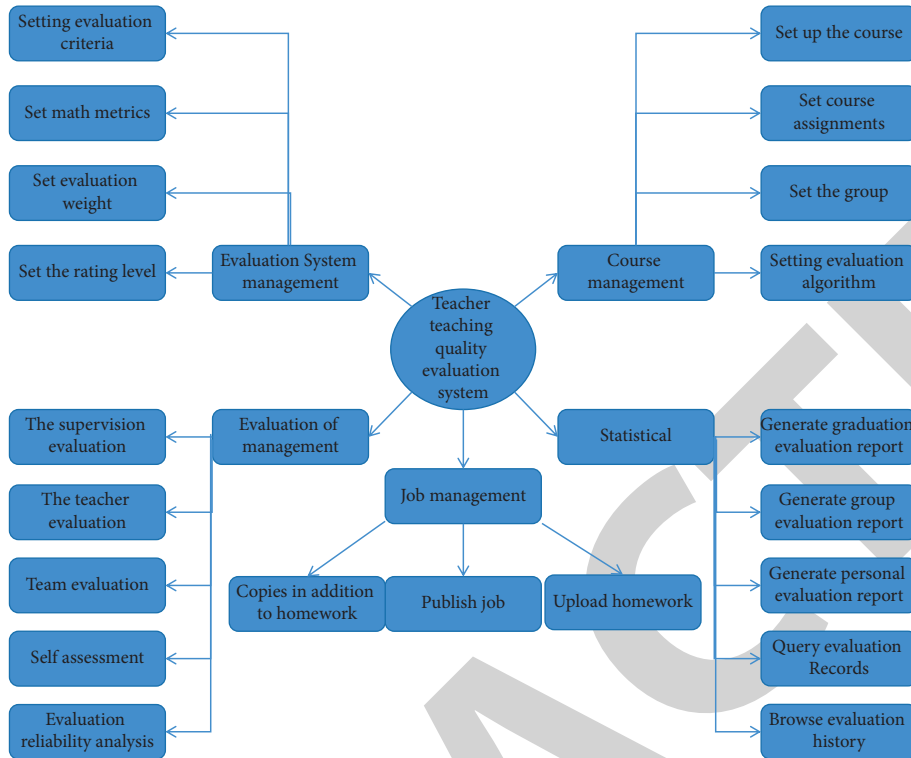


FIGURE 2: Model of teaching quality evaluation system.

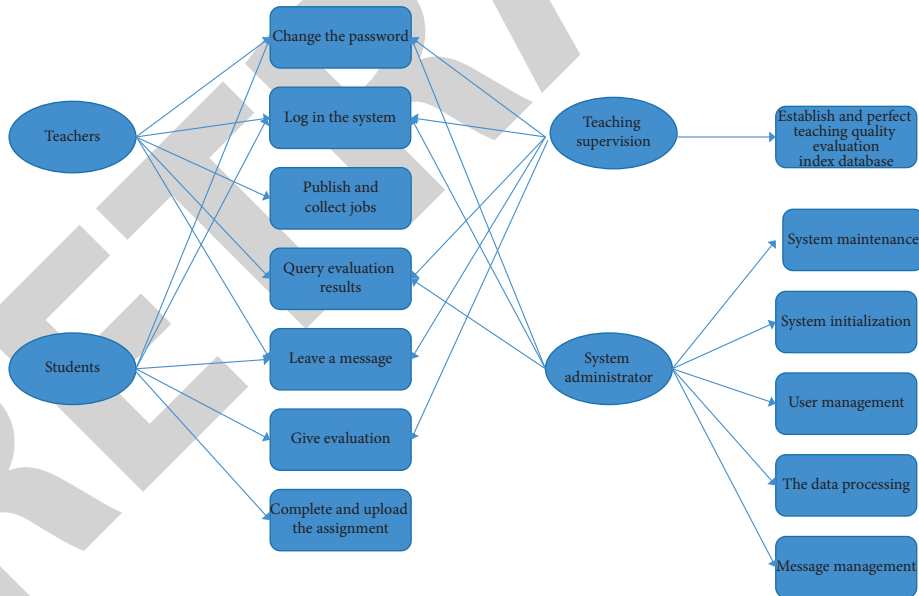


FIGURE 3: User function diagram.

