

# On the Mechanical Graphic Expression of the Acting Force of Ideological and Political Education's Influencing Factors

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**Abstract:** The effect of ideological and political education is decided by both macro environment and micro environment, while the two elements have their own influencing factors. The existed analysis on the effect of various factors of on the ideological and political education itself is still abstract and theoretical, having not being graphic. This paper mainly focuses on how to realize the visualization and graph of various factors on the Ideological and Political Education. The knowledge used in this paper is mainly the parallelogram rule in physics. Reasonably and effectively combining the parallelogram rule in physics and the theory of ideological and political education's influencing factors, it graphically analyzes the impact of various factors on ideological and political education.

**Keywords:** ideological and political education; parallelogram rule; factors; joint force; effect

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## 1. Influencing Factors of Ideological and Political Education

Influencing factors of ideological and political education include the macro environment and micro environment.

### 1.1. Macro Environment

The macro environment of ideological and political education includes economic environment, political environment, cultural environment and the mass media environment. Economic Environment: social and economic system, and economic living condition. Social and economic system is the sum of the production relation including ownership of the means of production; the status and their relationships of different social groups in production as well as the distribution of production determined by the above 2 aspects are generated. Political environment: the social and political system and the real political situation. Social and political system is the core

of the superstructure built on the basis of certain social economics, the material means embodying the thinking relationship of people, and also a concentrated expression of class interests.

The core of political system is the status of social classes in our country, that is who should be the master. Thus the political system has the essential influence and constraint on ideological and political education and it decides the adscription of leadership of ideological and political education. Cultural Environment: generally speaking, culture can be distinguished from the perspective of broad and narrow sense. The broad culture means the sum of material wealth and spiritual wealth created by human, while the narrow culture especially refers to social ideology and its corresponding system as well as organization. Media environment: the influence of the mass media on people's ideological and political education mainly includes 2 aspects: (1)Forms of mass media are closely linked with people's lives, such as, newspapers, periodicals, radio, television and networks. (2) Information disseminated by mass media will generate a public opinion environment.

### 1.2. Micro Environment

The micro-environment of the influence factors of ideological and political education includes family environment, school environment, social organization (work) environment, community environment and peer group environment. Family environment means family environment of the ideological and political education, mainly referring to the influence of ideological quality and behavioral norms of parents on the formation of moral character of family members especially their children. School environment: the impact of school environ-



ment on the moral character of students, which is mainly achieved through teaching activities, extracurricular activities, teacher role models, school spirit and other aspects. Social organization (work) environment: it includes (1) benefits of social organization; (2) atmosphere of social organization; (3) the image of organization leadership. Social environment: it includes (1) life order of the community and development degree of economic; (2) social atmosphere; (3) ethics; (4) interpersonal communication. Peer group environment: the so-called peer group is defined as the groups with close relationship formed by people with similar family background, age, hobbies, characteristics and etc.

## 2. The Mechanical Expression of Reasonable Function of the Ideological and Political Education's Influence Factors

The effect of influence factors on ideological and Political Education is always qualitative and abstract rather than figurative, concrete and quantitative. If we apply the "parallelogram theory" of the mechanical theory in physics to the effect of ideological and political influence factors, the visualization, reification and quantification on ideological and political education can be achieved.

### 2.1. Overview of the Theory of Physical Mechanics

According to the quantitative analysis on the effect of ideological and political education, the parallelogram rule, cosine theorem and sine theorem can be applied.

#### 1) Parallelogram rule

When the two forces are composed to generate a parallelogram with the directed line segments of the 2 forces as the adjacent sides, then the diagonal between the adjacent sides stands for the size and orientation of the composition of forces. This is called parallelogram rule.

When the vectorial resultant occurs, we can generate a parallelogram with the directed line segments of the 2 vectors as the adjacent sides, thus the diagonal between the adjacent sides stands for the size and orientation of the vectors. This is called parallelogram rule of vectors. The head of the resultant vector is corresponding to the head of sub-vector, while the end of the resultant vector is corresponding to the head of another sub-vector. As shown in Figure 1.

