Design and Application of Evaluation Method for Civics Classroom Based on CRITIC Fuzzy Algorithm

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Abstract

INTRODUCTION: Through in-depth study of Civics classroom evaluation, it can provide teachers with scientific evaluation indexes and methods, improve teaching quality and effect, promote the overall development of students, and also promote the professional growth of teachers.

OBJECTIVES: Based on critical and fuzzy comprehensive evaluation methods, this study aims to study the effectiveness and accuracy of the evaluation methods in Civics and Politics classrooms. Based on the CRITIC method, the fuzzy comprehensive evaluation method was introduced to solve the problem of subjectivity and uncertainty in the evaluation process.

METHODS: Various research methods were used, including observation, interviews, and questionnaires. By comprehensively analyzing the students' performance, feedback, and assessment, and the teachers' pre-course preparation, the advantages and improvement directions of Civics classroom teaching can be accurately evaluated using the CRITIC and fuzzy comprehensive evaluation methods.

RESULTS: The study results show that the CRITIC and fuzzy comprehensive evaluation methods can provide a more comprehensive, accurate, and objective evaluation of the Civics classroom. The undefined complete evaluation method plays an essential role in dealing with ambiguity and uncertainty in the evaluation process, making the evaluation results more objective and reliable.

CONCLUSION: The Civics classroom evaluation method based on the CRITIC and fuzzy comprehensive evaluation methods is adequate and accurate. These findings strongly support improving the quality of Civics classroom teaching and enhancing students' learning outcomes.

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1 Introduction

As an essential discipline, Civics has a necessary impact on students' learning and thinking abilities. In Civics teaching, teachers' evaluation is indispensable in guiding students' learning attitudes and learning effects. Therefore, it is necessary to study the review of the Civics classroom to improve the teaching effect of the Civics classroom.

First, evaluating Civics and Politics classrooms is necessary for modern education reform. With the development of society and the progress of technology, the goal of education is no longer to impart knowledge but to cultivate students' comprehensive quality and ability[1-2]. Civic and political classroom evaluation, as a means of educational assessment, can help teachers

understand students' learning and discover students' problems and difficulties in time to guide better students' learning and development[3-4]; therefore, the study of Civic and Political Classroom Evaluation is of great significance to the educational reform and the improvement of teaching quality. Secondly, evaluating the Civics classroom can improve the teaching effect]. Through assessing students' performance in the Civics classroom, teachers can discover students' learning problems and difficulties in time and make targeted teaching adjustments and counseling guidance to help students better understand and master Civics knowledge and improve the learning effect. At the same time, by evaluating students' performance in Civics and Politics, teachers can find their teaching deficiencies, timely reflection and improve teaching, and improve the quality and level of education [7-8]. In addition, the study of Civics classroom evaluation can also promote the overall development of students. By evaluating students' performance in Civics, teachers can encourage students to realize their potential in Civics learning, cultivate students' self-confidence and independent learning ability, stimulate students' interest and enthusiasm in Civics learning, and help students find their deficiencies and room for improvement, thus promoting their self-development and growth[9-10]. In addition, the study of Civics classroom evaluation is also of great significance to teachers' professional development and growth [11-12]. Teachers need professional knowledge and skills when evaluating students' performance in Civics and have a deeper understanding of students' learning. Through the study of Civics classroom evaluation, teachers can improve their evaluation ability, better guide students' learning, and enhance their professional level.

In general, the background and significance of the study of Civics classroom evaluation are reflected in the need for educational reform, improvement of teaching effectiveness, promotion of students' overall development, and teachers' professional development. Through in-depth study of Civics and Politics classroom evaluation, teachers can be provided with scientific evaluation indexes and methods to improve the quality and effect of teaching and promote the overall development of students, as well as the professional growth of teachers.

In summary, Civics classroom evaluation is the teachers' assessment and feedback on students' performance in Civics learning. Civics classroom evaluation has become a popular research field for education reform and teaching quality improvement, and various evaluation methods and strategies are emerging[13-15]. Firstly, in the Civics and Political Science classroom evaluation, the traditional evaluation methods are gradually replaced by diversified evaluation methods, which mainly rely on test scores and answers to evaluate students' learning. However, this evaluation method needs to include the development of students' thinking processes and problem-solving abilities. Secondly, in the evaluation of the Civics classroom, personalized evaluation has gradually been valued. This evaluation method can help teachers better understand the learning situation of each student and carry out targeted teaching and counseling according to the different needs and abilities of students, which can not only help students discover their strengths and weaknesses and improve their Civics ability under the guidance of teachers in a targeted way. In addition, the development of technology has also brought new opportunities and challenges to the evaluation of the Civics classroom. With the development of e-education, various educational technologies and online learning platforms are widely used. These technologies can help teachers conduct Civics classroom evaluation more conveniently, collect and analyze students' learning data, and provide personalized feedback and guidance. At the same time, these technologies also give the teachers more evaluation tools and resources, such as online quizzes and learning analysis tools, which make the evaluation more accurate and comprehensive. However, the development of evaluation in the Civics classroom still faces some difficulties and challenges. First, the complexity of evaluation makes it necessary for teachers to have specialized evaluation knowledge and skills. Evaluation needs to consider subject knowledge, teaching philosophy, and students' characteristics, while teachers may face cognitive bias and subjective judgment in evaluation. Secondly, the use of assessment results and feedback is also a challenge. Evaluation results should be able to help students improve their learning and guide teachers to optimize their teaching, but how to effectively communicate evaluation results to students and teachers is a challenge.