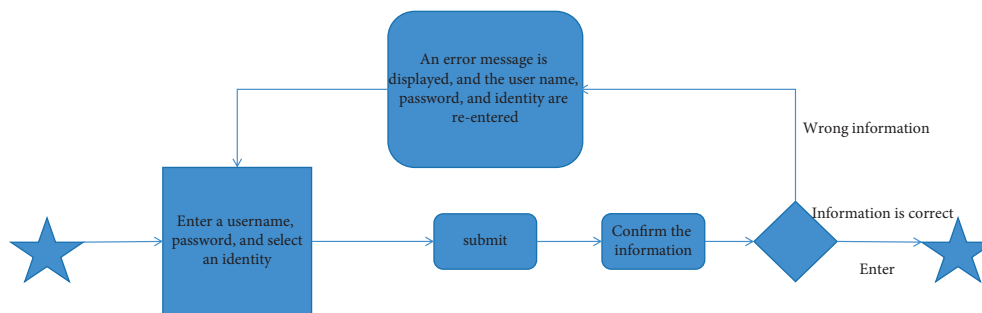


FIGURE 4: User login system activity diagram.

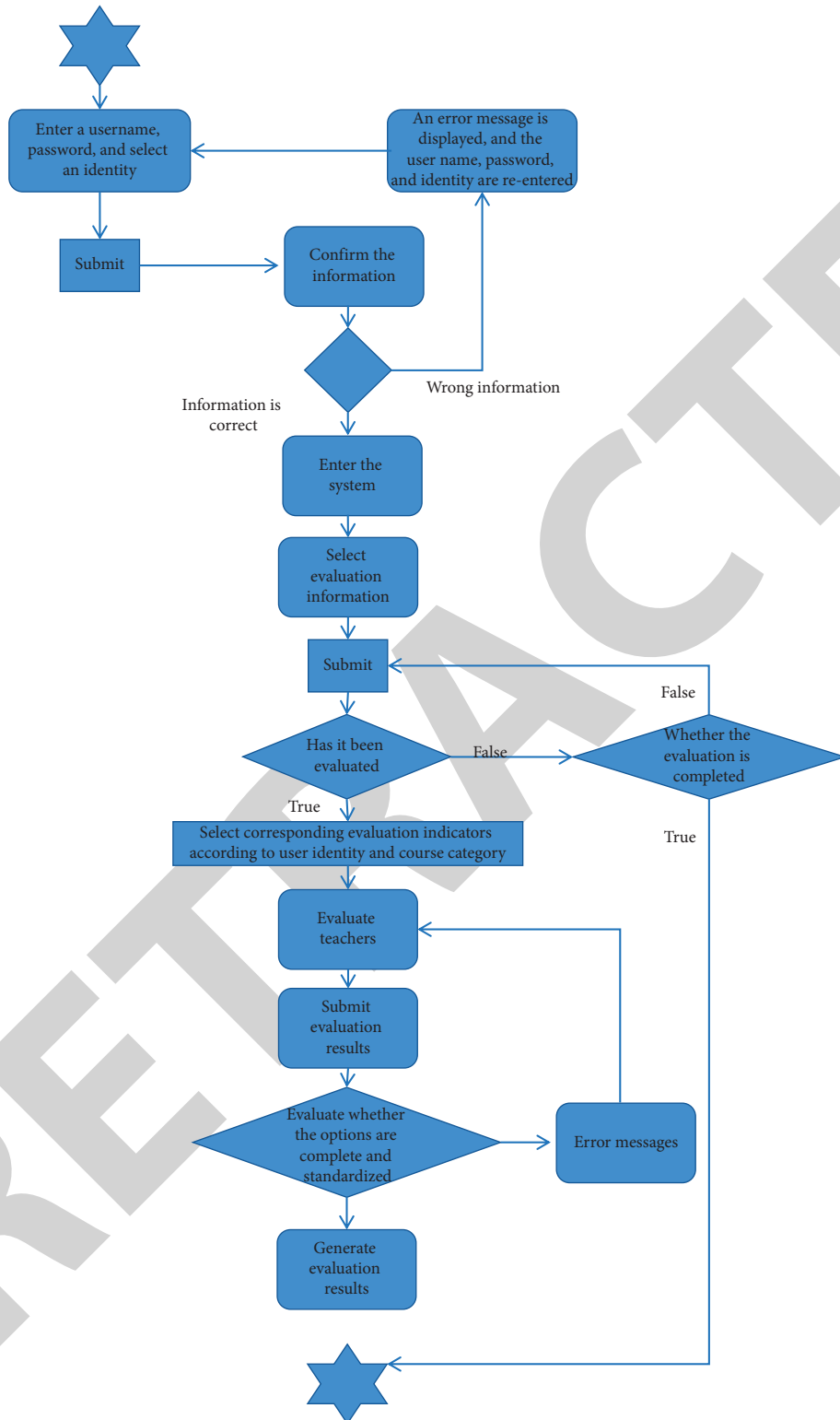


FIGURE 5: User online evaluation activity diagram.

The references here assume that the weights of each index are 0.1, 0.25, 0.15, 0.15, 0.1, and 0.25, respectively. If the weighted average is used, it can be obtained through the above evaluation method $B = (0.211, 0.3235, 0.3605, 0.105, 0)$:

$$S = (0.211, 0.3235, 0.3605, 0.105, 0) \begin{pmatrix} 95 \\ 85 \\ 75 \\ 65 \\ 35 \end{pmatrix} = 81.405. \quad (18)$$

