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# Research on Evaluating the Quality of Civic Education Evaluation in Colleges and Universities in the New Media Era Based on Artificial Intelligence

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**SUMMARY:** *At present, the evaluation and assessment of Civics and Political Science courses in colleges and universities still face a number of problems, including insufficient recognition of the importance of evaluation, an imperfect indicator framework, and the limited effectiveness of the application of assessment results. To address these issues, this paper proposes a binary semantic evaluation method by taking the processing of linguistic evaluation information as the starting point. Linguistic descriptions of the quality of civics and political education are transformed into binary semantic expressions through a conversion function, and the definition of a binary semantic weighted averaging operator is derived on the basis of their ordered characteristics. In combination with the entropy weighting approach, the comprehensive weights of the indicators are jointly determined, and the binary semantic set pair operator is then employed to calculate the overall evaluation value of the object under assessment. By using the constructed model that integrates binary semantics and entropy weighting to evaluate the quality of ideology and politics education, a normalized feature vector is obtained through calculation. The results show that "teaching attitude" and "teaching content" account for relatively high weights in the whole indicator system, reaching 0.395 and 0.274, respectively. At the second-level indicator layer, students' comprehensive mastery and enhanced ability achieve the highest scores, which is consistent with the dimensional score of the first-level indicator, at 67.63, indicating that during the implementation of Civic Education, students are able to acquire comprehensive knowledge and strengthen their civic learning ability. According to the corresponding rubric, the evaluation level of the second-level indicators is concentrated mainly at the excellent level, with nine indicators classified as excellent in total. From an overall perspective, the quality level of Civic and Political Education in SL universities can be regarded as excellent and is generally at a relatively good standard.*

***KEYWORDS:*** *binary semantics; entropy weight method; normalized feature vector; quality of civic and political education; comprehensive evaluation value*

# 1 Introduction

Civic and political education in colleges and universities plays a vital role in cultivating students' values and shaping their development, and it is often described as the "first lesson" of higher education institutions. In the new media era, students' ways of thinking and value orientations are increasingly influenced by diverse external factors. Under such circumstances,

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how to improve the quality of civic and political teaching in colleges and universities and how to deepen reform in its instructional model have become important issues facing higher education institutions [1]. Establishing a scientific, standardized, and orderly quality evaluation framework for civic and political education is therefore regarded as a key link. Comprehensive, objective, systematic, and scientific evaluation of the quality of ideology and politics teaching, together with an authentic assessment of its actual conditions, can provide colleges and universities with an important and direct theoretical basis and practical reference for promoting reform in ideology and politics education and teaching.

At present, traditional educational evaluation methods rely largely on examination outcomes. This single evaluation pattern makes it difficult to reflect comprehensively and accurately the learning process, students' capability development, and overall quality, and it also fails to capture the impact of the new media era on students' thinking. In addition, the literature [2] points out that the current evaluation system for civic education is relatively simple, with strong fuzziness, limited openness, and insufficiently effective supervision, and therefore develops a decision-making system for civic education evaluation to improve transparency. Literature [3] proposes a quality evaluation framework for Civic and Political Education based on hierarchical analysis. This framework centers on curriculum design, teacher development, student cognition, and student growth, and the evaluation results help clarify the hierarchical relationships among these elements, thereby supporting teaching reform. However, these approaches remain relatively limited in efficiency.

Literature [4] combines an improved machine learning model with speech technology to synthesize the evaluation of civic education and derive the influence curve of evaluation indicators on the basis of hypothetical model inference and class-attribute probabilities. Literature [5] analyzes the teaching quality evaluation system of Civic and Political Education through deep learning and develops both a quality testing model and a quality evaluation system with the support of an evaluation reference framework and MATLAB simulation software. Literature [6] improves the back-propagation neural network algorithm by integrating a genetic algorithm and entropy method, and then establishes a Civic and Political Education Teaching Quality Assessment Model and Evaluation System. Although the model fit reaches 97%, it still requires many iterations before reaching the desired assessment state. Literature [7] proposes a prediction and assessment system for the teaching effect of Civic and Political Education based on AI and big data technology. By applying machine learning models such as Support Vector Machines, it analyzes and predicts data relating to student behavior, interaction, and feedback, thereby improving the accuracy and real-time performance of teaching assessment and feedback. Literature [8] develops a Civic and Political Education Evaluation System based on multitask learning and softmax regression. It synthesizes multidimensional indicators such as educational effectiveness, campus division, and social reputation, and introduces an artificial neural network to assess the quality of Civic and Political Education. Literature [9] ntegrates a convolutional neural network with a bidirectional long short-term memory network to analyze visual behavior and understand classroom semantics, respectively. In this way, it captures evaluation indicators such as classroom participation, course depth, emotional tone, and teaching clarity from the intelligent Civic and Political Education system used for teaching quality evaluation, and it is capable of generating feedback reports and heat maps of students' participation. Literature [10] compares the reliability of artificial neural networks, convolutional neural networks, and support vector machines in assessing Civic Education, showing that their reliability gradually improves, while support vector machines demonstrate the strongest prediction accuracy. Literature [11] further notes that many factors influence the evaluation of Civic and Political Education in colleges and universities, involving policies, schools, teaching systems, teachers, students,