In summary, the evaluation of the Civics classroom gradually tends to be diversified and personalized in its development. At the same time, it faces the challenges of evaluation complexity and usage problems. Future research should further explore effective evaluation methods and strategies. In this paper, considering the existence of cognitive bias and subjective judgment, the CRITIC method is used for evaluation analysis to propose relevant improvement strategies.

2 Evaluation Modeling of Civics Classroom Teaching

2.1 Establishment of an evaluation indicator system

In this paper, when choosing evaluation indicators, the Author consider that the evaluation indicators should match the learning objectives, first of all, the Author should make clear what students should achieve in Civics learning, such as Civics conceptual understanding, problem solving ability, problem solving ability, etc., and according to the learning objectives, the Author should choose evaluation indicators corresponding to them; the Author consider that the evaluation indicators should be able to comprehensively reflect the students' learning of Civics, development of Civics thinking, the process of solving problems accuracy, etc.; consider that the evaluation indicators should be able to be understood and

used by different teachers or evaluators, and have a specific quantitative ability for comparison and analysis; consider that the evaluation indicators should be able to be operated and recorded in the classroom; consider that the evaluation indicators should be able to be integrated with the teaching activities, so that it is easy for the teachers to observe and evaluate the students' learning. At the same time, evaluation indicators should also be easy for teachers to record and organize for subsequent evaluation and feedback.

Based on the consideration of the above factors and the research of related scholars[16], the evaluation index system of Civics teaching is constructed as shown in the following figure. The data used in this study mainly comes from primary function classroom teaching.
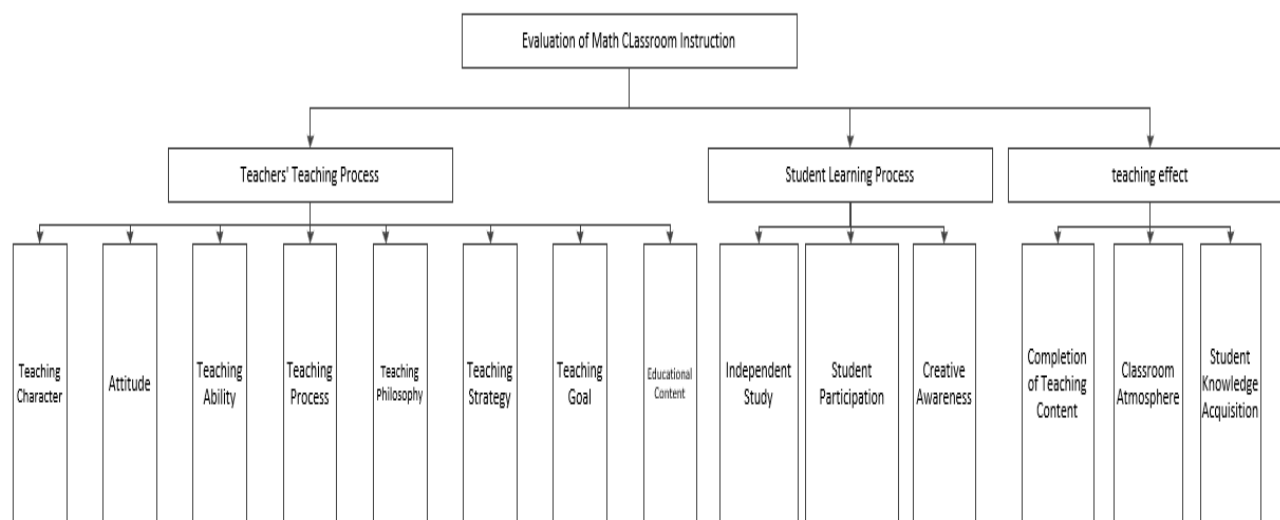

Figure 1 Evaluation indicator system

2.2 CRITIC-Fuzzy Comprehensive Evaluation Model
2.2.1 CRITIC method

First, the CRITIC method can be used to determine the weights of the indicators for evaluating the quality of teaching in the wisdom classroom. In evaluating Civics classroom teaching, the CRITIC method can determine the consequences of all hands.

The CRITIC method is a method used for evaluating and selecting technical solutions, which consists of the following elements[17] :

(1) Comparative evaluation: First, the objects to be evaluated are listed and compared according to different evaluation indicators. The evaluation indicators may include various aspects that need to be represented. Other technical programs are scored or ranked for each evaluation indicator to understand their performance on different hands.

(2) Ranking: The weights of the evaluation indicators can be adjusted according to needs and priorities to reflect their importance. Ranking can be done according to the comprehensive evaluation score or the weights of individual evaluation indicators. In this paper, the evaluation indicators of the Civics classroom can be ranked to observe the degree of importance in the whole evaluation system.