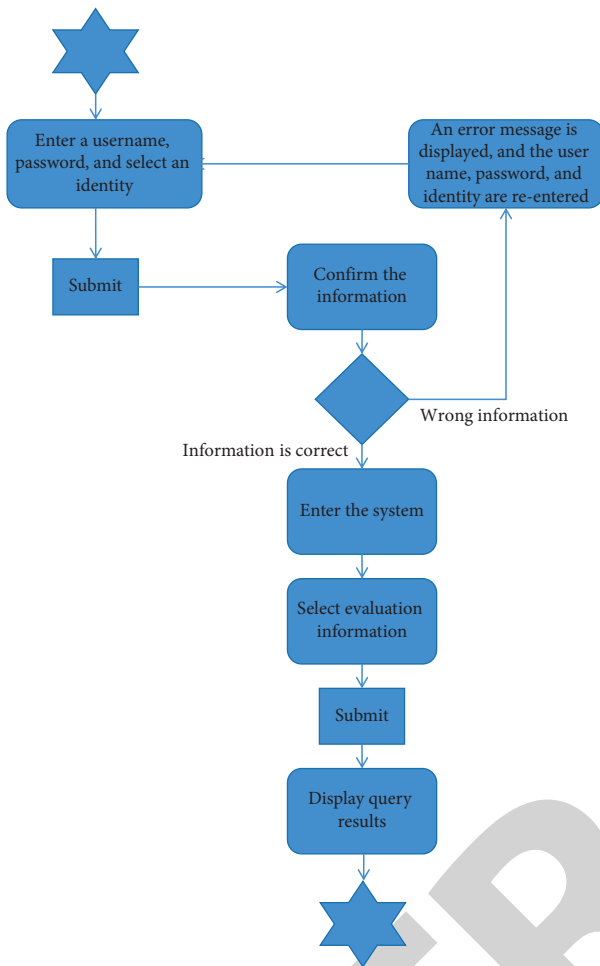


FIGURE 6: Activity diagram of user query and evaluation results.

According to the above results, the teacher's evaluation result score is 81.45. This score is an evaluation result obtained by using the fuzzy comprehensive evaluation algorithm, which is an algebraic value from 0 to 100. The higher the score, the better the quality of classroom teaching. The teacher evaluation result score is 81.405, and the score is between 80 and 90, and the teacher's classroom evaluation result is good [24, 25].

