Discuss micro-cultures impacts on university students' ideology and politics under analytic hierarchy process

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ABSTRACT

With the acceleration of living rhythm, "micro" has gradually become the new vocabulary of style. University students are group with most vogue vitality, and surely "micro" brought changes is indispensible in their ideological and political education process. Around them, micro blogging, micro-channel, micro public good are visible all over. The paper takes university students as research objects; it selects micro-cultures representative micro blogging, micro-channel, micro public good the three ways to research on micro-cultures impacts on university students' ideology and politics. The research utilizes analytic hierarchy process, and goes ahead with five aspects they are impact on ideology, the convenient case of student exchanges, side-effect influences, and propaganda of activities and leading role of students, research results show that micro public good is the deepest impact way on university students' ideology and politics that is worthy recommending.
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KEYWORDS

Micro-cultures;
University students;
Ideology and politics;
Analytic hierarchy process;
Micro public good.

INTRODUCTION

In the numerous and complicated era, micro-cultures has being quietly changed people's life. Micro blogging, micro-channel, micro public good and others a series of micro-cultures thoroughly reflects people's inward world. University students as fashion trend representative varieties of people, their every step keeps up with fashion pace. Micro blogging, micro-channel and others micro-cultures can be played among them to the greatest level. These micro-cultures have also become a way in school's ideological and political education lessons.

In 2013, Zhao Xin in the article "Micro-channel to University students' ideological and political education impacts and measures research", she took university students as research objects, and made research on educational objects, education carrier as well as other multiple aspects problems. The article pointed out existence of micro-channel impelled life-oriented ideological and political education, it could let contemporary students to full exert their subjective initiatives. Meanwhile, micro-channel caused anomic problems, moral violation and others a series of problems had generated serious challenges for university students ideological and political education.

In 2013, Ji Hai-Ju in the article "New media age universities ideological and political education research",

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she adopted multiple kinds of research methods, comprehensive stated in the background of new media age, universities ideological and political education basic elements, reformation areas and evaluation mechanism as well as other contents. The article pointed out current universities ideological and political education confronted to double reality backgrounds.

In 2012, Sun Shan in the article "New media to university students ideological and political education impacts and measures research", she took new media as research objects, stated new media to university student ideological and political education impacts from macro and micro two perspectives. The article pointed out that new media had openness and diversity features, such features were beneficial to students strengthen ideological and political learning while new media emergence let ideological and political education effectiveness to be remarkable improved.

In 2013, Lee Li in the article "University students ideological and political education problems and measures research under micro-culture backgrounds", she took contemporary university students as research objects, and researched on university students' political education theory, political education status, political education effective measures under micro-cultures background. The article pointed out that to university students' ideological and political education, micro-cultures were both opportunities and challenges. Took micro-cultures as knowledge spreading carriers, students were easier to accept. It was another kind of ways that combined theory with practice, its emergence was more beneficial to update educational concept.

The paper will make research on micro-cultures' micro blogging, micro-channel, and micro public good three kinds of ways, by multiple aspects comparing, it finds out micro-cultures deepest impact way on university students' ideological and political education.

MODEL ESTABLISHMENT

AHP principles

AHP can solve relative tedious and vague problems' decision-making problems. Use the method to construct model, it roughly needs four steps :
1) Establish hierarchical structure scheme;

2) Construct every layer that fully used in judgment matrix;
3) Hierarchical single arrangement and consistency test;
4) Hierarchical total arrangement and consistency test;

In the following, it respectively states each step detailed process.

Hierarchical structure

AHP solved problems are required to be hierarchic, orderly and logic. Only then it can construct hierarchical scheme. Let tedious problems' elements to form into multiple hierarchies according to its attributes, membership and its relations. Last hierarchical element plays a dominate role in next hierarchical relative elements. In general, these hierarchies can be divided into 3 types:
(1) Top layer: Only one element in this hierarchy, it normally is final target of analytic problems. The layer is also called target hierarchy.
(2) Middle hierarchy: In this hierarchy, it includes intermediate links that get involved to fulfill targets, which can be composed of some hierarchies that include multiple and multilayer criterions that required to consider. It can also be called criterion hierarchy.
(3) The bottom hierarchy: This hierarchy includes optional each method and way to fulfill targets. It can also be called measure hierarchy or scheme hierarchy.