(3) Interactive evaluation: Discussions and interactions to learn more about the needs and opinions of people or groups related to the assessment subject. Stakeholders can provide their views, opinions, and preferences on the topic to be evaluated, which helps to synthesize their interests and needs. In this paper, the main focus is on the continuous improvement of students and teachers to achieve teaching and learning outcomes.

(4) Trade-off analysis: Finding the best solution for improvement by weighing the performance of the object to be evaluated on different evaluation indicators, which may involve trade-offs and trade-offs between various evaluation indicators to find the most suitable solution. This paper shows that it improves the quality of teaching and student learning in the Civics classroom.

(5) Integration: Review all evaluation results and opinions after weighing them. The Civics Classroom Enhancement Program can be selected to best meet the needs and goals by integrating the evaluation scores, considering stakeholders' views, and analyzing other factors. This paper aims to conduct Civics classroom enhancement based on this.

However, the CRITIC method may make obtaining accurate and complete data for specific evaluation indicators complex when information is incomplete. In the absence of critical data, evaluation results may be inaccurate and may introduce misleading conclusions. In addition, the CRITIC method involves multiple steps and consideration of various evaluation indicators and,

therefore, may require a high level of specialized knowledge and time costs, which may place specific demands on the assessor's capabilities and resources[18].

This paper argues that the CRITIC method can be widely used in the Civics classroom. For example, when students present their homework or problem-solving process, they can be evaluated for their participation and contribution through the contribution dimension. In classroom discussions, students' understanding and application of Civics knowledge can be assessed through relevance. In inquiry-based learning activities, the degree of students' interest in Civics and Politics can be evaluated through the interest dimension. In problem-solving, students' thinking and problem-solving ability can be assessed through the thinking degree dimension. In cooperative learning, students' performance in teamwork can be evaluated through the interpersonal competence dimension.

Specifically, the steps of the CRITIC method are as follows:

(1) Standardization of evaluation sample data

Sample data standardization refers to transforming raw data into standard, normally distributed data with specific means and standard deviations. Standardization allows variables of different scales, units, and ranges to be comparable for better data analysis and modeling.

In this paper, considering retaining the data distribution characteristics, reducing the impact of outliers, and facilitating the establishment of models, the following equation is used for standardization, and the standardized treatment is r_{ij}. The standardization process is as follows.

Standardized as follows:

$$r_{ij} = \frac{x_{ij} - min(x_j)}{max(x_j) - min(x_j)} \qquad (1)$$

Equation: $max(x_j)$ -Maximum value of sample single indicator data;

$min(x_j)$-Sample single-indicator data minimum.

(2) Contrast and Contradiction

The CRITIC method of weighting indicators is organized around contrast and contradiction.

Comparability: The standard deviation ofσ_j indicates the comparability of the *jth* indicator

$$\sigma_j = \sqrt{\frac{\sum_{i=1}^{m}(r_{ij} - r_j)}{m-1}} \qquad (2)$$

Contradiction: Contradiction reflects the degree of correlation between different indicators. If there is a significant positive correlation, the smaller the value of rejection. Let the size of the contradiction between indicator *j* and the rest of the indicators be

$$f_j = \sum_{i=1}^{m} 1 - q_{ij} \qquad (3)$$

q_{ij} denotes the correlation coefficient between indicator *i* and indicator *j*. In this paper, Pearson's correlation coefficient, i.e., linear correlation coefficient, is used.

Information carrying capacity: C_j Denoted as indicator *j* and information carrying capacity

$$C_j = \sigma_j f_j \qquad (4)$$

(3) Calculation of weights

The greater the information-carrying capacity, the greater the weight can be considered to be

$$\omega_j = \frac{C_j}{\sum_{j=1}^{m} C_j} \qquad (5)$$

2.2.2 Fuzzy integrated evaluation

Fuzzy Integrated Evaluation is a fuzzy logic-based method for dealing with uncertainty and ambiguity in evaluation problems. It applies the concepts and techniques of fuzzy logic to the evaluation process to better deal with vague and incomplete information and the interrelationships between multiple evaluation indicators[19-20].

In fuzzy comprehensive evaluation, various aspects of the evaluation object are usually described by fuzzy sets. A fuzzy set is a kind of civic tool that can represent uncertainty and fuzziness, which can mean different degrees of affiliation according to other affiliation functions, and by transforming various aspects of the evaluation object into fuzzy sets, the uncertainty and fuzziness in the evaluation problem can be better reflected[21]. In addition, fuzzy comprehensive evaluation can deal with the interrelationships between multiple evaluation indicators[22], and by defining appropriate arithmetic rules and aggregation methods, the contributions of different evaluation indicators can be synthesized to arrive at the final evaluation results.