5. Implementation of Teaching Quality Evaluation System Based on Intuitionistic Fuzzy Theory

5.1. Overview of Teaching Quality Evaluation. The quality of education and teaching determines the quality of the whole school and is the foundation of the whole school. Many schools now pay more attention to the importance of teaching assessment and teaching strategies, and conduct teaching assessments in accordance with teaching guidelines every day. However, at present, the teaching quality evaluation of many college teachers is generally composed of student evaluation, teacher evaluation, leadership evaluation, and so on. Student evaluation is mainly the result evaluation of teachers by students at the end of a semester;

teacher evaluation is a self-evaluation of the courses given by teachers at the end of the term, which exists in many colleges and universities; and leadership evaluation is generally a general scoring evaluation conducted by the supervisor or the leader in charge of teaching at the end of the term [26, 27]. There are some problems in the above evaluation method, such as nonprocess, only paying attention to the results, one-sided, and relatively subjective. It is possible that the final examination results account for a large proportion. Students' evaluation of teachers may also have great subjective emotions, which is difficult to really take into account the performance of teachers in the whole teaching process. The whole evaluation process is difficult to be fair and impartial, lack of persuasion, and lack of credibility. For example, the adult technical secondary school in Luqiao District, a province where the school is located (hereinafter referred to as CRZZ) currently adopts the combination of supervision, door-to-door listening evaluation, and student evaluation as an overall evaluation of teachers' teaching quality. As the supervisor is also responsible for teaching, the number of lectures is very limited, and students grade the teachers anonymously on the teacher evaluation form uniformly distributed by the academic affairs office near the end of the term. The final result is that each teacher's score will be the same, which does not have much substantive help to improve the quality of teaching. However, the link of students' scoring is not only a waste of paper but also a mere formality.

According to the survey, the current teaching quality evaluation has the following characteristics:

- (1) The way of teaching evaluation is mainly to evaluate teachers, emphasizing that teachers are the center of teaching activities.
- (2) The evaluation of teaching effect is based on how much knowledge students master, emphasizing students' knowledge memory.
- (3) The evaluation of teaching process is mainly based on the dissemination of teachers' knowledge. This oral teaching method has affected students' self-learning ability.
- (4) Students' midterm or final grades account for the main proportion of teachers' evaluation composition. Teachers may pay more attention to examination than quality, ignoring the artistry, and interest of ordinary classroom teaching.
- (5) In the teaching dominated by this evaluation, the teaching society emphasizes teaching as the goal, and the one-way transmission of teaching methods is difficult to improve the teaching level.

In order to make the evaluation objective and fair, the key is to promote the improvement of teaching evaluation feedback on teachers' daily teaching. Through the communication and analysis with the relevant personnel of the academic affairs office and the supervision office, combined with the daily teaching management work and relevant business processes, this paper analyzes and demonstrates the teaching quality evaluation management system, and makes

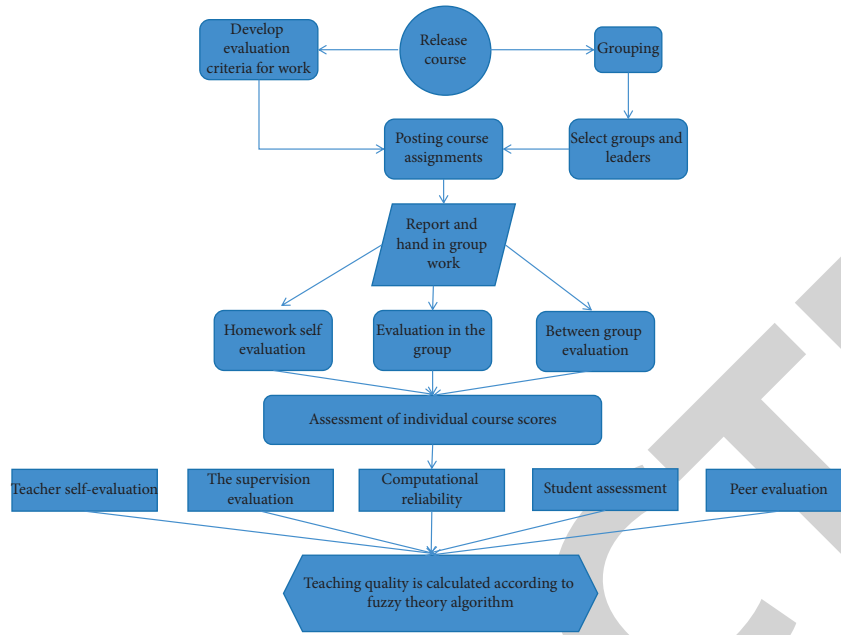


FIGURE 7: Evaluation process design.