and other dimensions, which jointly shape the formation of the evaluation system. In the new media era, student media behavior data should also be incorporated into the scope of teaching quality evaluation indicators in order to achieve more accurate evaluation outcomes.

In this paper, a subjective assignment method is proposed for the processing of linguistic evaluation information, with the aim of avoiding information loss and distortion arising from the collection and handling of traditional evaluation data. Based on the basic characteristics of information entropy, the entropy weighting method is introduced as an objective weighting approach. Through the conversion function, linguistic descriptions are transformed into binary semantics, and the inverse function further converts them into the corresponding numerical values. The averaging operator of binary semantic arithmetic is then defined and used to determine the comprehensive weights of indicators for evaluating the quality of education in the Civics classroom by combining the subjective and objective attribute weights generated through the binary semantic method and the entropy weighting method. On the basis of the distances among indicators, the subjective and objective weights are jointly identified, and the overall evaluation value of the target object is obtained. Taking SL College as an example, this study constructs a classroom civics teaching quality evaluation index system. By integrating binary semantics with the entropy weighting method, it assigns weights to the indicators, calculates the score of each indicator in the evaluation system, derives the corresponding set of comments, identifies the current problems in the quality of Civic and Political Education, and proposes corresponding measures to address them.

# 2 Evaluation of Civic Education Quality Based on Binary Semantics and Entropy Power Approach

## 2.1 Evaluation methodology

The binary semantic evaluation method is an effective subjective empowerment method for the operation of linguistic evaluation information, which effectively avoids the information loss and distortion in the set and operation of linguistic evaluation information, and makes the result of linguistic information calculation more accurate. Information entropy indicates the degree of uncertainty in the values taken by random variables. The larger the amount of information, the smaller the uncertainty and the smaller the entropy. The smaller the amount of information, the greater the uncertainty and the greater the entropy. Based on this characteristic, the entropy weighting method is regarded as an objective weighting method.

### 2.1.1 Basic concepts of binary semantics

Let the set of evaluated language phrases be $S=\{s_0,s_1,\cdots,s_T\}$, an ordered set consisting of an odd number of elements, and $s_i \in S$ be the $i$ th language phrase. In this paper, let $S$ be the set of seven-grained language phrases, i.e., $S=\{s_0=DL$ (very low), $s_1=L$ (low), $s_2=VL$ (low), $s_3=M$ (average), $s_4=VH$ (high), $s_5=H$ ( high), $s_6=DH$ (very high).

Depending on the occasion of the research problem, this paper also uses the following set of linguistic phrases: $S=\{s_0=DB$ (very poor), $s_1=B$ (poor), $s_2=VB$ (poor), $s_3=M$ (fair), $s_4=VG$ (good), $s_5=G$ (good), $s_6=DG$ (very good). or $S=\{s_0=DL$ (very unimportant), $s_1=L$ (unimportant), $s_2=VL$ (less important), $s_3=M$ (fair), $s_4=VH$ (more important), $s_5=H$ (important), $s_6=DH$ (very important). Binary semantics is an

approach that employs $(S_i, \alpha_i)$ to represent linguistic evaluation information over a continuous domain.

Where $S_i$ denotes the above language phrase, $\alpha_i$ denotes the deviation of the linguistic information obtained by the computation from the closest linguistic phrase in the predefined set of linguistic information $S$ with $\alpha \in [-0.5, 0.5)$.