The fuzzy comprehensive evaluation method can better deal with the uncertainty and ambiguity in the evaluation problem. Through the use of fuzzy sets, vague and incomplete information can be incorporated into the evaluation process to characterize the evaluation object more accurately. Meanwhile, in the evaluation problem, there are often multiple evaluation indicators, and the relationship between them is complex. The fuzzy comprehensive evaluation method can consider the interrelationship between different evaluation indicators, and by defining appropriate arithmetic rules and aggregation methods, it can comprehensively consider each indicator's contribution and arrive at a comprehensive evaluation result. In addition, the fuzzy complete evaluation method is flexible. It can be adjusted and applied according to specific evaluation problems, which can be adapted to different evaluation objects and indicators and meet the needs of varying evaluation problems. In addition, the fuzzy comprehensive evaluation method can transform the vague and incomplete information in the evaluation problem into quantitative evaluation results. By calculating the affiliation degree and complete evaluation value of the

object, specific evaluation results can be derived, providing a reliable basis for decision-makers.

In general, the fuzzy comprehensive evaluation method can better deal with uncertainty and ambiguity in evaluation problems, consider the interrelationships of multiple evaluation indicators, and provide flexible and quantitative evaluation results. These advantages make the fuzzy comprehensive evaluation method widely used in many fields, such as engineering management, decision support, and environmental evaluation. It can help decision-makers make rational evaluations and decisions in uncertain and fuzzy environments. However, the undefined comprehensive evaluation method also has some limitations, such as higher requirements for data, higher computational complexity, etc.[23] It is necessary to consider its applicability and regulations when using the fuzzy comprehensive evaluation method.

In the evaluation of Civics classroom teaching, fuzzy comprehensive evaluation can be used to measure students' Civics learning ability, thinking ability, and cooperation ability. It can be used to analyze students' performance and assignments in the Civics classroom and assess their understanding of Civics knowledge. A fuzzy comprehensive evaluation can transform the data of students' homework scores and classroom participation into fuzzy sets and calculate complete Civics comprehension evaluation results; fuzzy thorough evaluation can change students' performance in problem-solving into fuzzy sets and calculate comprehensive problem-solving ability evaluation results; fuzzy comprehensive evaluation can transform teachers' performance in teaching preparation into fuzzy sets and calculate complete ability evaluation results. In this paper, considering the complexity of Civics classroom teaching evaluation, the CRITIC method and fuzzy comprehensive evaluation are combined, which not only can make up for the poor weighting brought by the undefined complete evaluation method but also provides a new evaluation model applied in Civics classroom teaching evaluation, the detailed steps are as follows.

(1) Determine the fuzzy relationship that defines each evaluated object

$$R = \begin{pmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nm} \end{pmatrix} \quad (6)$$

Equation: r_{ij} -frequency distribution of the ith factor on the jth rubric, i.e., rank affiliation, and 1.

(2) Calculate the overall judgment vector

Combining the weight values and the fuzzy relationship matrix R, the overall evaluation vector of the indicators is determined.

$$B = \omega \times R = (\omega_1, \cdots, \omega_n) \times \begin{pmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nm} \end{pmatrix} \quad (7)$$

In the comprehensive evaluation of this paper, five levels of rubrics are set for each indicator, i.e., V=[V1, V2, V3, V4, V5] = [Excellent, Good, Medium, Average, Poor], and assigned the value of V=[5, 4, 3, 2, 1] Several experienced people evaluate the value system of the indicator. Each expert individually scores the level of each hand in the indicator layer. Due to the fuzzy nature of the needle, the number of times each person scored the indicator can be synthesized to derive the degree of affiliation of the hand belonging to a specific rubric level and take the weight of the rubric level of multiple people agreeing with the indicator as the degree of cooperation, to establish a single-factor fuzzy comprehensive judgment matrix.

3 Evaluation of Civics Classroom Teaching Based on CRITIC-Fuzzy Comprehensive Evaluation

3.1 Data sources

Considering that the evaluation tends to be more feedback and preparation, the data used in this paper are derived from statistical data, data to be used primarily in the form of questionnaires and other forms of obtaining, the total number of people surveyed is 10, the final results of the survey as shown in Table 1.

Table 1 Survey data table

Tertiary Indicators	Inquiry 1	Inquiry 2	Inquiry 3	Inquiry 4	Inquiry 5	Inquiry 6	Inquiry 7	Inquiry 8	Inquiry 9	Inquiry 10
Teaching Characteristics	5	5	5	4	4	3	4	5	4	4
Attitude	4	4	4	4	3	4	5	5	3	3
Teaching Ability	4	3	3	5	4	4	3	4	5	5
Teaching Process	4	4	5	5	5	4	4	4	4	4
Teaching Philosophy	4	3	4	4	4	4	3	4	3	3

Teaching Strategy	5	4	4	3	3	5	4	5	4	4
Teaching Goal	3	4	5	5	4	4	4	3	4	5
Educational Content	4	5	5	5	3	3	4	4	5	4
Independent Study	4	3	4	4	5	5	4	4	3	5
Student Participation	4	5	4	4	3	5	5	3	5	5
Creative Awareness	3	4	4	3	4	3	4	5	4	4
Completion Of Teaching Content	5	3	5	4	4	4	4	4	4	3
Classroom Atmosphere	5	5	5	5	4	3	4	3	4	4
Student Knowledge Acquisition	4	4	4	4	4	4	5	4	4	3

The data questionnaire was tabulated; the results are in the table below.