TABLE 1: Class table.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
Name	Varchar	Class name

TABLE 2: Course schedule.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
Name	Varchar	Name of training course
Teacher	Varchar	Name of trainer
Description	Varchar	Training course description

TABLE 3: Class allocation.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
Name	Varchar	Term name (in this format: CCNA Cisco 201207)
Course_name	Varchar	Course name (e.g., CCNA)
Class_name	Varchar	Class name (e.g., network 201207)

TABLE 4: Group table.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
Name	Varchar	Course name
Number	Int	Number of groups

TABLE 5: Detailed allocation of groups.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
Student name	Varchar	Student name
Group leader	Varchar	Yes/no team leader
Group name	Varchar	For example, 1 means the first group
Course class	Varchar	Class courses

TABLE 6: Evaluation index of course performance.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
First quota_id	Int	Primary indicator ID
Second quota_id	Int	Secondary indicator ID
Description	Text	Evaluation index description

TABLE 7: Primary indicators of achievement evaluation.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
First quota	Varchar	Index level 1 name
Description	Text	Evaluation index description

TABLE 8: Secondary indicators of performance evaluation.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
First quota_id	Int	Primary indicators
Second quota	Varchar	Secondary indicator name
Description	Text	Evaluation index description

it clear that the teaching quality evaluation system is mainly used to deal with the evaluation indicators, evaluation courses, evaluation algorithms, evaluation weights, and their interrelated information in the teaching quality management; its main goal is to improve the efficiency and quality of

teaching quality supervision. It is hoped that the system software can help the relevant management staff to sort out, find and modify the information of teaching quality management more conveniently and quickly, simplify the

TABLE 9: Operation table.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
Name	Varchar	Course assignment name
Announcement_id	Int	Evaluation forms to be applied by the ancestral industry
File	Varchar	Packaged course assignment file (format named assignment x)
Description	Text	Job description

TABLE 10: Weight setting of teaching quality.

Field name	Type	Remarks
ID	Int	Auto-increment and primary key
Supervisor_id	Int	Supervision number
Colleague_id	Int	Peer number
Teacher_id	Int	Teacher number
Student_id	Int	Student number
Trust value	Int	Credibility of student evaluation

TABLE 11: Teaching evaluation index set.

Subject: computer graphics		Score
Primary index	Secondary index	
Teaching attitude (10 points)	Carefully prepare before class, go to and from class on time, and do not leave the computer room without authorization (5 points).	
	Love students, treat students equally, help students with poor foundation, and do not corporal punishment or corporal punishment in disguise (5 points).	
Teaching content (40 points)	The teaching focus is prominent, and the difficulty is appropriate (20 points).	
	Integrate theory with practice and have a scientific outlook on development and innovation (10 points).	
Teaching art (10 points)	Assign homework according to requirements, with appropriate amount of homework and timely correction. Students are not assigned to correct homework and test papers (10 points).	
	Use a variety of teaching means, such as grouping, so that students can learn independently, cooperatively, exchange, and explore (10 points).	
Classroom structure (20 points)	The classroom structure is reasonable, including introduction, review, teaching of new knowledge, and creation of lazy environment (20 points).	
Classroom management (5 points)	Pay attention to classroom discipline and properly deal with emergencies (5 points).	
Teaching effect (15 points)	Standardized teaching, rigorous knowledge, and clear organization can mobilize students' enthusiasm and seriously answer students' questions without chaos (10 points).	
	If students' wrong words and deeds are found in the teaching process, they can be stopped and educated in time, so as to teach and educate people.	

TABLE 12: Teaching quality evaluation database.

Evaluate	Teaching attitude	Content of courses	Teaching art	Classroom structure	Classroom management	Teaching effectiveness	Evaluation type	Student role	Evaluation credibility
001	60	60	60	60	60	60	Student	Team leader	0.8
002	70	70	70	80	70	80	Supervise		1.0
003	90	90	90	90	90	90	Peer		0.8
004	70	80	70	70	70	70	Student	Team members	0.7
005	80	80	80	70	80	80	Student	Team members	0.5
006	80	70	80	70	80	80	Student	Team leader	0.6
007	90	90	90	80	90	90	Own		0.5
008	80	90	80	90	90	80	Student	Team members	0.2
009	70	80	70	70	70	80	Student	Team members	0.8
010	70	70	70	70	70	80	Student	Team leader	0.9

cumbersome workflow as much as possible, and make it more convenient for the relevant departments to master the real-time teaching quality of school teachers and other necessary functions [28]. The teaching management department can conveniently and quickly understand the teaching quality of each teacher through this system, and timely grasp the dynamic teaching quality information of management teachers.