Hierarchy numbers in hierarchical structure have something to do with problem's complicated degree as well as analysis detailed requirements, normally the hierarchy numbers are not limited, each element in every hierarchy governs less than 9 elements. Hierarchical
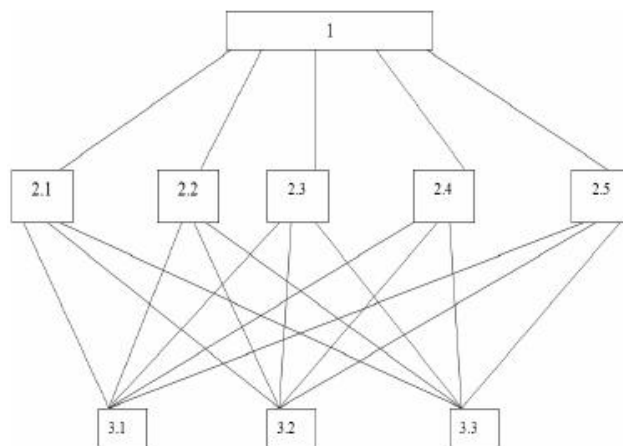

Figure 1 : Hierarchical structure chart

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structure is as Figure 1.

In Figure 1, layer 1 is target layer that is the purpose which is required to finally fulfill for researching problems, layer 2 is criterion layer that is the medium process that researching problems go through, layer 3 is scheme layer that is each kind of referencing schemes.

Judgment matrix construction

Each layer structure can show factors relationships, but in middle layer, each factor occupied proportion in target evaluation basically will not be fully the same, in the heart of evaluators, each factor has certain proportions.

When define each factor proportion that is to compare n pieces of factors $X = \{x_1, \cdots, x_n\}$ to factor Z impacts. *Saaty* and others proposed to carry out paired comparison among factors, and constructed comparison matrix method. That is to say, it selects two factors x_i and x_j every time, uses a_{ij} to express x_i and x_j to Z impacts ratios, all comparison is using matrix $A = (a_{ij})_{n \times n}$ to express, A has become judgment matrix between $Z - X$. From matrix, it is clear that if x_i and x_j to Z impact ratio is a_{ij}, tthen x_j and x_i to Z impact ratio is $a_{ji} = \dfrac{1}{a_{ij}}$.

According to linear algebra theoretical knowledge, if matrix $A = (a_{ij})_{n \times n}$ meets $a_{ij} > 0$ and $a_{ji} = \dfrac{1}{a_{ij}} (i, j = 1, 2, \cdots, n)$, then matrix A is positive reciprocal matrix.

a_{ij} value determination can according to scale table, contents are as following TABLE 1:

TABLE 1: Scale table

Scale	Definition
1	Indicates two factors have equal importance by comparing
3	Indicates the former is slightly more important than the later by comparing two factors
5	Indicates the former is obviously more important than the later by comparing two factors
7	Indicates the former is intensely more important than the later by comparing two factors
9	Indicates the former is extremely more important than the later by comparing two factors
2, 4, 6, 8	Indicates middle level of above judgment
Reciprocal	If importance ratio between i and j is a_{ij}, then importance ratio between j and i is $a_{ji} = \dfrac{1}{a_{ij}}$.

Judgment matrix construction

Judgment matrix A corresponding maximum feature value $\lambda_{\max}$ feature vector W, it is the priority weight of same hierarchy corresponding elements relative importance to last hierarchy some element after normalization, the process is called hierarchical single arrangement. Though the process can reduce other factors interference, it is hard to avoid appearing inconsistency to some extent when integrate all comparison results. If comparison results are consistent, then A factor should also meet:

$$a_{ij}a_{jk} = a_{ik}, \forall i, j, k = 1, 2, \cdots, n \qquad (1)$$

The positive reciprocal matrix that meets above formula is called consistent matrix. To easy define A can be accepted or not, it should test A inconsistency is very serious or not.