### 2.1.2 Transformation of binary semantic information

The linguistic phrase $s_i$ can be transformed into a binary semantic form by the transformation function $\theta$:

$$\begin{aligned} &\theta : S \to S \times [-0.5, 0.5) \\ &\theta(s_i) = (s_i, 0), s_i \in S \end{aligned} . \tag{1}$$

Let the real number $\beta \in [0, T]$, denote the result of a linguistic phrase-set operation, then its corresponding binary semantic form can be obtained by the function $\Delta$:

$$\begin{aligned} &\Delta : [0, T] \to S \times [-0.5, 0.5) \\ &\Delta(\beta) = (s_i, \alpha) = \begin{cases} s_i, i = round(\beta) \\ \alpha = \beta - i, \alpha \in [-0.5, 0.5) \end{cases} \end{aligned} \tag{2}$$

where “round” denotes the “rounding” operation.

Accordingly, if $(s_i, \alpha)$ is a binary semantics, then there exists an inverse function $\Delta^{-1}$, which is converted to the corresponding numeric value, namely:

$$\begin{aligned} &\Delta^{-1} : S \times [-0.5, 0.5) \to [0, T] \\ &\Delta^{-1}(s_i, \alpha) = i + \alpha = \beta \end{aligned} \tag{3}$$

### 2.1.3 Ordering of binary semantic information

If $(s_i, \alpha_1)$ and $(s_j, \alpha_2)$ are any two binary semantic messages, then their comparison is ordered:

When $i < j$, then $(s_i, \alpha_1) < (s_j, \alpha_2)$ means that $(s_i, \alpha_1)$ is inferior to $(s_j, \alpha_2)$.

When $i = j$.

1. If $\alpha_1 = \alpha_2$, then $(s_i, \alpha_1) = (s_j, \alpha_2)$ means that $(s_i, \alpha_1)$ equals $(s_j, \alpha_2)$.
2. If $\alpha_1 < \alpha_2$, then $(s_i, \alpha_1) < (s_j, \alpha_2)$ is $(s_i, \alpha_1)$ inferior to $(s_j, \alpha_2)$.
3. If $\alpha_1 > \alpha_2$, then $(s_i, \alpha_1) > (s_j, \alpha_2)$ means that $(s_i, \alpha_1)$ is preferred over $(s_j, \alpha_2)$.

### 2.1.4 Operators for binary semantic information

Assuming that $(s_1, \alpha_1), (s_2, \alpha_2), \cdots, (s_n, \alpha_n)$ is a set of binary semantic information, the binary semantic arithmetic mean operator is defined as:

$$\bar{B} = (\bar{s}, \bar{\alpha}) = \Delta\left(\frac{1}{n}\sum_{i=1}^{n}\Delta^{-1}(s_i, \alpha_i)\right) \tag{4}$$

$W = \left((w_1, \alpha_1'), (w_2, \alpha_2'), \cdots, (w_n, \alpha_n')\right)^T$ is the corresponding binary semantic weight vector, where $w_i \in S, \alpha_i' \in [-0.5, 0.5)$.

Then the binary semantic weighted average operator is defined as:

$$\hat{B} = (\hat{s}, \hat{\alpha}) = \Delta\left[\frac{\sum_{i=1}^{n}\left[\Delta^{-1}(w_i, \alpha_i') \times \Delta^{-1}(s_i, \alpha_i)\right]}{\sum_{i=1}^{n}\Delta^{-1}(w_i, \alpha_i')}\right] \tag{5}$$

## 2.2 Evaluation of the quality of Civics teaching

In this paper, for the problem of evaluating the quality of Civics and Politics classroom teaching, we give a method of integrating the weights of subjective and objective attributes based on binary semantics and entropy weighting method, which is used to determine the comprehensive weights of the indicators, and finally the binary semantics set operator is used to compute the comprehensive appraisal value of the evaluation object. The specific steps are:

### 2.2.1 Binary semantic representation specification processing

The $\tilde{r}_i^k$ in the vector $\tilde{R}_k = \left(\tilde{r}_i^k\right)_{m\times 1}$ of the evaluation of the quality of classroom teaching given by the expert is transformed into a normalized binary semantic representation $(r_i^k, 0)$, and the $\tilde{W}_i^k$ in the vector $\tilde{W}_k = \left(\tilde{W}_i^k\right)_{m\times 1}$ of the evaluation of the importance of indicators given by the expert is transformed into a normalized binary semantic representation $(w_i^k, 0)$.

### 2.2.2 Calculation of distances for each evaluation indicator

According to the definition of binary semantics, the distance between the binary semantic evaluation results of expert $e_k$ and expert $e_j$ on the metric $u_i$ can be denoted as $d_i\left(e_k, e_j\right)$, and the binary semantics evaluations of expert $e_k$ on that metric and all the other experts' The average distance can be written as $d_i^k = \frac{1}{p-1}\sum_{j=1,\neq k}^{p} d_i\left(e_k, e_j\right)$.

