

Research on the evaluation model of Ideological and political education of the spirit of the Communist Party of China based on Data Mining

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Abstract. The spirit of the Communist Party of China is formed in the practice of long-term revolutionary struggle. Carrying out the spiritual ideological and political education of the party is the spiritual pillar of building a socialist civilized society. The evaluation of Ideological and political education is the standard to measure the teaching effect of Ideological and political education. This paper studies the evaluation model of spiritual ideological and political education of the Communist Party of China based on data mining. Select the evaluation index of Ideological and political education and divide the index level. Based on data mining, the evaluation judgment matrix of Ideological and political education is constructed to determine the weight of evaluation index coefficient. Establish the evaluation model of Ideological and political education of the spirit of the Communist Party of China, and set the quality evaluation standard according to the closeness. Through the example application analysis, the evaluation model of Ideological and political education of the Communist Party of China based on data mining proposed in this paper has a good evaluation effect in the practical evaluation application.

Keywords: Data mining; Ideological and political education; The spirit of the Communist Party of China; Educational evaluation model; Evaluation index; Judgment matrix;

1. Introduction

The Communist Party of China has a history of 100 years. The tenacious spirit of the Communist Party of China is the goal of youth learning in the new era. Ideological and political education is not only an important way to enhance China's youth cultural identity, but also the need to build a cultural power [1]. Nowadays, ideological and political education has become an issue widely concerned by many scholars. To do a good job in the ideological guidance and value construction of the young generation, we need to pay attention to the role of Ideological and political education in teaching. The evaluation of Ideological and political education can promote the development of Ideological and political education, so as to better improve the educational concept of Building Morality and cultivating people [2]. In order to ensure the teaching quality of Ideological and political education, a reasonable index system is essential. Evaluating the teaching effect of Ideological and political education according to the index through rating is conducive to continuous exploration in practice, so as to make ideological and political education keep pace with the times and constantly explore and innovate. With the continuous upgrading of teaching means and the expansion of teaching forms, ideological and political education becomes flexible and diverse, This brings some difficulties to the evaluation of Ideological and Political Education [3]. Data mining algorithm is based on modern statistical theory. Its technology can reflect the relationship between the factors affecting ideological and political education and teaching quality, and make full use of the knowledge and experience of senior scholars to evaluate the teaching quality of Ideological and political education in Colleges and universities. Based on data mining, the evaluation model of Ideological and political education is established to evaluate and analyze the teaching effect of Ideological and political education in the spirit of the Communist Party of China, so that college teachers and many scholars can more accurately analyze the problems existing in Ideological and political education in Colleges and universities in China, and have a certain reference basis for timely improvement and adjustment of the problems, which has important practical significance.

2. Evaluation model of Ideological and political education of the spirit of the Communist Party of China based on Data Mining

2.1 Select the evaluation index of Ideological and Political Education

The evaluation of Ideological and political education in the spirit of the Communist Party of China is an important part of Ideological and political education. In order to give better play to the role of Ideological and political education in education, it is necessary to formulate evaluation principles for ideological and political education. The selected evaluation indicators need to be scientific and in line with the characteristics of Ideological and political education at the present stage. The indicators with reference standards should be standardized, and the indicators of little importance should be eliminated. In this paper, Delphi method is used to select the evaluation indicators of Ideological and political education. This method takes the research group as the center. First, clear prediction problems are put forward to scholars in the field of Ideological and political education, and then scholars give feedback. Scholars need to express their views independently and do not establish discussion contact with others. This method adopts the method of multiple investigations and repeated modification and summary, Finally, make all opinions converge [4]. Finally, this paper summarizes that the three aspects of background, process and results are primary indicators, and there are secondary indicators and tertiary indicators at the lower level.

The first level background evaluation index is selected according to the relevant environmental conditions of Ideological and political education in Colleges and universities. In the development of Ideological and political education, environmental factors affect students' subjective cognition of Ideological and political education. Therefore, under the background index, subjective and objective factors are fully considered, and three second level indexes of school environment, infrastructure and students' cognition are set. The process evaluation index is formed according to the feedback characteristics of Ideological and political education. Process evaluation measures the teaching process, can find the problems in the teaching process in time, and is conducive to solving the shortcomings of Ideological and political education. Among the secondary indicators, the implementation path is the most critical link in Ideological and political education, which is used to consider the effectiveness of Ideological and political education. Results the evaluation index is to measure and explain the expected objectives of Ideological and political education, and evaluate the completion. There are 9 secondary indicators defined in this paper. Due to the large number of tertiary indicators, there are 27 in total, so they are not shown in the figure.