Table 2 Statistical tables

Tertiary Indicators	Talented	Favorable	Moderate	General	Differ from
Teaching Characteristics	4	5	1	0	0
Attitude	2	5	3	0	0
Teaching Ability	3	4	3	0	0
Teaching Process	3	7	0	0	0
Teaching Philosophy	0	6	4	0	0
Teaching Strategy	3	5	2	0	0
Teaching Goal	3	5	2	0	0
Educational Content	4	4	2	0	0
Independent Study	3	5	2	0	0
Student Participation	5	3	2	0	0
Creative Awareness	1	6	3	0	0
Completion Of Teaching Content	2	6	2	0	0
Classroom Atmosphere	4	4	2	0	0
Student Knowledge Acquisition	1	8	1	0	0

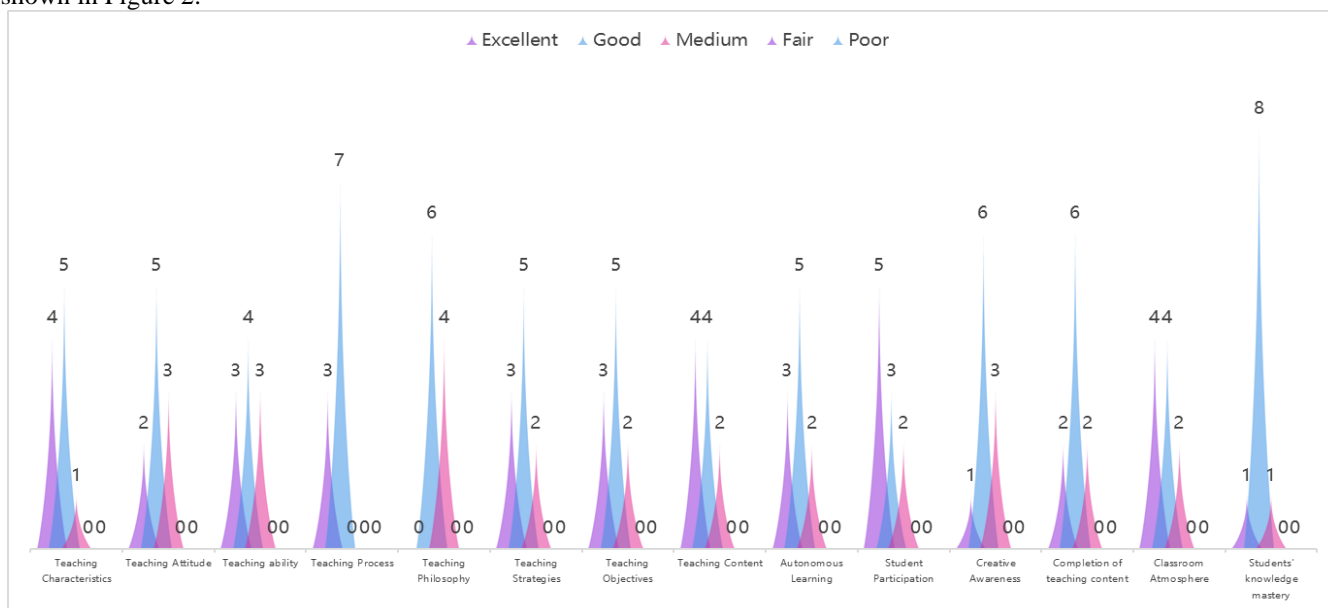Single-indicator statistical mapping was conducted, as shown in Figure 2.

Figure 2 Statistical Chart

Based on Figure 2, the survey of the lowest rating of 3, medium, preliminary analysis, the teacher of this section of the Civics class lecture knowledge is well-prepared. The students mastered better in class, but there is still room for improvement—the specific analysis of the following is combined with the CRITIC method and fuzzy comprehensive evaluation analysis.

3.2 Determination of indicator weights based on the CRITIC method

Through equation (1)-equation (5) for evaluating the importance of civics classroom teaching indicators, the data calculation can be Table 3-1, which contains ten objective weighting calculation samples. This advantage is that the statistical data can be continuously expanded, and ultimately will be the more and more objective response to the importance of the indicators, and ultimately tends to a certain degree of stability, which can be used as a "database plate. "

This paper lists the standardized data, calculated correlation coefficients, and weights in Tables 3, 4, and 5.