### 2.2.3 Determination of subjective weights for indicators

The difference between an expert $e_k$ and other experts on the metric $u_i$ is proportional to $d_i^k$, the larger $d_i^k$ is, the larger the gap is, and the smaller the a posteriori weight should be. Therefore, the a posteriori weight is defined as:

$$v_i^k(2) = \frac{\frac{1}{d_i^k}}{\sum_{k=1}^{p}\frac{1}{d_i^k}} \tag{6}$$

and satisfy $\sum_{k=1}^{p} v_i^k(2)=1$, the a priori weight $v_i^k(1)$ given through the a priori information of the expert's knowledge, specialty, and authority and the a posteriori weight $v_i^k(2)$ are combined organically, then we get the expert's $e_k$ weights on the indicator $u_i$ on the indicator $u_i^k(2)$:

$$v_i^k = \frac{v_i^k(1)v_i^k(2)}{\sum_{k=1}^{p} v_i^k(1)v_i^k(2)} \tag{7}$$

According to the experts' description of the importance of each indicator, the information is assembled using the binary semantic weighted average operator, and then the assembled results are normalized to obtain the subjective weight of the indicator. The formula for the subjective weight of indicator $u_i$ is:

$$v_i = \frac{\sum_{k=1}^{p} v_i^k \Delta^{-1}\left(w_{si}^k, 0\right)}{\sum_{i=1}^{m}\sum_{k=1}^{p} v_i^k \Delta^{-1}\left(w_{si}^k, 0\right)} \tag{8}$$

and $\sum_{i=1}^{m} v_i = 1$ is satisfied.

### 2.2.4 Calculation of objective weights for indicators

Calculate the objective weights of the indicators, analyze the data collected from the questionnaire, and determine the objective weights $u_i$ of each indicator using the formula of the entropy weight method.

### 2.2.5 Determination of composite weights for indicators

The subjective and objective weights of the indicators were assembled, utilizing the formula:

$$w_i = \lambda v_i + (1-\lambda)u_i \tag{9}$$

where $\lambda(\in[0,1])$ denotes the preference coefficient. The larger $\lambda$ is, the more the comprehensive weight tends to be subjective weight, and the smaller $\lambda$ is, the more the comprehensive weight tends to be objective weight. Since student evaluation is preferred when evaluating the quality of teachers' classroom teaching, $\lambda = 0.382$ is chosen here, and the composite weight is calculated as $W = \left(w_1, w_2, \cdots, w_{13}\right)'$.

### 2.2.6 Calculation of the comprehensive evaluation value of the subject of evaluation

Calculate the comprehensive evaluation value of the evaluation object. Information fusion is performed using the binary semantic average weighting operator to calculate the comprehensive evaluation value of the evaluation object:

$$Z = \Delta\left[\sum_{i=1}^{m} w_i \sum_{i=1}^{m} v_i^k \Delta^{-1}\left[\left(r_i^k, 0\right)\right]\right] \tag{10}$$

## 2.3 Establishment of evaluation index system

Classroom Civics teaching quality evaluation is a comprehensive evaluation problem characterized by multi-level, multi-indicator and multi-angle, so the principles of scientificity, systematicity and operability should be followed when constructing the evaluation index system. Although the evaluation index system of the existing literature is not completely unified, it is basically similar. Based on this, taking SL College as an example, the evaluation index system of classroom Civics teaching quality constructed by it is shown in Table 1. In the Civics Teaching Quality Evaluation Indicator System constructed in this paper, teaching attitude, teaching content, teaching method and teaching effect are taken as well as indicators, and secondary indicators are refined based on the primary indicators to carry out the evaluation of the quality of Civics education in SL College.

*Table 1: The evaluation index of the quality of the teaching quality*

| Primary indicator | Secondary indicator |
|---|---|
| Teaching Attitude | Rigorous and disciplined |
| | Be full of lessons and be serious |
| | Caring for students and strict requirements |
| Teaching content | Content is enriched, reflects the latest results, and the amount of information is moderate |
| | The emphasis is high and the depth is appropriate |
| | Meet the requirements of the syllabus |
| Teaching methods | The methods are varied and vivid |
| | The cultivation of students' innovation ability is guided and guided |
| | Good content, clear and systematic |
| | Language standards, vivid, concise practice |
| | Using artificial intelligence teaching technology and means to improve teaching method |
| Teaching effect | To mobilize students to learn enthusiasm and the atmosphere of the classroom |
| | Students have comprehensive and enhanced ability |