2.2 Construction of evaluation judgment matrix of Ideological and political education based on Data Mining

Based on the data mining algorithm, this paper selects the cluster analysis method to build the model, and carries out the cluster analysis combined with the grey theory. This paper summarizes the gray level of the collected scattered data information, and judges the gray level category of the data information according to the whitening weight function. The gray level cluster analysis takes the point with the highest gray level as the center, so as to conduct gray level analysis on the blurred boundary and judge the gray level category, which can largely avoid the deviation of the evaluation results caused by subjective factors and prevent the omission of statistical information [5] 。 In order to determine the weight of the original data information of the evaluation object and avoid index deviation, a standardized evaluation matrix is constructed as follows:

$$W = \begin{bmatrix} w_{11} & w_{12} & \cdots & w_{1n} \\ w_{21} & w_{22} & \cdots & w_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ w_{i1} & w_{i2} & \cdots & w_{in} \end{bmatrix} \quad (1)$$

Where i is the number of evaluation indicators, n is the number of semesters participating in the evaluation, and W is the initial matrix for the evaluation of the teaching quality of Ideological and political education. Firstly, standardize the matrix. Since the teaching evaluation indicators of Ideological and political education are profit indicators, the data processing formula is:

$$e_{ab} = \frac{w_{ab} - \min(w_{ab})}{\max(w_{ab}) - \min(w_{ab})} \quad (2)$$

Where w_{ab} and e_{ab} are respectively the initial value of the b -th index in the a -th semester before data processing and the standard value after data processing, $\max(w_{ab})$ is the maximum value in the profitability index, and $\min(w_{ab})$ is the minimum value in the profitability index [6]. Due to the different importance of each index in the evaluation index of Ideological and political education, it is necessary to determine the corresponding weight $\lambda_b, b(b=1,2,\dots,i)$ of each index in the comprehensive cluster analysis. The comprehensive cluster analysis coefficient of the evaluation object $a(a=1,2,\dots,n)$ with respect to the ash class is calculated by the following formula:

$$\eta_a^k = \sum_{b=1}^u f_b^k(w_{ab}) \cdot \lambda_b \quad (3)$$

Where $f_b^k(w_{ab})$ is the whitening weight function of subclass k and λ_b is the index weight. The gray level category of data can be determined by calculating the cluster analysis coefficient.

2.3 Establishing the evaluation model of Ideological and political education of the spirit of the Communist Party of China

The ideological and political education of the spirit of the Communist Party of China involves many contents. Based on the BP neural network algorithm in the data mining algorithm, this paper establishes the evaluation model of Ideological and Political Education [7]. The model is divided into three layers of modules: input, output and hidden layer. The input of the input layer is set as x , and its output is:

$$Q_a^{(1)} = x(a), (a=1,2,\dots,n) \quad (4)$$

Where $Q_a^{(1)}$ is the output value of the output layer, the weight coefficient of the hidden layer is $\lambda_{ab}^{(2)}$, f is the mapping function, and the calculation formula of input and output is:

$$\begin{cases} net_a^{(2)}(k) = \sum_{b=1}^u \lambda_{ab}^{(2)} Q_a^{(1)}(k) \\ Q_a^{(2)}(k) = f[net_a^{(2)}(k)] \end{cases} \quad (5)$$

Where u is the number of samples. For the k -th sample, the actual output and network output are Q_u and Q_u^* respectively, and the error calculation formula is:[8]

$$E_u = \frac{1}{2} [Q_u(k+1) - Q_u^*(k+1)]^2 \quad (6)$$

Where d_b is the error value. The quality of Ideological and political education can be classified by using the value of closeness. The value range of closeness is between 0 and 1. closeness represents the degree of the ideological and political education level adjacent to the optimal value in the semester. Therefore, the greater the value of closeness, the higher the quality of Ideological and political education, and vice versa, According to the value range, when d_b is equal to 1 or 0 respectively, it is the highest quality and the lowest quality. The specific formula is:

$$d_b = \frac{G_b^-}{G_b^+ + G_b^-} \quad (7)$$

Where d_b and G_b^- are respectively the Euclidean distance between the b -th index and the maximum and minimum G_b^+ of the index. In order to further divide the quality level of Ideological and political

education, the level is divided into 4 levels according to the closeness. The closeness between 0.90-1.00 is the excellent level, the closeness between 0.8-0.89 is the good level, the closeness between 0.70-0.79 is the general level, and the rest is the poor level.

