



BioTechnology

An Indian Journal

FULL PAPER

BTALJ, 10(5), 2014 [1268-1273]

Fuzzy comprehensive evaluation-based university ideological and political education interactive process research

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ABSTRACT

China implements dream of China and a strong military, while country also puts more emphasis on universities students' ideological and political education activities. University students are the future of a country, the hope of a nation. Their ideological and political education is the guarantee for the national long-term stability. By far, universities ideological and political education interactive process has being proceeded. The paper takes Beijing universities, Shanghai universities, Guangzhou universities and Dalian universities as research objects, makes use of fuzzy comprehensive evaluation method, evaluates four regions university ideological and political interactive process quality from interactive process design, system and mechanism design, interactive management mode, staff participation degree, target coordinate ability, work coordinate ability, emergency response ability these seven perspectives, and further gets conclusion that best ideological and political education interactive process is Beijing universities, secondly is Shanghai universities. Guangzhou universities and Dalian universities are basically on the same level.

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KEYWORDS

Ideology and politics;
Educational interaction;
Fuzzy evaluation;
Mathematical model;
Universities.

INTRODUCTION

University students are front group of social new ideas; they can accept novelty at the fastest speed. To country and society, carry on university students' ideological and political education is particularly important. Nowadays, each university is also studying ideological and political education activities new forms.

In 2013, Cheng Jing in the article "University students ideological and political several problems research since opening-up and reform", she took different periods' university students possessed different ideological and political education features as evidence, took uni-

versities political lesson reformation as research objects, analyzed Chinese universities ideological and political education exploring and reforming process for thirty years since opening-up and reform. The article pointed out that after opening-up and reforming, basic experiences and important enlightenment reflected university students' ideological and political education basic rules.

In 2004, Liu Ye in the article "Modern ideological and political education process research", he established ideological and political education process theoretical system from the abstract to the concrete. The author interpreted modern ideological and political education process from cultural philosophy, communication phi-

losophy and development philosophy the three perspectives. The article pointed out that ideological and political education process was the process of inheriting, spreading, and creating moral culture, was also communication interactive process, even was process that reflected sustainable development. The article highlighted in whole ideological and political education process, it had rules that education and self-education coexistence and dialectical unity.

In 2009, Li Guo-Ying in the article "Ideological and political education interactive theoretical research", he researched on ideological and political education interactive types, interactive principles and interactive process. The article pointed out that ideological and political education interactive process was a process that needed two parties' active participation, during the process, the two parties mutual effected on each other, implemented self-surpassing, the two parties were inter-subjectivities, timely fed back relative information. The author provided "subject-object-subject" ideological and political education mode.

In 2013, Li Hong-Chang in the article "Ideology and politics teachers' practice wisdom problems and measures research", took unique values that implemented ideological and political teaching's teachers and students' interaction and impelled new curriculum reformation as objects, researched modern ideological and political education teaching theoretical new ideas and new concepts by combining with practice, deeply analyzed current ideological and political education main problems

causes, and targeted proposed corresponding solutions.

The paper will take Beijing, Shanghai, Guangzhou and Dalian these four cities' universities as research objects, it researches university students ideological and political education process from interactive process design, system and mechanism design, interactive management and others totally seven perspectives.

MODEL ESTABLISHMENT

University students' ideological and political education interactive process is focus of numerous teachers. Interactive process quality will directly effect on students' learning level and ideological and political quality. The interactive process needs teachers' meticulous designing and students' positive participation. Factors that impact on interactive education are interactive process design, system and mechanism design, interactive management mode, staff participation degree, target coordinate ability, work coordinate ability, and emergency response ability. The paper will establish comprehensive evaluation model for the seven influence factors.

Data processing

Organize random sample investigation in Beijing, Shanghai, Guangzhou and Dalian four cities, respectively randomly draw 100 university students and 100 teachers from the four regions, ask them to score the ideological and political education process involves seven factors, full score is 100 scores. The seven fac-

TABLE 1: Factor definition

Influence factor	Factor Definition
Interactive process design	It includes interactive purpose, implementation schemes, activities rules, activities budgeting.
System and mechanism design	Arrangement on people, wealth and material as well as mechanism setting
Interactive management mode	Interactive activities executors' selection, testing
Staff participation degree	Thereby reflects staff organization status
Target coordinate ability	For long-term, short-term targets, it makes reasonable coordination and timely corrects deflected targets.
Work coordinate ability	It includes school, institutes, and departments' cooperation, and forward, medium and post periods' work coordination.
Emergency response ability	It refers to solution on interactive process occurred unexpected issues.