# 3 Example validation

## 3.1 Results of binary semantic evaluation of Civics teaching quality

For the comprehensive evaluation of the quality of Civics teaching in colleges and universities, let the set of evaluation indicators be $C = \{c_1, c_2, ..., c_m\}(m \geq 2)$, and the set of supervisory experts is $E = \{e_1, e_2, ..., e_p\}(p \geq 2)$, pre-set the linguistic evaluation set, the semantics of the evaluation indicators will be measured from four levels, the linguistic evaluation set is expressed as: $S = \{s_4, E(excellence), s_3 = G(good), s_2 = F(fair), s_1 = P(poor)\}$, and 4 attributes of teaching attitudes, teaching content, teaching methods, and teaching effectiveness as the attributes of the problem, i.e., $U = \{U_1, U_2, U_3, U_4\}$ Take 5 sections of the first year Civic Education course as an alternative, and for the sake of simplicity, take 5

sections of Civic Education as an example, i.e., alternative $A=\{A_1,A_2,A_3,A_4,A_5\}$. The quality evaluation is based on percentage scoring and the quality of Civic and Political Education is based on the semantic evaluation set described earlier.The quality of Civic and Political Education in SL College is shown in Table 2.

*Table 2: The quality of the education of the second life college*

| Plan | U1 | U2 | U3 | U4 |
|---|---|---|---|---|
| A1 | 89 | 78 | 78 | 78 |
| A2 | 86 | 82 | 78 | 80 |
| A3 | 85 | 70 | 80 | 85 |
| A4 | 78 | 85 | 82 | 74 |
| A5 | 88 | 81 | 70 | 72 |

Step 1: Since $n=4$, if the arithmetic mean is used, the weight of each attribute is 0.25. Based on the purpose of encouraging students, the better quality of the Civics classroom is given a higher weight, and the lower quality is given a lower weight, and the worst quality of the Civics classroom is also considered appropriately, in order to urge the teacher to improve as soon as possible. For this purpose, the weight formula (3) is used to obtain the weight vector of each attribute as $U=(0.4,0.25,0.2,0.15)$. It is easy to see that the weight of smaller data in this weight is smaller and the weight of the smallest data is slightly larger than the next smallest data, which indicates that the smallest weight is also given some importance. Under this weight, the aggregation result is greater than the arithmetic average result, which can be seen that the decision maker is optimistic.

Step 2: For the first 3 columns, each column value is divided by the maximum value of that column to normalize all values. For example, if the maximum value of column 1 is 89, the normalized result obtained after dividing the value of that column by 89 is $(1,0.97,0.96,0.88,0.99)^T$.

Step 3: Use formula (1) to convert the values in the unit interval normalized in the previous step to binary semantics, and the data in column 4 is directly converted to binary semantics.

The evaluation value of scheme $A_2$ under attribute $U_1$ is given as an example of the computation process. The evaluation value of scheme $A_2$ under attribute $U_1$ is normalized to be 0.97, and it is easy to see that the linguistic variables $s_0,s_1,...,s_4$ has an affiliation function of 0 at 0.97, i.e., $\omega_i=0,i=0,1,...,4$. The affiliation function of the linguistic variable $\omega_5$ = 1-(0.97-0.83)÷0.17=0.18 at 0.97, and the affiliation function of the linguistic variable $s_6$ at 0.97 is $\omega_6$ =( 0.97-0.83) ÷ 0.17 = 0.82, and the result of converting 0.97 to binary semantics can be obtained by utilizing Equation (1) as $(s_6,-0.18)$.

Step 4 The binary semantic evaluation value of each student under each attribute is assembled using the binary semantic operator to obtain the composite evaluation value $((s_6,-0.294),(s_6,-0.399),(s_6,-0.387),(s_6,-0.465),(s_6,-0.412))$.

From the above comprehensive evaluation value, the quality of education in the Civics classroom can be ranked as: $A_1\succ A_3\succ A_2\succ A_5\succ A_4$, i.e., Civics classroom $A_1$ is the best in quality of education.

## 3.2 Assigning weights to indicators based on the entropy weighting method

### 3.2.1 Indicator weights of the evaluation system of the quality of Civic and political education

The binary semantics and entropy weighting method is used to assign weights to the indicators. First, a judgment matrix was constructed to determine the importance of each indicator in turn through two-by-two comparison of the indicators, using a scale of 1 to 9, representing a sequential increase in the degree of importance. Then, questionnaires were distributed to 30 scholars in the field of pedagogy, industry experts, etc., and the importance degree of each indicator was derived by combining the scoring of the experts. To ensure the reliability of the weights, the consistency test was performed on the matrix. Finally, the weights were assigned to the indicators of each dimension in turn, and the final weights of the evaluation system were obtained as shown in Table 3. By calculating the normalized feature vectors, it can be found that "teaching attitude" and "teaching content" occupy a relatively high weight in the entire index system, which are 0.395 and 0.274 respectively, while the weights of "teaching method" and "teaching effect" are relatively low, which are 0.125 and 0.206 respectively.