Table 3 Standardized data processing results

Data Standardization	Inquiry 1	Inquiry 2	Inquiry 3	Inquiry 4	Inquiry 5	Inquiry 6	Inquiry 7	Inquiry 8	Inquiry 9	Inquiry 10
Teaching Characteristics	1.0000	1.0000	1.0000	0.5000	0.5000	0.0000	0.5000	1.0000	0.5000	0.5000
Attitude	0.5000	0.5000	0.5000	0.5000	0.0000	0.5000	1.0000	1.0000	0.0000	0.0000
Teaching Ability	0.5000	0.0000	0.0000	1.0000	0.5000	0.5000	0.0000	0.5000	1.0000	1.0000
Teaching Process	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Teaching Philosophy	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	0.0000
Teaching Strategy	1.0000	0.5000	0.5000	0.0000	0.0000	1.0000	0.5000	1.0000	0.5000	0.5000
Teaching Goal	0.0000	0.5000	1.0000	1.0000	0.5000	0.5000	0.5000	0.0000	0.5000	1.0000
Educational Content	0.5000	1.0000	1.0000	1.0000	0.0000	0.0000	0.5000	0.5000	1.0000	0.5000
Independent Study	0.5000	0.0000	0.5000	0.5000	1.0000	1.0000	0.5000	0.5000	0.0000	1.0000
Student Participation	0.5000	1.0000	0.5000	0.5000	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000
Creative Awareness	0.0000	0.5000	0.5000	0.0000	0.5000	0.0000	0.5000	1.0000	0.5000	0.5000
Completion Of Teaching Content	1.0000	0.0000	1.0000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.0000
Classroom Atmosphere	1.0000	1.0000	1.0000	1.0000	0.5000	0.0000	0.5000	0.0000	0.5000	0.5000
Student Knowledge Acquisition	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	1.0000	0.5000	0.5000	0.0000

Table 4 Summary table of correlation coefficients

Correlation Coefficient	Teaching Characteristics	Attitude	Teaching Ability	......	Student Knowledge Acquisition
Teaching Characteristics	1.0000	0.2900	-0.4032	......	0.0000
Attitude	0.2900	1.0000	-0.5533	......	0.6389
Teaching Ability	-0.4032	-0.5533	1.0000	......	-0.5774
......	......	......	......	......	......

Student Knowledge Acquisition	0.0000	0.6389	-0.5774	..... .	1.0000

Table 5 Results of weighting calculations

Tertiary Indicators	Comparative	Paradoxical	Information Carrying Capacity	Weights
Teaching Characteristics	0.3375	12.3772	4.1770	0.0593
Attitude	0.3689	12.6367	4.6621	0.0661
Teaching Ability	0.4082	14.9413	6.0997	0.0865
Teaching Process	0.4830	12.4249	6.0018	0.0852
Teaching Philosophy	0.5164	12.6172	6.5155	0.0924
Teaching Strategy	0.3689	14.1006	5.2022	0.0738
Teaching Goal	0.3689	13.3250	4.9160	0.0697
Educational Content	0.3944	12.3874	4.8857	0.0693
Independent Study	0.3689	14.6921	5.4204	0.0769
Student Participation	0.4116	14.9651	6.1602	0.0874
Creative Awareness	0.3162	14.1887	4.4869	0.0637
Completion Of Teaching Content	0.3333	11.8444	3.9481	0.0560
Classroom Atmosphere	0.3944	12.4008	4.8909	0.0694
Student Knowledge Acquisition	0.2357	13.2238	3.1169	0.0442

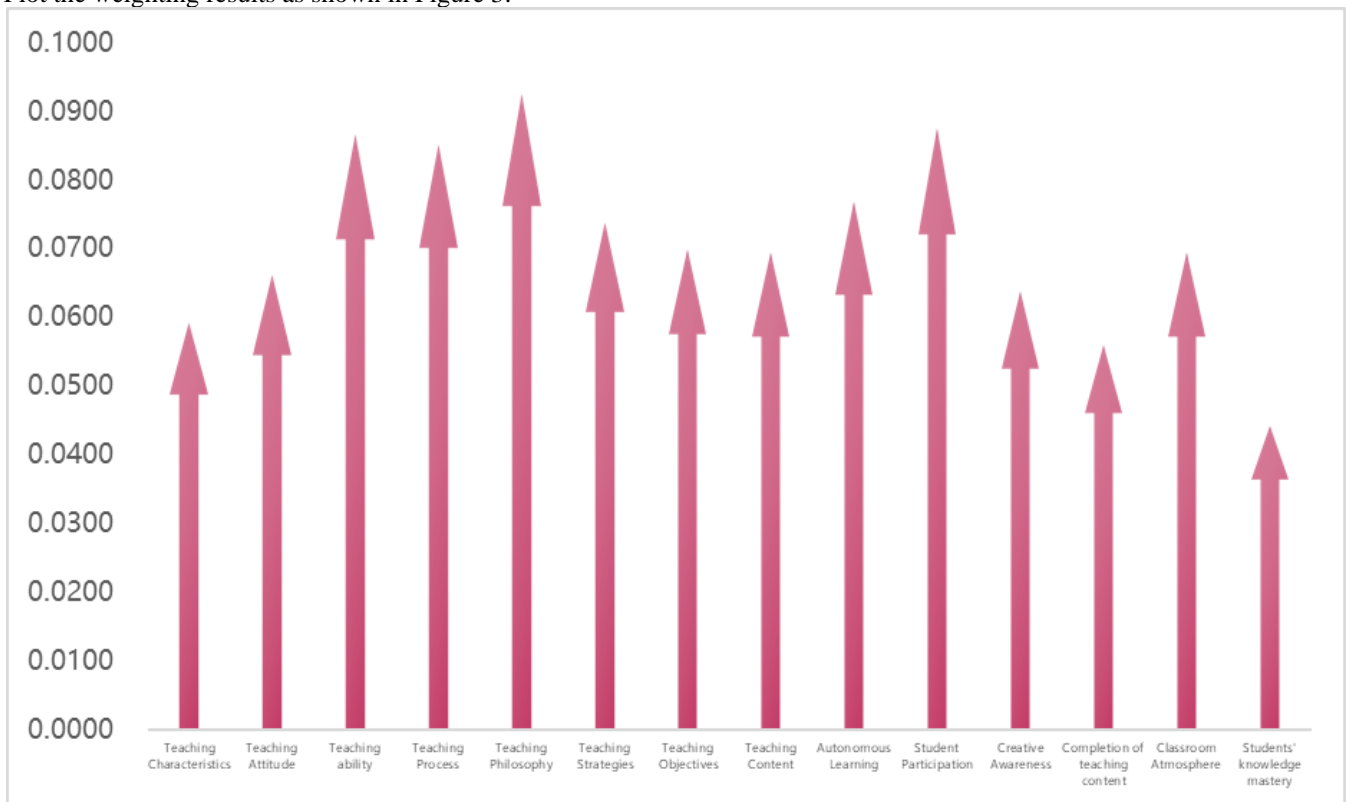Plot the weighting results as shown in Figure 3.