If A is consistent matrix, then

① A surely is positive reciprocal matrix.

② Transposed matrix A^T is consistent matrix.

③ A matrix any two lines are in proportions, and factors are above 0, therefore $rank(A) = 1$, so is the column.

④ In A, $\lambda_{\max} = n$, n is matrix order number. Other features roots of A is 0.

⑤ $\lambda_{\max}$ corresponding feature vector

$$W = (w_1, \cdots, w_n)^T, \qquad \text{then}$$

$$a_{ij} = \frac{w_i}{w_j}, \forall i, j = 1, 2, \cdots, n, \text{ so}$$

$$A = \begin{bmatrix} \frac{w_1}{w_1} & \frac{w_1}{w_2} & \cdots & \frac{w_1}{w_n} \\ \frac{w_2}{w_1} & \frac{w_2}{w_2} & \cdots & \frac{w_2}{w_n} \\ \vdots & \vdots & \vdots & \vdots \\ \frac{w_n}{w_1} & \frac{w_n}{w_2} & \cdots & \frac{w_n}{w_n} \end{bmatrix} \qquad (2)$$

A is n order positive reciprocal matrix, when it is consistent matrix, when and only when $\lambda_{max} = n$ as well as when A is inconsistent, it surely has $\lambda_{max} > n$. Thereupon, use λ_{max} and n relationship to test whether A is consistent matrix or not.

A Consistency test steps:

Calculate consistency indicator CI,

$$CI = \frac{\lambda_{max} - n}{n - 1} \qquad (3)$$

Consult corresponding average random consistency indicator RI. *Saaty* Researched RI value, value could refer to TABLE 2.

TABLE 2 : RI value

n	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45

RI Value is got in this way that randomly constructs 500 sample matrixes. Random select numbers from 1 to 9 as well as its reciprocals to construct positive reciprocal matrix, and determine average value of maximum feature root λ'_{max}, and define

$$RI = \frac{\lambda'_{max} - n}{n - 1} \qquad (4)$$

TABLE 3 : Five factors impacts status

	Number of people	Percentage (%)	Rank
Leading role of students	103	51.5	1
The impact to ideology	94	47	2
Propaganda of activities	86	43	3
The convenient case of student exchanges	45	22.5	4
Side effects impact	21	10.5	5

Solve consistency ratio CR

$$CR = \frac{CI}{RI} \qquad (5)$$

When $CR < 0.10$, it is thought that A consistency is acceptable, otherwise it should make proper correction.

In the process, it also includes hierarchical total arrangement and consistency test, due to article lengths are limited, no theoretical statements here, directly apply it in the following.

Best micro-cultures model establishment

Hierarchical structure chart establishment

With an aim to look for best way to micro-cultures, therefore in the paper target layer factor should be best micro-cultures way. By referencing lots of relative documents, university students ideological and political education influence factors roughly divide into five that are the impact to ideology, the convenient case of student exchanges, generated side effects, propaganda of activities and leading role of students. Therefore, criterion layer should include these five influence factors. Assume that this time it compares three micro-cultures ways P_i, and then scheme layer includes three schemes. Constructed hierarchical structure is as Figure 2.
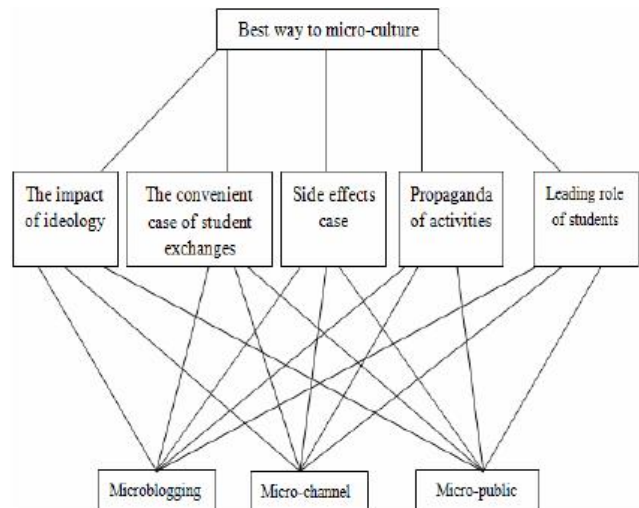