*Table 3: The final weight of the evaluation system*

| Primary indicator | Primary weight | Secondary indicator | Secondary weight |
|---|---|---|---|
| Teaching Attitude | 0.395 | Rigorous and disciplined | 0.525 |
| | | Be full of lessons and be serious | 0.236 |
| | | Caring for students and strict requirements | 0.239 |
| Teaching content | 0.274 | Content is enriched, reflects the latest results, and the amount of information is moderate | 0.352 |
| | | The emphasis is high and the depth is appropriate | 0.248 |
| | | Meet the requirements of the syllabus | 0.4 |
| Teaching methods | 0.125 | The methods are varied and vivid | 0.352 |
| | | The cultivation of students' innovation ability is guided and guided | 0.258 |
| | | Good content, clear and systematic | 0.284 |
| | | Language standards, vivid, concise practice | 0.106 |
| | | Using artificial intelligence teaching technology and means to improve teaching method | 0.236 |
| Teaching effect | 0.206 | To mobilize students to learn enthusiasm and the atmosphere of the classroom | 0.389 |
| | | Students have comprehensive and enhanced ability | 0.375 |

### 3.2.2 Scores of Indicators at All Levels of the Quality Evaluation System of Civic and Political Education

Table 4 shows the scores of indicators at all levels of the evaluation system for the quality of education in college civics classrooms, and in the secondary dimension, the scores are teaching effect, teaching attitude, teaching method, and teaching content in descending order, and the scores are 66.66, 64.99, 64.77, and 64.02, respectively. It shows that the implementation of course Civics has a more obvious effect in terms of teaching effect,

reflecting the new media era of artificial intelligence, which is more important for teaching effect. The effect is good in terms of teaching attitude, reflecting the attention of the course Civics to improve the teaching attitude. And the evaluation in terms of teaching content is not high, indicating that Civics should further strengthen the setting of teaching content. On the secondary indicators, the indicator of students' comprehensive mastery and ability enhancement scored the highest, which is consistent with the high rating of the primary dimension, 67.63, while the indicator of language standardization, vividness and conciseness scored a lower score of 63.25, indicating that the link of language standardization, vividness and conciseness needs to be paid more attention to and implemented in the process of Civic Politics implementation.

*Table 4: The quality evaluation system of the university is divided*

| Primary indicator | Score | Secondary indicator | Score |
|---|---|---|---|
| Teaching Attitude | 64.99 | Rigorous and disciplined | 65.75 |
| | | Be full of lessons and be serious | 63.26 |
| | | Caring for students and strict requirements | 65.04 |
| Teaching content | 64.02 | Content is enriched, reflects the latest results, and the amount of information is moderate | 63.44 |
| | | The emphasis is high and the depth is appropriate | 63.86 |
| | | Meet the requirements of the syllabus | 64.63 |
| Teaching methods | 64.77 | The methods are varied and vivid | 65.63 |
| | | The cultivation of students' innovation ability is guided and guided | 63.95 |
| | | Good content, clear and systematic | 65.11 |
| | | Language standards, vivid, concise practice | 63.25 |
| | | Using artificial intelligence teaching technology and means to improve teaching method | 65.26 |
| Teaching effect | 66.66 | To mobilize students to learn enthusiasm and the atmosphere of the classroom | 65.48 |
| | | Students have comprehensive and enhanced ability | 67.63 |

## 3.3 Indicators of Quality of Civic and Political Education

### 3.3.1 Relevance of Civic Education Quality Indicator Elements

The raw data collected by the questionnaire were entered into SPSS software for finishing, summarizing and analyzing, and the research conclusions were drawn by statistically analyzing the correlation between the index elements as well as the reliability and validity test.

Table 5 shows the correlation analysis of the elements of the indicators for the evaluation of the quality of ideology and political education. After extracting the options of the questionnaire scale, the elements of the questionnaire were partially adjusted to avoid ambiguity of the title terminology and to standardize the conversion of the character type to the numerical type imported into the SPSS, which effectively ensured the external validity of the questionnaire of the indicator system. Pearson's product-difference correlation was used to analyze the correlation between the elements of the indicators for evaluating the quality of ideological and political education, and the correlation coefficients of all the indicators ranged from 0.363 to 0.536, and the P was less than 0.05, which indicated that the next step of the

analysis could be carried out.