5.2. Demand Analysis of Teaching Quality Evaluation. The purpose of schools or education departments using this teaching evaluation model and method is to reform teaching and improve school teaching quality. However, the teaching work is not invariable. Each major and each course have its own characteristics. The evaluation methods and models should be diversified and multilevel. Therefore, it is difficult to establish a unified teaching evaluation model. It is necessary to add evaluation factors and the relationship between various factors to the evaluation model, so as to truly establish a more scientific and reasonable teaching quality evaluation system. By describing the problems of quality teaching evaluation, we found that there are some problems in the current quality teaching evaluation, even in terms of methods, or what is the meaning of special evaluation, such as the content and nature of evaluation, which is objective, nonprocess, reliability assessment, etc. These factors play a direct role in the final evaluation of teaching quality. Based on the above analysis, this paper believes that teaching evaluation and development evaluation should include the following points:

5.2.1. Evaluation of Subject Management. Teaching evaluation is a complex composed of teaching departments, supervision departments, colleagues, and students. Therefore, the established evaluation mechanism and evaluation system must include these subjects. Moreover, students should be the main body of this evaluation, because the ultimate purpose of setting evaluation is to promote teaching with evaluation, better improve teaching, and serve students. Just teaching students interest and gain is a great and wonderful teaching. In addition, students are an integral part of a teacher's entire teaching process, and their foundation is the largest and most inspiring. In order to be fair and objective in the assessment of results, these points must be addressed, and each subject must have its own rules to govern and operate.

5.2.2. Teaching Index System. From the research point of view, each class has its own characteristics, so the instruction should not be revised, but should have the opportunity to change and set different indicators according to the different characteristics of different classes, so that the system can be researched, appropriate, and exchangeable changes. Data-driven teaching measures to ensure research into the quality of teaching in each class. According to the different characteristics of intermediate practice, different indicators are set for basic courses and advanced courses, theory courses,

and practice, without mentioning their characteristics. In the design of measures, the perspectives of teachers and students should be considered and combined with the guidance of peers and professional peers.

5.2.3. Online Evaluation. With the popularization of computer technology and network technology, the traditional way has restricted the work of evaluation to a great extent, especially for teaching departments and teachers, and the use of online evaluation is very useful to improve work efficiency.

5.2.4. Evaluation Data Analysis. The teaching evaluation index calculates the results of teaching evaluation through the evaluation algorithm. The calculation results are required to be scientific and clear at a glance, and can be compared vertically and horizontally, which is convenient for teachers to query and effectively penetrate into the teaching process. In this process, we can see that the establishment of a reasonable teaching evaluation index system and the use of scientific evaluation algorithms are two important parts of the teaching evaluation system. Many important evaluation records will be produced in the evaluation process. How to preserve and analyze these records is an important data source of evaluation, so it should be used scientifically.

According to the actual characteristics of the above analysis and quality assessment, it has the following three functions:

- (1) Information feedback function: it is feedback of the actual reflection of students on teachers' teaching to teachers so that teachers can adjust teaching methods in time, which also plays a learning strengthening role.
- (2) Convenient management function: it is convenient for the school to supervise teachers, judge the advantages and disadvantages of teachers' teaching, and use it as a reference for professional title evaluation or excellence evaluation, so as to manage the teaching team more scientifically and reasonably.
- (3) Guiding function: the evaluation index formulated is the teaching goal, guiding teachers and students to work toward the goal.