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tors are interactive process design, system and mechanism design, interactive management mode, staff participation degree, target coordinate ability, work coordinate ability, and emergency response ability, do equalization processing with data, it can get data as TABLE 2, the seven factors definitions are as TABLE 1.

In order to easy taking preliminary comparison of original data, we draw broken line graph, as Figure 1 show. From Figure 1, we only can roughly see that each city each factor scoring status, therefore we cannot use direct comparison to look for the best city in ideological and political education interactive process.

TABLE 2 : Original data

	Beijing	Shanghai	Guangzhou	Dalian
Interactive process design	73	62	48	55
System and mechanism design	93	95	89	83
Interactive management mode	69	72	81	62
Staff participation degree	93	82	85	89
Target coordinate ability	73	81	61	75
Work coordinate ability	91	82	73	69
Emergency response ability	72	84	70	68

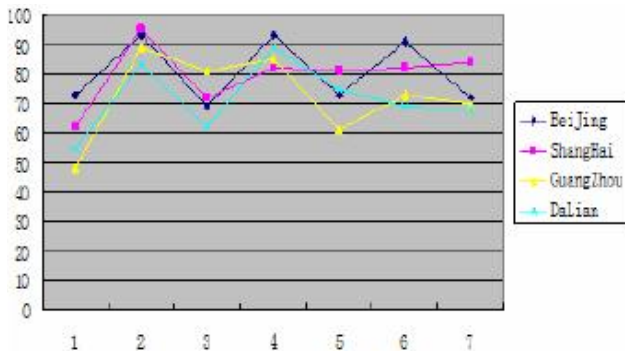


Figure 1 : All objects comparison chart

Fuzzy comprehensive evaluation

In general, fuzzy comprehensive evaluation involves three quantities. Set that there are n pieces of evaluated objects' correlation factors, it records as $U = \{u_1, u_2, \dots, u_n\}$, and calls it as factor set. And set all possible occurred remarks have m pieces, it records as $V = \{v_1, v_2, \dots, v_m\}$, and calls it as evaluation set. Because every factor position is different, its function is also different, it appears measurement criterion that is weight, and it records $A = \{a_1, a_2, \dots, a_n\}$.

Comprehensive evaluation steps

Fuzzy comprehensive evaluation steps are proceeding as following methods:

- (1) Define factor set $U = \{u_1, u_2, \dots, u_n\}$.
- (2) Define evaluation set $V = \{v_1, v_2, \dots, v_m\}$.

- (3) Carry out single factor evaluation and get $r_i = \{v_{i1}, v_{i2}, \dots, v_{im}\}$.

- (4) Construct comprehensive evaluation matrix:

$$R = \begin{bmatrix} r_{11} & r_{12} & \dots & r_{1m} \\ r_{21} & r_{22} & \dots & r_{2m} \\ \vdots & \vdots & & \vdots \\ r_{n1} & r_{n2} & \dots & r_{nm} \end{bmatrix} \tag{1}$$

- (5) Comprehensive evaluation: to weight $A = \{a_1, a_2, \dots, a_n\}$, calculate $B = A \circ R$, and need to make evaluation according to maximum membership principle.

Operator definition

When make comprehensive evaluation, according to operator \circ different definitions, it has different models.

- (1) Model I: $M(\wedge, \vee)$ —— Principal divisor decisive type

Computing method is

$$b_j = \max\{a_i \wedge r_{ij} | i = 1, 2, \dots, n\} (j = 1, 2, \dots, m) \tag{2}$$

The model evaluation result is up to factors that play main effects on total evaluation, other factors will not impact on evaluation, relatively, the model is fit for the case that comprehensive evaluation is thought to be optimal when single evaluation is optimal.

- (2) Model II: $M(\bullet, \vee)$ —— Principal divisor promi-

ment type

Computing method is

$$b_j = \max\{a_i \bullet r_{ij}, i = 1, 2, \dots, n\} (j = 1, 2, \dots, m) \tag{3}$$

The model has some similarities with I model, but it is more refining than I model. It not only highlights main factors, but also gives considerations to other factors. The model is fit for the range that model I is inapplicable, which is also in case that each factor cannot be distinguished but needed to be refined.