*Table 5: The correlation between the evaluation index of the thought policy*

| Quality evaluation index elements | U1 | U2 | U3 | U4 |
|---|---|---|---|---|
| Teaching Attitude U1 | 1 | 0.363** | 0.522** | 0.536** |
| Teaching content U2 | 0.363** | 1 | 0.425** | 0.536** |
| Teaching methods U3 | 0.522** | 0.425** | 1 | 0.536** |
| Teaching effect U4 | 0.536** | 0.536** | 0.536** | 1 |

### 3.3.2 Reliability coefficients

Cronbach Alpha was used to test the reliability coefficients of the elements of the indicators for evaluating the quality of academic continuing education, and the validity was tested using exploratory factor analysis. The reliability coefficients are shown in Table 6, the total reliability coefficient is 0.806 and the validity coefficients of all elements are greater than 0.7, which indicates that the scale is trustworthy.

*Table 6: Reliability coefficient*

| Quality evaluation index elements | Reliability coefficient | Validity coefficient |
|---|---|---|
| Teaching Attitude | 0.775 | 0.736 |
| Teaching content | 0.776 | 0.716 |
| Teaching methods | 0.773 | 0.745 |
| Teaching effect | 0.736 | 0.856 |
| Total reliability | 0.806 | / |

### 3.3.3 Analysis of the average scores of the elements of the evaluation of the quality of Civic and Political Education

Collect the “questionnaire on the quality elements of Civic and Political Education”, convert the data into scores according to the binary semantic conversion, and finally get the average score of the first-level evaluation elements as shown in Table 7. The evaluation scores of teaching attitude, teaching content, teaching method and teaching effect are 4.873, 4.635, 4.728 and 4.633 respectively.

*Table 7: Average score*

| Quality evaluation index elements | Average score |
|---|---|
| Teaching Attitude | 4.873 |
| Teaching content | 4.635 |
| Teaching methods | 4.728 |
| Teaching effect | 4.633 |

The evaluation method synthesized by binary semantics and entropy weight method is applied, which corresponds to the rubric level V={excellent, good, moderate, poor}, and the semantic evaluation of SL colleges and universities is carried out. According to the evaluation of the evaluation team members and the analysis of the questionnaire research data, through the integrated calculation of binary semantics and entropy weight method, according to the principle of maximum affiliation, the data of the overall level of the second-level indicators are shown in Table 8. According to the principle of maximum affiliation, it can be obtained that the evaluation level of the second-level indicators mainly focuses on the excellent level,

of which there are five indicators belonging to the excellent level and four belonging to the good level. Taken as a whole, the overall level of the quality of Civic and Political Education in SL colleges and universities is “excellent”, which is at a better level in general.

*Table 8: The overall level of the secondary index*

| Secondary indicator | Excellence | Good | Fair | Poor |
|---|---|---|---|---|
| Rigorous and disciplined | 0.45 | 0.183 | 0.183 | 0.183 |
| Be full of lessons and be serious | 0.45 | 0.183 | 0.183 | 0.183 |
| Caring for students and strict requirements | 0.183 | 0.45 | 0.183 | 0.183 |
| Content is enriched, reflects the latest results, and the amount of information is moderate | 0.183 | 0.45 | 0.183 | 0.183 |
| The emphasis is high and the depth is appropriate | 0.45 | 0.183 | 0.183 | 0.183 |
| Meet the requirements of the syllabus | 0.183 | 0 | 0.634 | 0.183 |
| The methods are varied and vivid | 0.183 | 0.183 | 0.45 | 0.183 |
| The cultivation of students' innovation ability is guided and guided | 0.634 | 0.183 | 0.183 | 0 |
| Good content, clear and systematic | 0.183 | 0.817 | 0 | 0 |
| Language standards, vivid, concise practice | 0.183 | 0.45 | 0.183 | 0.183 |
| Using artificial intelligence teaching technology and means to improve teaching method | 0.183 | 0.183 | 0.45 | 0.183 |
| To mobilize students to learn enthusiasm and the atmosphere of the classroom | 0 | 0.183 | 0.817 | 0 |
| Students have comprehensive and enhanced ability | 0.45 | 0.183 | 0.183 | 0.183 |

### 3.3.4 Path to improve the quality of the Civics program

(1) Optimize the positioning of curriculum objectives

When designing the course objectives, we should adhere to the overall objective structure of “value, knowledge and ability”, and combine them with the social fields corresponding to the respective specialties, and then refine them into a specific objective system that can be operated and evaluated. When designing the knowledge, ability, emotion, attitude and value objectives of the courses, we should not simply add up the objectives of the courses and the objectives of the Civics and Political Science, but should precisely position the objectives of the courses and the ultimate objectives, and utilize the systematic thinking to design the overall design and implement it in a unified way.