Figure 2 : The hierarchy chart of Best way to micro-culture

Judgment matrix construction

For judgment matrix construction, firstly it should define university students' political education five influence factors importance. TABLE 3 is questionnaire survey result on university students and teachers. From

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TABLE 3, it is clear that the impact to ideology, the convenient case of student exchanges, side effects impact, and propaganda of activities and leading role of

TABLE 4 : Target layer paired comparison matrix

A	B_1	B_2	B_3	B_4	B_5
B_1	1	3	4	7	8
B_2	1/3	1	2	5	7
B_3	1/4	1/2	1	4	6
B_4	1/7	1/2	1/4	1	3
B_5	1/8	1/7	1/6	1/3	1

TABLE 5 : Criterion layer paired matrix one

B_1	P_1	P_2	P_3
P_1	1	3	1/5
P_2	1/3	1	1/7
P_3	5	7	1

TABLE 6 : Criterion layer paired matrix two

B_2	P_1	P_2	P_3
P_1	1	1/3	3
P_2	3	1	5
P_3	1/3	1/5	1

TABLE 7 : Criterion layer paired matrix three

B_3	P_1	P_2	P_3
P_1	1	3	1/5
P_2	1/3	1	1/4
P_3	5	4	1

TABLE 8 : Criterion layer paired matrix four

B_4	P_1	P_2	P_3
P_1	1	1/2	3
P_2	2	1	5
P_3	1/3	1/5	1

TABLE 9 : Criterion layer paired matrix five

B_5	P_1	P_2	P_3
P_1	1	2	1/3
P_2	1/2	1	1/5
P_3	3	5	1

students these five factor to university students ideological and political education impacts.
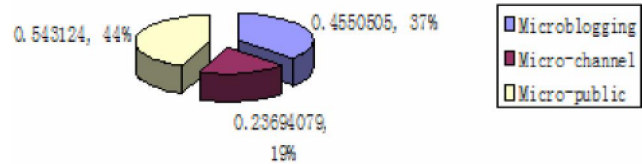

Figure 3 : The figure of evaluation results

TABLE 10 : Hierarchical total arrangement

Criterion		Leading role of students	The impact to ideology	Propaganda of activities	The convenient case of student exchanges	Side effects impact	Total arrangement weight
Criterion weight		**0.4848**	**0.2437**	**0.1645**	**0.0740**	**0.0329**	
Scheme layer single arrangement	Micro blogging	0.1884	0.2583	0.2111	0.2790	0.3090	0.455051
	Micro-channel	0.0810	0.6370	0.1093	0.0719	0.5816	0.236941
	Micro public good	0.7306	0.1047	0.6795	0.6491	0.1095	0.543124

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Thereupon, we establish target layer paired comparison matrix, as TABLE 4 show.

Then, establish criterion layer paired matrix, contents are as TABLE 5-9.

Computed result

Stated computing process can use *Matlab* software program to calculate, computed result is as TABLE 7.

In order to intuitional express micro blogging, micro-channel and micro public good impact status on university students' ideological and political education activities, draw TABLE 7 total weights data into pie chart, as Figure 3.

By Figure 3, we can find that micro public good has deepest impacts on university students' ideological and political education. Therefore, in future education process, micro public good is worthy recommending.

CONCLUSION

By far, analytic hierarchy process has features as simplicity, accuracy and flexibility. Therefore, its application in each field is very widely. Such as, enterprise financial risk evaluations, coal mine safety production indicators defining, bank information system security evaluation and so on. Due to the method needs to judge paired factors importance ratio, when ratios judgment are incorrect, obtained results are also incorrect.

The paper utilizes analytic hierarchy process into research on university students' ideological and political education impacts, and makes comparison of micro-cultures three ways from five aspects they are impact on ideology, the convenient case of student exchanges, side-effect influences, propaganda of activities and leading role of students, we find that micro public good has the deepest impact on university students' ideological and political education.

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