3. Case application analysis

Through sorting out the evaluation data of Ideological and political education in a university, this paper obtains the matrix of evaluation indexes of Ideological and political education, and tests the evaluation effect of Ideological and political education in a university according to the positive and negative ideals of each evaluation index. After processing the evaluation matrix of Ideological and political education, the positive and negative ideal solutions of each index are as follows:

Table 1. Positive and negative ideal solutions of each index

Index	X ₁	X ₂	X ₃	X ₄	X ₅
w ₁	0.0125	0.0428	0.0245	0.0457	0.0314
w ₂	0.0452	0.0316	0.0452	0.0234	0.02546
w ₃	0.0541	0.0254	0.0289	0.0538	0.03786
w ₄	0.1674	0.1043	0.0987	0.1312	0.1574
w ₅	0	0	0	0	0
Positive ideal solution	0.1674	0.1043	0.0987	0.1312	0.1574
Negative ideal solution	0	0	0	0	0

It can be seen from table 1 that in the positive ideal solution, both values come from the ideological and political education course in the fourth semester. It can be preliminarily judged that the teaching quality satisfaction of the ideological and political education course in the fourth semester is the highest. In order to obtain more accurate evaluation results, specific evaluation will be carried out below. After calculating the closeness value in the model, the closeness index and quality level of Ideological and political education teaching evaluation in five semesters are shown in Table 2.

Table 2. Evaluation and quality level of ideological and political education

Term	Quality Assessment Index	Closeness Degree	Quality Level
T ₁	0.885624	0.914	A+
T ₂	0.942156	0.957	A+
T ₃	0.482957	0.456	C
T ₄	0.852379	0.842	A
T ₅	0.807592	0.751	A-

It can be seen from table 2 that the quality index of Ideological and political education in the five semesters of the school has certain differences, the highest is about 0.942156, the lowest is only 0.482957, the first and second semesters belong to the excellent level, the third semester belongs to the poor level, and the fourth and fifth semesters are good grades. Obviously, due to the individual differences of college students, the judgment criteria are also different. There are certain differences in the evaluation of the teaching quality of Ideological and political education. Comparing the analysis results of this paper with the evaluation results of student satisfaction, the evaluation criteria are roughly the same as the student evaluation results. It can be determined that the overall ideological and political education effect of the university is good. The evaluation data of the above five semesters can accurately reflect the effect of Ideological and political education, and provide a practical basis for further strengthening ideological and political education and improving teaching quality. The consistency between the evaluation results and students' evaluation scores shows that

the evaluation model of Ideological and political education of the spirit of the Communist Party of China based on data mining is reasonable and effective in the evaluation of Ideological and political education.

4. Conclusion

Based on the data mining algorithm, this paper establishes the rating model of China's domestic ideological and political education of the party spirit. Firstly, the evaluation index of the evaluation model is selected, and then the data is processed through the cluster analysis method, the judgment matrix is constructed, the evaluation model is established, the teaching evaluation grade is set, and some results are achieved. At the same time, due to the limitations of practice and conditions, there are still many deficiencies in this study. The survey of students' satisfaction is more comprehensive and specific, so as to enrich the evaluation content and improve the evaluation model. The evaluation of Ideological and political education in this paper is more practical and practical. In the future research, we need to further study the basis of evaluation. We hope to continue to conduct in-depth and detailed research on rating indicators and evaluation standards on the basis of establishing the evaluation model of Ideological and political education, put forward more reasonable quantitative standards, make the reliability of evaluation indicators higher, and further develop relevant computer software to make the evaluation of Ideological and political education more standardized and scientific, It is more operable and improves the efficiency of Ideological and political education evaluation.

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