(3) Model b!: $M(\bullet, +)$ —— Weighted average type
Computing method is

$$b_j = \sum_{i=1}^n a_i \bullet r_{ij} (j = 1, 2, \dots, m) \tag{4}$$

The model according to each factor importance, take all influence factors into consideration, relatively it is fit for the case that requires comprehensive optimization.

(4) Model IV: $M(\wedge, \oplus)$ —— Taking sum of small upper bound type
Computing method is

$$b_j = \min\left\{1, \sum_{i=1}^n (a_i \wedge r_{ij})\right\} (j = 1, 2, \dots, m) \tag{5}$$

When use the model, it should pay special attention to: every a_i cannot take excessive big value, otherwise it may appear the case that b_j is 1; Every a_i cannot take excessive small value, otherwise it will appear the case that b_j is equal to the sum of each a_i , which will lead to single factor evaluation relative information lose.

(5) Model V: $M(\wedge, +)$ —— Balanced average type
Computing method is

$$b_j = \sum_{i=1}^n \left(a_i \wedge \frac{r_{ij}}{r_0} \right) (j = 1, 2, \dots, m) \tag{6}$$

Among them, $r_0 = \sum_{k=1}^n r_{kj}$. The model is fit for com-

prehensive evaluation matrix R element is excessive big or small cases. The paper established model uses principal divisor decisive type's operator.

Establish process

The paper through considering Chinese four cities(Beijing, Shanghai, Guangzhou, Dalian) universities ideological and political education activities' evaluation problems, it looks for Chinese universities ideological and political education interactive process rules. Therefore, we need to establish the problem factor set $U = \{u_1, u_2, u_3, u_4, u_5, u_6, u_7\}$, from which u_1 represents interactive process design status, u_2 represents system and mechanism design status, u_3 represents interactive management code, u_4 represents staff activities' participation status, u_5 represents target coordinate status, u_6 represents interactive process each work coordinate status, u_7 represents process emergency response ability. Due to make comparison of four cities, it needs to standardize TABLE 2 data as TABLE 3.

By referencing the article "Universities campus culture construction as well as ideological and political research", we get the seven influence factors weights, as TABLE 4 show.

By TABLE 4 data, it is clear that work coordinate ability is most important, in order to full reflect weight importance, it normalizes weights, data is as TABLE 5, and draws pie graph as Figure 2 show.

TABLE 3 : Horizontal standardized data

	Beijing	Shanghai	Guangzhou	Dalian
Interactive process design	0.31	0.26	0.20	0.23
System and mechanism design	0.26	0.26	0.25	0.23
Interactive management mode	0.24	0.25	0.29	0.22
Staff participation degree	0.27	0.23	0.24	0.25
Target coordinate ability	0.25	0.28	0.21	0.26
Work coordinate ability	0.29	0.26	0.23	0.22
Emergency response ability	0.24	0.29	0.24	0.23

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TABLE 4 : Severn factors weights

Factor	Weight	Rank
Interactive process design	0.2	3
System and mechanism design	0.7	2
Interactive management mode	0.2	3
Staff participation degree	0.7	2
Target coordinate ability	0.2	3
Work coordinate ability	1.0	1
Emergency response ability	0.2	3

TABLE 5 : Weights table after normalization

Factor	Weight	Rank
Interactive process design	0.06	3
System and mechanism design	0.22	2
Interactive management mode	0.06	3
Staff participation degree	0.22	2
Target coordinate ability	0.06	3
Work coordinate ability	0.31	1
Emergency response ability	0.06	3

In Figure 2 and following charts, “1” represents interactive process design status, “2” represents system and mechanism design status, “3” represents interactive management code, “4” represents staff activities’ participation status, “5” represents target coordinate status, “6” represents interactive process each work coordinate status, “7” represents process emergency response ability.