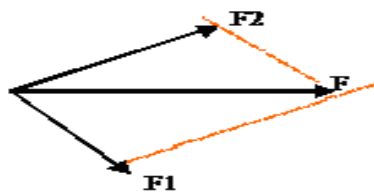


Figure 1. The included angle between F1 and F2 is b, while the included angle between the joint force F and F1 is a

$$F = \sqrt{F_1^2 + F_2^2 + 2F_1F_2\cos a}$$

$$\tan b = \frac{F_2 \sin a}{F_1 + F_2 \cos a}$$

#### 2) Cosine theorem

$$F = \sqrt{F_1^2 + F_2^2 + 2F_1F_2\cos a}$$

#### 3) Sine theorem

$$\frac{F_1}{\sin a} = \frac{F_2}{\sin b} = \frac{F_3}{\sin c}$$

## 2.2. The Joint Force of Both Macroeconomic Factors and Micro Factors on the Ideological and Political Education

Assume F as the effect of Ideological and Political Education, F1 as the effect of macro-factors on the ideological and political education, F2 as the influence of micro-factors on the ideological and political education, as shown in Figure 2.

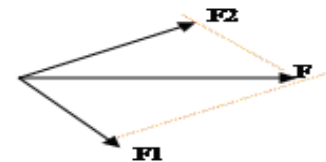


Figure 2. The joint force of both macroeconomic factors and micro factors on the ideological and political education

F2: The effect of micro factors on ideological and political education

F: The effect ideological and political education

F1: The effect of macro factors on ideological and political education

Solve the acting force of F by the calculation formula of cosine theorem, that is, the effect of ideological and political education.

$$F = \sqrt{F_1^2 + F_2^2 + 2F_1F_2\cos a}$$

## 2.3. The Joint Force of All Factors in Macro and Micro Factors on the Ideological and Political Education

For the combined effect of multiple factors, analyze any combination of two-factor separately first and then analyze the combined action. Suppose F = effect of ideological and political education, F1 = the effect of macro environment, F2 = effect of micro environment, at the macro environment: F3 = effect of the economic environment, F4 = effect of the political environment, F5 = effect of cultural environment, F6 = effect of the mass media; in the micro environment: F7 = effect of family environment, F8 = effect of school environment, F9 = the



effect of society organizations (work) environment, F10 = The effect of community environment, F11 = effect of peer group environment.

Note: angle here is the intersection angle of any two forces, which have different values a.

1) *The combined effect of all macro factors on macro factors of ideological and political education*

By the force analysis of both economic and political environment impacts, and the force analysis of impacts of cultural environment and mass media, finally calculate the impacts of these two forces on the macro environment.

The joint force analysis on the effect of economic and political environment, as shown in Figure 3.

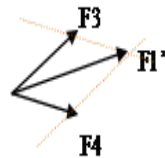


Figure 3. The joint analysis on economic and political environment

F3: The impact of economic environment on the macro-environment of ideological and political education

F1': The joint effect of economic and political environment

F4: The impact of political environment on the macro-environment of ideological and political education

$$F_1' = \sqrt{F_3^2 + F_4^2 + 2F_3F_4\cos\alpha}$$

The joint force analysis on the effect of cultural environment and mass media, as shown in Figure 4.

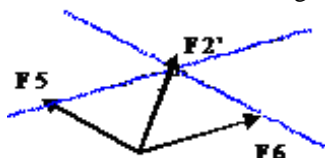


Figure 4. The joint effect of cultural environment and mass media

F2': The impact of cultural environment on the macro-environment of ideological and political education

F5: The impact of mass media on the macro-environment of ideological and political education

F6: The reasonable analysis on the effect of cultural environment and mass media

$$F_2' = \sqrt{F_5^2 + F_6^2 + 2F_5F_6\cos\alpha}$$

Acting force F1 of macro-environment is the joint force of F1' and F2', as shown in Figure 5.

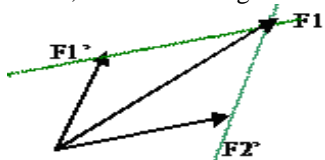


Figure 5. The acting force of macro environment

F1: The impact of macro environment on the ideological and political education

$$F_1 = \sqrt{F_1'^2 + F_2'^2 + 2F_1'F_2'\cos\alpha}$$

2) *The joint impact of the various factors in micro-factors on the micro-factors of ideological and political education.*

Apply the joint force analysis on family environment and school environment, social organization and community environment, then use the above 2 joint forces to solve the joint force, and then conduct joint analysis on the above joint and the group environment, the obtained joint force is the influence of micro-environment.