Figure 3 Table of weights

Based on the above weight calculation table and weight result chart, the weight values of teaching ability, teaching p, philosophy, and student participation are relatively high. Now, the Author analyzes the more critical indicators. The importance of teaching ability is that it has a decisive impact on the quality of education and students' learning outcomes; teachers with excellent teaching ability can effectively impart knowledge and skills to help students understand and master the subject content. They can personalize teaching according to students' characteristics and learning styles, stimulate students'

interest and motivation, and thus improve their learning outcomes. Teachers with excellent teaching ability use various teaching strategies and methods to make classroom content lively and engaging and stimulate students' interest in learning. They can boost students' thinking and creativity through heuristic teaching, case studies, group discussions, etc., to enhance their active participation and understanding. Teachers with strong teaching abilities can create and maintain a positive learning environment, create an atmosphere of mutual respect and cooperative learning, and enhance students' self-confidence and learning motivation, so improving teachers' teaching ability is one of the essential ways to improve the quality of education. The importance of teaching philosophy lies in its guiding and standardizing effect on teachers' teaching ideas, methods, and objectives. Teaching philosophy can help teachers clarify their goals and formulate corresponding teaching strategies and techniques. Teaching philosophy reflects the teacher's knowledge and expectation of students' knowledge, skills, and qualities, thus helping teachers determine the teaching objectives and design the corresponding teaching activities. Teaching philosophy plays a guiding role in teaching methods and strategies for teachers. Different teaching philosophies correspond to other teaching methods; for example, the student-centered teaching philosophy encourages teachers to adopt interactive teaching methods such as inspirational teaching and inquiry learning, while the teacher-centered teaching philosophy pays more attention to knowledge transfer and explanation, in a word, the importance of teaching philosophy lies in the guiding role it plays in the teaching objectives, teaching methods, teachers' behaviors and attitudes, and at the same time promotes the professional development and growth of teachers. A clear teaching philosophy helps teachers organize and implement teaching and learning activities to improve teaching effectiveness and student learning outcomes. The importance of student participation lies in its ability to motivate students, improve learning outcomes, and develop their overall competencies. Moreover, students can better understand knowledge, thinking skills, self-confidence, socialization, and creative and practical skills through active participation in learning activities.

3.3 Evaluation of Civics Classroom Teaching Based on Fuzzy Comprehensive Evaluation

This paper performs a fuzzy comprehensive evaluation according to equation (6)-equation (7).
The rank affiliation matrix was calculated based on Table 2, as shown in Table 6 below.

Table 6 Affinity matrix

Degree Of Affiliation (Math.)	Talented	Favorable	Moderate	General	Differ From
Teaching Characteristics	0.4	0.5	0.1	0	0
Attitude	0.2	0.5	0.3	0	0
Teaching Ability	0.3	0.4	0.3	0	0
Teaching Process	0.3	0.7	0	0	0
Teaching Philosophy	0	0.6	0.4	0	0
Teaching Strategy	0.3	0.5	0.2	0	0
Teaching Goal	0.3	0.5	0.2	0	0
Educational Content	0.4	0.4	0.2	0	0
Independent Study	0.3	0.5	0.2	0	0
Student Participation	0.5	0.3	0.2	0	0
Creative Awareness	0.1	0.6	0.3	0	0
Completion Of Teaching Content	0.2	0.6	0.2	0	0
Classroom Atmosphere	0.4	0.4	0.2	0	0
Student Knowledge Acquisition	0.1	0.8	0.1	0	0

The table of weights and the table of the results of the affiliation calculations show that the analysis of the teacher's evaluation rating in this lesson is shown in Table 7.