5.3. Evaluation Index. The measurement of teaching quality is an important factor affecting the evaluation of teaching quality. Due to the diversity of curriculum in different disciplines, many scholars have discussed the development of teaching quality standards in colleges and universities. The indicators we use are basically subjective evaluation, such as the evaluation of supervisors through lectures and student interviews, the self-evaluation of teachers, and the evaluation of peers. The frequency of these three subjects participating in teaching evaluation is very low. The teaching supervisor may listen to this course once a semester. The teachers often give themselves a better evaluation. Some of their peers have interpersonal relationships or participate in lectures very few times, so the evaluation results of these

three subjects are very subjective. Students participate in the whole process of teachers' teaching, and their evaluation is very important. Therefore, at present, students' evaluation is basically the main factor. However, students' evaluation is only a result evaluation, which does not really reflect the teaching process. This paper holds that the effect of teaching quality depends on the evaluation of the teaching process, but it is not feasible for these subjects to complete it. Therefore, we need to establish a process evaluation of the curriculum, which is generated by the evaluation among teachers, team leaders, and team members. The curriculum of teachers is divided into several chapters or projects, and the learning effect of each chapter or project is investigated by publishing assignments. This effect is composed of four parts: the teacher's evaluation of the group, the evaluation between the groups, the internal evaluation of the group, and the self-evaluation of the members. These evaluation records are used to evaluate the chapter or project performance of each student, so as to reflect the credibility of the student evaluation. This credibility is measured by the distinction between the final performance of the students and the performance of self-evaluation. Therefore, we use the credibility of students as an important index to evaluate the quality of teaching. The credibility of student evaluation is composed of teachers, team leaders, team members, and their own subjects. The description is shown in Figure 8.

5.4. Overall Framework of Teaching Quality System. Effective instructional assessment plays an important role in teacher development, educator understanding and self-awareness, teacher effectiveness assessment, and school leaders' understanding of outstanding teachers. Appropriate and appropriate instructional assessments can identify teachers' strengths and weaknesses; ensure teachers use the program to provide timely guidance, research, and assistance for student development; and also keep educators aware of their own applications. *Teaching and Learning*. It emphasizes the role of assessment in supporting, monitoring, and facilitating teaching and undercuts the selection and operation of indicators. Regarding the ultimate goal, the purpose of assessment is to promote the development and well-being of all students, to support students' ability to identify and solve problems, to promote students' citizenship and free economy, and ultimately to allow students to "learn, learn to live, and learn to be." However, the current evaluation system of teaching quality is not very scientific and systematic. In addition to the achievement as a quantitative and objective evaluation index, other evaluations, such as moral education, independence, creativity, and so on, are not perfect. Establishing a scientific and reasonable teaching quality evaluation system and using information means to ensure the implementation of the evaluation system is an effective way to solve these problems. Figure 9 shows the overall structure of CRZZ teaching quality evaluation system.

In the teaching quality evaluation system designed in this scheme, the participants include teachers, students, and school supervision departments, and the evaluation

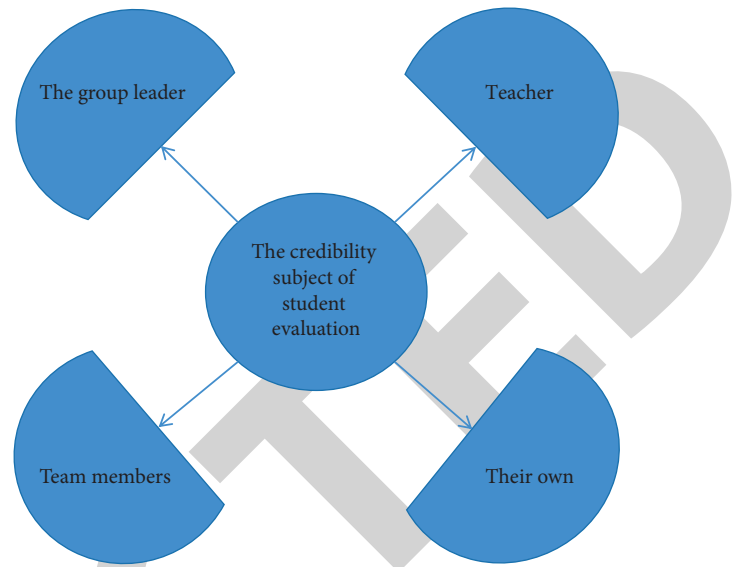


FIGURE 8: Student evaluation credibility subject.