(2) Accelerate the updating of content and embed Civic and Political thinking in the curriculum.

Teachers are the builders, developers and users of course content, and they should speed up the updating of their own knowledge system and transform new theories, developments and hot spots into course content. Curriculum content should not only conform to the logic of the evolution of subject knowledge, but also incorporate Chinese history and practice, and at the same time ensure the consistency between the logic of knowledge and the logic of students' cognition. Teachers should analyze the content of professional courses in depth, interpret it from the perspective of scientific and educational knowledge, and highlight the value of the course content in terms of knowledge, emotion, intention and action. In addition, in order to avoid the low-level construction of the contents of the courses, we can organize the exploration of the construction plan and guidelines for the professional courses, and provide teachers with teaching references and guidance.

(3) Integration of artificial intelligence technology, innovative teaching methods and

approaches

Postmodernist education advocates that the task of teachers is not only to impart knowledge, but to transform wisdom, help students recognize the relationship between various ideologies, power and knowledge, cultivate students' critical ability, and encourage the development of an equal dialogue between teachers and students. Teachers can only lead students to transform specialized knowledge and basic principles into mission power and profound reasoning through in-depth interaction between teachers and students, and through students' deep experience of learning and reasoning.

(4) Artificial Intelligence Enabled Curriculum Resource Construction

The use of artificial intelligence technology to promote the construction of three-dimensional curriculum resources. Three-dimensional curriculum resources can effectively assist offline teaching and support online or online-offline hybrid teaching. According to the course objectives, build online and offline stereoscopic course resources in accordance with the national first-class course construction standards.

(5) Improve relevant evaluation programs and evaluation indicators

Optimize the evaluation plan, explore an evaluation that attaches equal importance to "teaching" and "learning", and strengthen the effect evaluation of ideological and political "teaching" and "learning" in the evaluation plan. First, combining teachers' self-evaluation with school evaluation. Teachers can conduct self-evaluation through classroom questionnaires and communication with students. Schools can evaluate teachers through student questionnaires and quantitative scoring and teaching supervision. When designing evaluation indexes, teachers' ideological awareness, political consciousness, ability to design civics teaching and ability to educate people are added on the basis of the original indexes. Secondly, the formative evaluation of students is combined with the summative evaluation. In the design of evaluation indexes, whether it is process assessment or comprehensive assessment at the end of the semester, the evaluation indexes of values, ideological and moral cultivation, humanistic quality, scientific spirit and vocational quality should be added according to the characteristics of the courses on the basis of the indicators of the degree of achievement of teaching such as professional knowledge and ability.

# 4 Conclusion

This paper focuses on the evaluation of Civics classroom teaching quality. It adopts an approach that integrates subjective and objective attribute weights, using binary semantics together with the entropy weighting method to determine the comprehensive weights of the indicators, and then obtains the overall assessment value of the evaluated object through binary semantic arithmetic. Beginning with the multi-angle and multi-level characteristics of classroom teaching, the study constructs an evaluation index system for Civics teaching quality and assesses the quality of civic education through specific case analysis. Correlation analysis is carried out for the constructed indicator system, and the correlation coefficients of all indicators fall between 0.363 and 0.536, with p values below 0.05, indicating that further analysis can be conducted on this basis. Cronbach’s alpha and exploratory factor analysis are employed to test reliability and validity, respectively. The overall reliability coefficient reaches 0.806, while the validity coefficients of all elements are above 0.7, showing that the evaluation index system has acceptable trustworthiness. Teaching attitude, teaching content, teaching method, and teaching effect are all evaluated, and their scores are 4.873, 4.635, 4.728, and 4.633, respectively. Among these, the secondary indicators for SL colleges and universities are rated at the excellent level, including five indicators classified as superior and four classified as good. From the perspective of the overall assessment, the quality of civic

and political education in SL colleges and universities can be judged as “excellent,” indicating a comparatively good level in general. In response to the existing problems in the quality of Civic and Political Education, this study also proposes corresponding improvement paths and further refines the construction of the related evaluation scheme and indicator system.

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