Table 7 Evaluation results

Norm	Talented	Favorable	Moderate	General	Differ From	Appraise Value
Teachers' Teaching Process	0.2644	0.5179	0.2180	0.0000	0.0000	4.0472
Student Learning Process	0.3209	0.4513	0.2280	0.0000	0.0000	4.0933
Teaching Effect	0.2558	0.5703	0.1739	0.0000	0.0000	4.0818
Evaluation Of Civics Classroom Teaching	0.2758	0.5116	0.2128	0.0000	0.0000	4.0639

For the Tier 1 indicators and the Objective Tier, it can be seen that the ratings are all greater than 4, i.e., the ratings are all above good and moving towards excellent, indicating that the quality of the lesson is high.
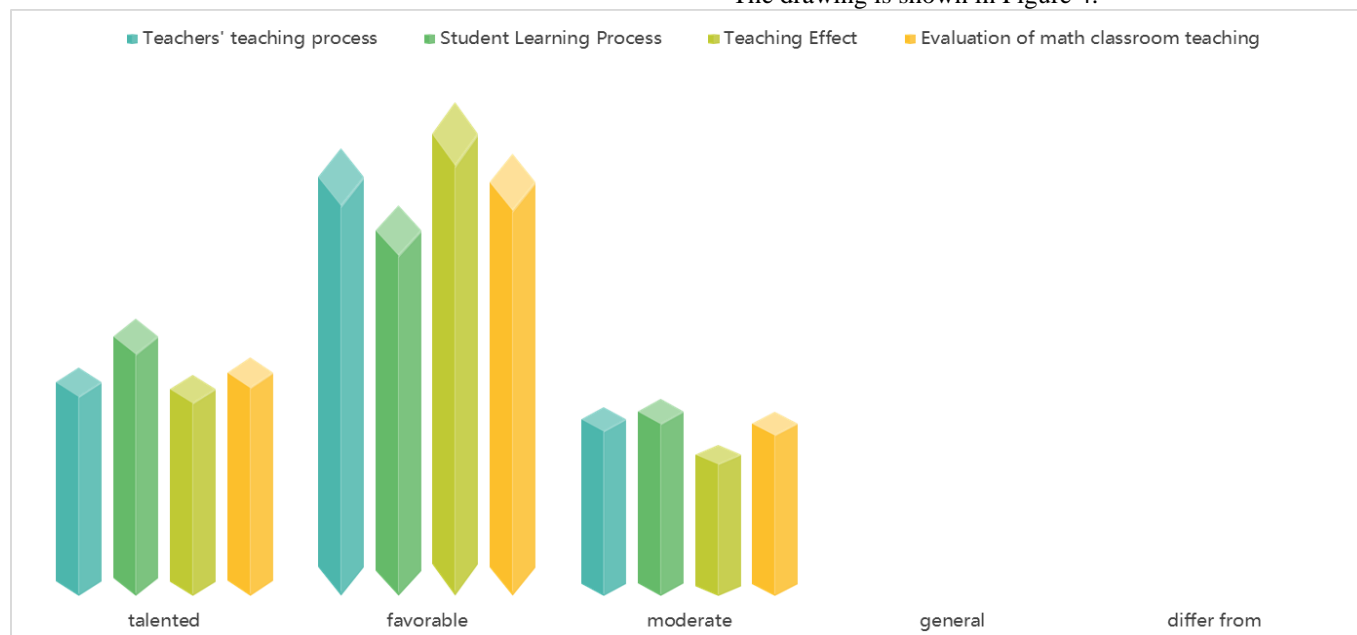
The drawing is shown in Figure 4.

Figure 4 Degree of hierarchical affiliation

As seen through the above figure, the affiliation degree is distributed in excellent, sound, and medium, in which all the good grades are the highest, and according to the principle of maximum affiliation, the quality can be evaluated as good.

4 Conclusion

This paper analyzes examples based on the CRITIC method and the fuzzy comprehensive evaluation method, and the results prove that the CRITIC method provides complete evaluation information and can promote the overall development of students. It is also seen that the CRITIC method has some challenges. One is the development of evaluation criteria, which requires teachers to clarify the evaluation content and scoring criteria for each dimension. Another challenge is interpreting evaluation results, which requires teachers to understand the results and provide effective feedback accurately. It needs to be clear that the entropy weighting method and the fuzzy comprehensive evaluation method are based on different principles of evaluation; the CRITIC method is used to determine the weights of the indicators and emphasizes the contradictions and contrasts between the hands; while the fuzzy comprehensive evaluation method focuses on evaluation and reflects unclear nature. The two approaches are complementary and can supplement each other to improve the accuracy and reliability of the evaluation results. The conclusions are as follows: the evaluation of students' participation is high: students show a high degree of involvement in the Civics classroom, actively answering questions, participating in discussions, and demonstrating a strong interest in Civics knowledge. Good evaluation of knowledge mastery: Students showed good skills in Civics knowledge and could accurately understand and apply Civics concepts, formulas, and methods to solve various Civics problems. Evaluation of problem-solving ability is medium: Students' performance in Civics problem-solving ability is medium; they can apply the knowledge they have learned about Civics to solve simple and partially complex Civics problems, but they need to strengthen their capacity in some more complex issues.

5 Funding

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