

# Construction of Crisis Warning Model of Ideological and Political Education for College Students

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**Abstract.** The crisis warning of college students' ideological and political education is subject to the non-linear development path, incomplete information collection, irregular data distribution and index design. Multi-level fuzzy comprehensive evaluation method can quantify the fuzzy concepts with unclear boundaries and clarify the hierarchy of complex factors that interact with each other, which is a way to carry out ideological and political development of college students. The operation step of multi-level fuzzy comprehensive evaluation method is to design the early warning process, establish index system, construct and run evaluation model for comprehensive warning results.

**Keywords:** Ideological and political education for college students; Crisis warning model; Fuzzy comprehensive evaluation method.

## 1 Introduction

In recent years, the crisis of college students has been frequently reported, there are not many people involved, but the negative effect is far-reaching and arouses public opinion. There will be wide attention from all walks of life, and public opinion is constantly questioning college education, especially the effectiveness of ideological and political education. The causes are complex and far beyond the control of a university, but they can be very complex. To a certain extent, the surface of ideological and political education system of Chinese university students is reflected impending crisis. In the past few decades, the rapidly changing external environment has been a great influence on students' thoughts and behaviors.<sup>[1]</sup>Due to the relative uncontrollability of the external macro environment. The hysteresis of ideas is the crisis of college students' ideological education at present. The early warning mechanism is relatively simple. This article concludes from the basic elements of ideological and political education. By means of fuzzy mathematics, the danger of ideological and political education of college students is constructed. Early warning system for minimizing the occurrence of all kinds of crisis events to provide new way of thinking and methods.

## **2 Feasibility analysis**

College students ideological and political education is subject to many complex factors, and the lack of abnormal changes to any of them. Accurate prevention can cause the results to deviate from or even deviate from the predication. Therefore, the factors on ideological and political education for college students need warning.

Fuzzy comprehensive evaluation method is a young but rapidly developing fuzzy mathematical method.<sup>[2]</sup>It aims to establish a system of indicators and then score according to experts. Combined with quantitative index, the weight matrix and conversion matrix are established to be subjected to a variety of factors that restrict things or objects to make an overall evaluation for nonlinear forecast, with clear results, systematic strong and other characteristics which have great advantages on problems with the complexity of business and the fuzziness of human thinking.

## **3 Warning process design**

College students' ideological and political education crisis warning should follow strict operation process, including four basic links: (1) Collection of early warning information. The operation of the ideological and political education system of college students is not only affected by the relatively uncontrollable external environment, but also restricted by the relatively controllable internal factors. The former roughly includes politics, economy, culture, society, nature, academic subfactor set.<sup>[3]</sup> The latter mainly involves the index set of subject, object, ring body (here refers to micro-environment such as school and family in a narrow sense), intermediary and so on. Not every information in these sub-factor sets and indicator sets is useful for the construction of crisis early warning model. However, in the initial stage of model construction, such information should be collected as widely as possible so as to comprehensively identify crisis factors. Scientific screening of early warning indicators and establishment of effective early warning model lay a good foundation.(2) Screening of warning factors and indicators. On the basis of full possession of early warning information, in-depth analysis and identification of various risk factors in the external environment, repeated comparison, the selection of the most representative factors, the determination of various key indicators, clear index connotation and quantitative ways, early warning index system can be established.(3) Construction and operation of early warning model. The factor set is determined and subdivided into several sub-factor sets. Then the comment set and weight allocation fuzzy subset are established to determine the weight of factors.<sup>[4]</sup>Finally, the model is run for data processing.(4) Analysis of the results of the early warning model. According to the results of model operation, early warning experts precipitate comprehensive early warning results and propose specific crisis management measures according to the results.

## **4 Model design**

### **4.1 Screening of early warning indicators**

On the basis of extensive collection of early warning information, selecting the most representative early warning index scientifically and reasonably is the premise of establishing early warning index system. In the screening process of alarm indicators, the following basic principles should be followed:

One is the combination of completeness and refineness. Factors affecting the operation of the ideological and political education system of college students involve all aspects. The selection of indicators should be comprehensive, especially the important aspects should not be omitted. However, if we blindly increase the number of indicators to meet the completeness of the index system, it will inevitably have a sense of piling up and increase the cost of early warning. Therefore, it is necessary to take into account the principle of refinement and try to select the most representative indicators. Second, combine science with feasibility.<sup>[5]</sup>The operation mechanism of the ideological and political education system of college students is very complicated. Only by scientific index design can we effectively reveal its nature, characteristics, relations and internal laws of the movement process. However, some scientific indicators may be unable to be collected for various reasons or difficult to be implemented in practice. Therefore, the operability of data sources and index calculation methods should be fully considered in the selection of indicators. Third, the combination of objectivity and subjectivity. It is the purpose of scientific research to keep the indicators as objective as possible. However, the ideological and political education of college students is a complex social phenomenon, and its process and results are inseparable from the measurement of subjective indicators such as cognition, emotion and satisfaction. In addition, the same objective indicators may cover up different subjective attitudes, and different objective indicators will also cover up the same subjective attitudes.<sup>[6]</sup>