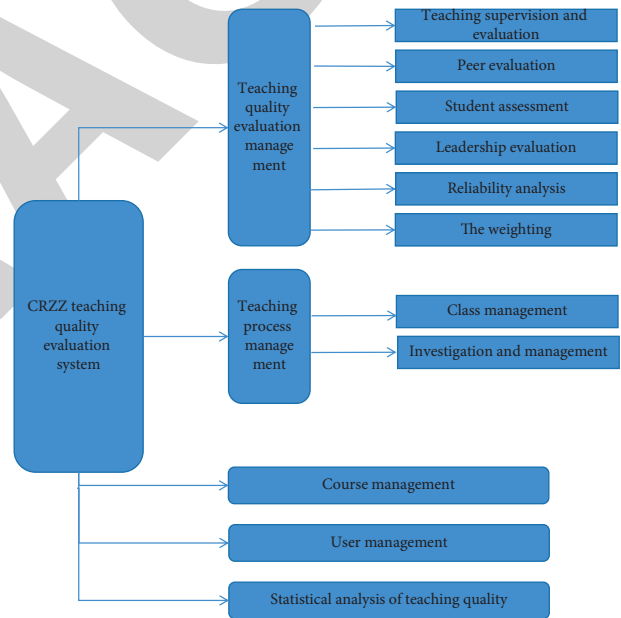


FIGURE 9: Overall structure of CRZZ teaching quality evaluation system.

objectives include two categories: curriculum evaluation and comprehensive evaluation. Curriculum evaluation is used to analyze the teaching quality in the teaching process. The credibility of student evaluation is analyzed through the evaluation of teaching and students in a semester, and the credibility is taken as an index of comprehensive evaluation. Comprehensive evaluation is a good and effective evaluation of all the good qualities of teachers, that is, evaluation of good teachers.

5.5. Implementation of Curriculum Evaluation Module. This module sets the evaluation indicators of each subject. According to the characteristics of different courses,

TABLE 13: Evaluation criteria.

Evaluating indicator	Evaluation content	Score
Ideological nature	The theme is clear, and the content is positive and healthy	15
Technical	Proficiency in using tools	10
	Flexible use of materials	10
	Use of special effects	10
Creativity	Originality	10
	The theme expression is novel and ingenious	10
	Imaginative and expressive	10
Artistry	The overall artistic effect of the work	15
Self-scoring	How many points do you think you can get	10

different evaluation index systems can be set up. First, we access the login interface of the system and use a combination of multiple indicators and descriptive indicators in the class test. For example, the evaluation criteria of computer drawing works are shown in Table 13.

According to the different characteristics of teachers of different majors, the evaluation indexes of their moral quality, teacher literacy, teaching attitude and ability, communication and cooperation ability, innovation, and practice are set, respectively. This module takes computer graphics course as an example to set up the evaluation index of teachers' comprehensive quality. We use the fuzzy evaluation algorithm in the previous chapter to calculate the final teaching quality effect of the teacher in the course, which is expressed by the grades of excellent, good, medium, pass, and fail. The system is equipped with the evaluation result query function. We click the corresponding button to pop up the evaluation result query page.

6. Conclusion

Because they consider the information of membership, nonmembership, and hesitation at the same time, the previous ones can describe and describe the fuzzy nature of the objective world more delicately than traditional fuzzy sets. On the basis of the previous research results, this paper conducts a systematic and in-depth study on the comprehensive evaluation problem in the intuitionistic fuzzy environment and proposes some new integration theories and methods in the aspects of intuitionistic fuzzy information integration, information measurement, interactive group evaluation, etc. *Evaluation method*. With the help of the intuitionistic fuzzy information integration algorithm method, the intuitionistic fuzzy-weighted average operator and the normal distribution weighting method are mainly used to construct the evaluation model of student education and teaching management quality, and the teaching quality evaluation system based on intuitionistic fuzzy theory is developed. Resulting in a teacher evaluation result score is 81.45, which is an algebraic value from 0 to 100, and the score is between 80 and 90. The teaching quality evaluation system based on the intuitionistic fuzzy-weighted average operator and the normal distribution weighting method can not only find various problems existing in the teaching process of teachers, help the teaching management department to evaluate teachers, but also help to detect the

unsatisfactory teaching quality. We trust the evaluation subject and improve the quality of evaluation, thereby improving the overall teaching quality of the school.

Data Availability

The labeled dataset used to support the findings of this study is available from the author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

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