From TABLE 5, it is clear that this evaluation universities ideological and political interactive process used weight is

$$A = (0.06, 0.22, 0.06, 0.22, 0.06, 0.31, 0.06)$$

According to TABLE 3 data, establish comprehensive evaluation matrix:

$$R = \begin{bmatrix} 0.31 & 0.26 & 0.20 & 0.23 \\ 0.26 & 0.26 & 0.25 & 0.23 \\ 0.24 & 0.25 & 0.29 & 0.22 \\ 0.27 & 0.23 & 0.24 & 0.25 \\ 0.25 & 0.28 & 0.21 & 0.26 \\ 0.29 & 0.26 & 0.23 & 0.22 \\ 0.24 & 0.29 & 0.24 & 0.23 \end{bmatrix}$$

Take model I— $M(\wedge, \vee)$ as evident, calculate weight and get:

$$B = A \circ R = (0.91, 0.82, 0.73, 0.7)$$

Therefore, Beijing universities ideological and po-

litical education interactive process is more outstanding than other three cities; result is as Figure 3 shows.

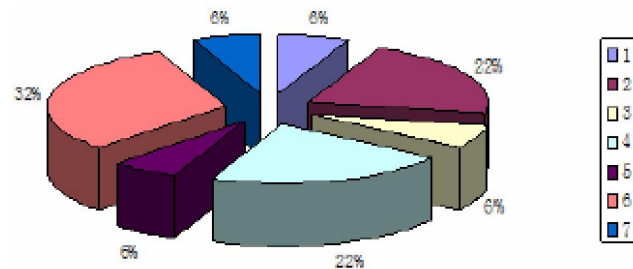


Figure 2 : Weight chart

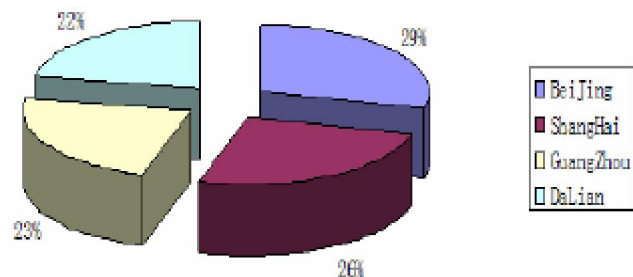


Figure 3 : The results figure

From Figure 3, we can see that best ideological and political education interactive process is Beijing universities, secondly is Shanghai universities. Guangzhou universities and Dalian universities are basically on the same level.

Analysis result

Figure 4 is Beijing each indicator occupied distribution diagram, its distribution is relative even, three higher proportions items are consistent to three higher proportions items in weight figure, so Beijing universities ideological and political education interactive activities quality is higher. Therefore, we easily find that cities with higher ideological and political education interactive activities quality, their each indicator distribution gets closer to weight distribution.

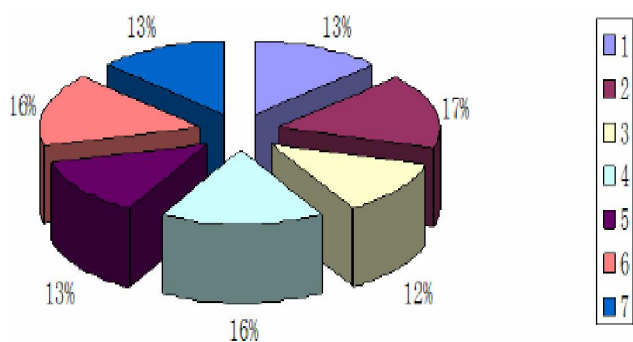


Figure 4 : Beijing scale drawing of the indicators

CONCLUSION

The paper used fuzzy comprehensive evaluation method generally will solve a kind of arrangement and selective difficulties. The key to whole process is establishing fuzzy comprehensive evaluation matrix. The matrix compositions are evaluation results of single element. Readers can give weights by themselves according to experiences or reference other documents data. But once weight is unreasonable, it will lead to wrong computing process and impact on results.

Beijing as Chinese capital is national center of politics, culture and economy. Beijing universities due to its good geographical positions, it has numerous educational resources. Shanghai is international metropolis, is also one of Chinese four main municipalities. Guangzhou and Dalian are similarly overseas cities, ideas are relative open, and they have relative faster acceptance degree on novelty. The paper evaluation result is that best ideological and political education interactive process is Beijing universities, secondly is Shanghai universities. Guangzhou universities and Dalian universities are basically on the same level. Thereupon, the paper evaluation result conforms to practice.

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