The joint force of family environment and school environment, as shown in Figure 6.



Figure 6. The joint force of family environment and school environment

F7: The impact of family environment on the micro environment of ideological and political education

F8: The impact of school environment on the micro environment of ideological and political education

F3': The joint force of family environment and school environment

$$F_3' = \sqrt{F_7^2 + F_8^2 + 2F_7F_8\cos\alpha}$$

The joint force of social organism and social organization and community environment, as shown in Figure 7.

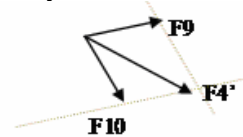


Figure 7. The joint force of social organization and community environment

F9: The impact of social organization on ideological and political education

F4': The joint force of social organization and community environment

F10: The impact of community environment on the macro environment of ideological and political education

$$F_4' = \sqrt{F_9^2 + F_{10}^2 + 2F_9F_{10}\cos\alpha}$$

The joint forces of 4 micro factors, as shown in Figure 8.

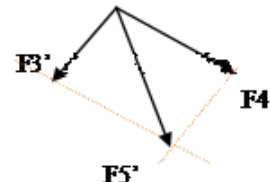


Figure 8. The joint forces of 4 micro factors



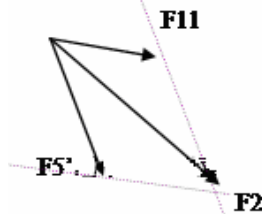
F3': The joint forces of family environment and school environment

F4': The joint forces of social organization and community environment

F5': The joint forces of 4 micro factors

$$F_5' = \sqrt{F_3'^2 + F_4'^2 + 2F_3'F_4'\cos a}$$

The impact of macro-factors on ideological and political education, as shown in figure 9.



**Figure 9. The impact of micro factors on ideological and political education**

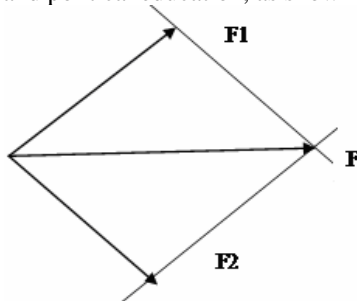
F11: The impact of peer group environment on micro environment

F5': The joint forces of 4 micro factors

F2: The impact of micro factors on ideological and political education

$$F_2 = \sqrt{F_5'^2 + F_{11}^2 + 2F_5'F_{11}\cos a}$$

The impact of macro factors and micro factors on ideological and political education, as shown in Figure 10.



**Figure 10. The effect of ideological and political education**

F1: The impact of macro environment on ideological and political education

F: The effect of ideological and political education

F2: The impact of micro environment on ideological and political education

$$F = \sqrt{F_1^2 + F_2^2 + 2F_1F_2\cos a}$$

In accordance with the above parallelogram rule, no matter the number of small factors in macro and micro factors is increasing or decreasing, the parallelogram rule all can be applied.

### 3. Graphical Analysis

Graphical analysis includes the analysis on the angle and the size of F, where F refers to the effect of ideologi-

cal and political education. Assume the right of F to the positive direction, while the left of F as the negative direction. Assume angle a as the angle between the two factors, while angle b as the included angle of ideological and political education's effect F and the direction of horizontal right

#### 3.1. Numerical Analysis of the Angle a

When the angle  $00 < a < 900$ , the two factors are co-acted.

When the angle  $a = 900$ , the two factors are co-acted, but have reached saturation;

When the angle  $900 < a < 1800$ , the effect of two factors are offset.

#### 3.2. Numerical Analysis of the Angle b

When the angle  $00 < b < 900$ , the effect of ideological and political education plays an active role;

When the angle  $b = 900$ , the effect of ideological and political education reaches saturation;

When the angle  $900 < b < 1800$ , the effect of ideological and political education plays an constrained role;

#### 3.3. Analysis on the Size of F

When  $F > 0$ , the effect of ideological and political education plays an active role;

When  $F = 0$ , the effect of ideological and political education reaches saturation;

When  $F < 0$ , the ideological and political education plays an constrained role.

### Conclusions

In accordance with the above parallelogram rule, no matter the number of small factors in macro and micro factors is increasing or decreasing, the parallelogram rule all can be applied.

### References

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