### **4.2 Construction of early warning index system**

According to the above basic principles, on the basis of carefully precipitation of a large number of domestic and foreign literature research results, combined with years of experience in typical cases and work experience, and after repeated collective discussion by the members of the research group, according to the ideological and political education structure elements, the author listed a total of 20 primary early warning indicators and alternative early warning indicators from the four aspects of ring, subject, object and intermediary. In addition, a blank column of warning indicators was reserved for experts to supplement.<sup>[7]</sup> Then, 6 experts were selected for three rounds of questionnaire consultation according to the operation procedure of Delphi method. Before the consultation, I introduced the relevant background information and methods of the research project to the experts in detail, made clear the basic principles of index selection, and made a detailed explanation of the unusual indicators, to ensure that the experts are fully understanding the will of my research on the basis of independent evaluation. In the consultation process, if the primary early warning indicator, alternative early warning indicator and new indicator proposed by experts get more than 60% of the expert assignment, this indicator will be formally included, otherwise it will be eliminated, and its assignment will be

allocated to other selected indicators in a certain proportion, and finally the revised early warning indicator system will be obtained.<sup>[8]</sup>

**Table 1.** Index system

Species	Index	Value
U1	School spirit	0-100
	Class cohesion	0-100
	Type of family education	0-100
U2	Equipping ratio	0-100
	Specialization rate	0-1
	Work pressure	0-100
U3	Teaching level	0-100
	School belonging	0-100
	Life satisfaction	0-100
	Interpersonal satisfaction	0-100
	Integrity	0-100
	Social responsibility	0-100
	Attendance rate of ideological and political courses	0-1
	Failure rate of ideological and political courses	0-1
	Participation rate in social practice	0-1
	Violation rate	0-1
U4	The directionality of thought transmission	0-100
	The power of thought transmission	0-100
	The effectiveness of educational methods	0-100
	The rationality of the leadership system	0-100

### 4.3 Construction of early warning index system

Let R be ideological and political education crisis for college students which is influenced by 6 sub-factors.

$W = \{W_1, W_2, W_3, W_4, W_5, W_6\}$  represents the set of sub-factors. They indicate political environment, economic environment, cultural environment, social environment, natural environment, academic environment respectively.<sup>[9]</sup>

$U = \{U_1, U_2, U_3, U_4\}$  represents the index set.

$E = \{E_1, E_2, E_3, E_4, E_5, E_6\}$  represents the expert set.

$V = \{v_1, v_2, v_3, v_4, v_5\}$  indicates the set of comments. They represent optimum, good, low risk, high risk, crisis. The corresponding measures are different.

Let  $x_{ij}$  be the comments of expert  $E_j$  on  $W_i$ .  $0 \leq x_{ij} \leq 1$ . We can have the following table.

**Table 2.** The comments of the experts

Factors	$E_1$	...	$E_6$
$W_1$	$x_{11}$		$x_{16}$
$W_2$	$x_{21}$		$x_{26}$
$W_3$	$x_{31}$	...	$x_{36}$
$W_4$	$x_{41}$		$x_{46}$
$W_5$	$x_{51}$		$x_{56}$
$W_6$	$x_{61}$		$x_{66}$

The influence of each factor on R can be calculated from the above table.

We can obtain the comments  $y_{ij}$  of expert  $E_j$  on index  $u_i$  in the same way.

The influence of each index on sub-factor can be calculated. The same way can we computed the influence of  $u_i$  on  $W_i$ . The comments and their measures are listed below:

**Table 3.** Rank of comments

Index	Status	Measures
$v_1$	Optimum	-
$v_2$	Good	-
$v_3$	Low risk	Moderate monitoring
$v_4$	High risk	Strengthen monitoring
$v_5$	Crisis	Risk management

Let  $0 \leq p_{ij} \leq 1$  be the degree of the ideological and political education state of college students of  $u_i$  on  $v_j$ .

The weight matrix and conclusion matrix can be computed according to the equations below:

$$A = (\sigma_1, \sigma_2, \dots, \sigma_{20}) \quad (1)$$

$$B_j = \sum_{k=1}^{20} \sigma_k \times p_{kj} \quad (2)$$

Due to the large subjectivity of the evaluation process, in order to avoid too large deviation between the results and reality and reduce the incidence of false alarms, we calculated the upper limit of the comment set when drawing the final results.

We have  $V = \{100, 80, 60, 40, 20\}$ .  $R = B \cdot V^T$ . The warning results can be represented by computing  $R$ , if  $40 \leq R < 60$ , it means low risk; if  $20 \leq R < 40$ , it indicates high risk; if  $0 \leq R < 20$ , the crisis occurs.

## 5 Conclusion

This model emphasizes the combination of qualitative and quantitative analysis, and in view of the characteristics that crisis factors cannot be fully quantified in ideological and political education of college students, it utilizes the knowledge, experience and objective data of experts and quantifies them through expert scores, which greatly improves the credibility of early warning and the feasibility of practical application. Effectively enhance the ability to monitor and predict the crisis of college students' ideological and political education. However, due to different types and levels of colleges and universities on the ideological and political education crisis factors there are certain differences in the value of the comments set, coupled with the current objective evaluation mechanism of the ideological and political education of college students is not perfect, all these to a certain extent, directly or indirectly affect the correctness of the warning results.<sup>[10]</sup>When dealing with practical problems, we should make specific analysis according to the specific characteristics of ideological and political education in target universities, adopt different weight matrix and comment set, reduce false alarm rate and false alarm rate as far as possible, improve the accuracy of early warning, so as to truly achieve the purpose of early warning crisis of ideological and political education in college students.

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