



# Research Method Innovation of College Students' Ideological and Political Education Based on Cognitive Neuroscience

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## ABSTRACT

The innovation of college students' ideological and political education needs to combine the current situation of education development, follow relevant principles and rules and adjust the principles and mechanisms of education in a timely manner, then make them develop towards a healthy direction. Only through a variety of methods to make the content of ideological and political education into individuals' mind, can the ideological and political education achieve substantial results. Recently, the systematization and diversification of the research methods of ideological and political education cannot satisfy the requirements of the scientific development of the its research. This paper actively draw on the ideas and methods of natural science and social science research field, the innovation of cognitive neuroscience is applied to college students' ideological and political education research methods, supplied advanced technology and broader research perspective from the aspect of tool provides for the study of the ideological and political education. Accurate and scientific data of the effect of ideological and political education can be obtained through measuring the physiological changes in the specific areas of the human brain by electroencephalography. According to the results of the experiment, we designed more effective education and teaching activities, cleared the educational intervention plan, optimized the plasticity of the brain, and enhanced the effectiveness of ideological and political education.

296

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## Introduction

As a valuable talent resource for national construction, college students play an important role in the development and progress of the nation, and are the hope of the future of the country. As qualified successors, college students not only need to have a better scientific literacy, but also have a higher ideological and political quality. At present, it's an important measure to strengthen the ideological and political education of college students for cultivating qualified builders and successors of socialist cause. Therefore, according to the new situation and task in terms of college students' ideological and political education, it is of

great significance to explore new suitable ways for raising the actual effect of ideological and political education. Scientization has become the main trend of the development of ideological and political education in recent years, and is also the basic thought of further strengthening and improving ideological and political education under the new situation.

The scientific nature of the development of ideological and political education firstly embodies the methodology stand of research and the scientific nature of concrete research methods, which directly influences the

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**Table 1.** The comparison of cognitive neuroscience with cognitive science and Neuroscience

	Cognitive science	Neurosciences	Cognitive neuroscience
Research Target	Nature and law of human cognition and intelligence	Structure and function of human and animal nervous system	Brain mechanism of cognitive activity
Feature	Interdisciplinary, behavioral level	Interdisciplinary, multi-level	Interdisciplinary, multi-level

theoretical and practical development of the ideological and political education. The development of cognitive neuroscience and the application of related techniques (Wang *et al.*, 2011; Du *et al.*, 2017; Song *et al.*, 2016) not only brings new opportunities for the development of the research field of ideological and political education and the innovation of methods, but also provides a new way for the research of ideological and political education to improve its scientific level

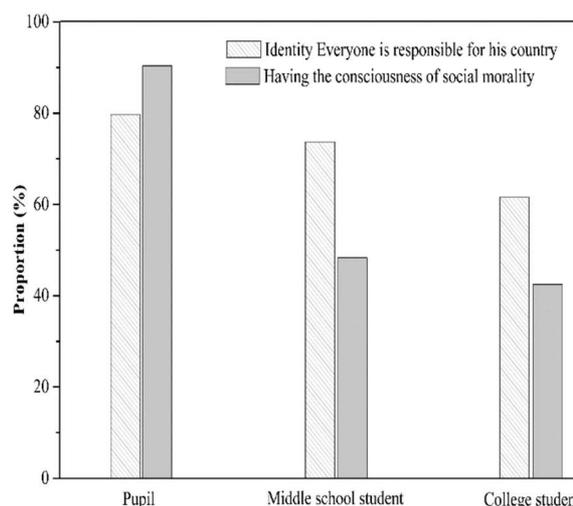
In recent years, cognitive neuroscience is a new discipline, its relationship with cognitive science and neuroscience is shown in Table 1. As a cross discipline of cognitive science and neuroscience, cognitive neuroscience (Liu and Sang, 2007) has presented a rapid development trend in recent years, which makes the last decade of the 20th century also known as "brain decade" (Wen *et al.*, 2013; Sun *et al.*, 2017). The cognitive neuroscience aims to clarify the brain mechanism of human psychological activity in order to reveal the relationship between mind and brain, and its purpose is to clarify the brain mechanism of cognitive activity.

Because the study of ideological and political education involves people's thought, which is a highly complex existence (Wang *et al.*, 2013), although in the process of education, it's possible to cultivate the brain activities of the educated through purposeful influence and exercises, effectively enhance the scientificity and effectiveness of ideological and political education, and realize the purpose of ideological and political education (Zhang *et al.*, 2013; Du *et al.*, 2018), in the study of realistic ideological and political education, the researchers actually exist outside the consciousness of the cognitive subjects, so that it is impossible to accurately explore the internal mechanism of the individual's behavior in the cognitive process. The research of cognitive neuroscience provides advanced technical means and broad field of vision for the research of ideological and political education from the tool level.

### The task and problem of ideological and political education for College Students

#### Task of ideological and political education for College Students

Nowadays, the growth and development of the new generation is of great significance to the rise of the Chinese nation. Figure 1 shows the results of a survey of 1,009 students by Guangzhou Modern Science and Education Center. According to the information in the figure, with the increase of students' education level, students' recognition of Chinese traditional moral concept is actually decreasing. In order to improve students' ideological consciousness, it is imperative to carry out ideological and political education by scientific methods. For an in-depth discussion, the tasks of college students' ideological education mainly include the following aspects:



**Figure 1.** Survey and statistics of 1009 students in Guangzhou modern science education center

(1) Guiding college students to establish correct world outlook, and outlook on life and values

Only when college students are educated and guided to establish firm ideals and beliefs, can the correct world outlook, and outlook on life and values be established. The most basic thing to form good ideological and political quality is to set up correct world outlook, and outlook on life and values with ideal and belief education as the core, mainly solving the problems such as correct understanding of the Party's banner, the country's path and their own social responsibility, and consolidating the ideological and political quality of college students (Zhao, 2007).



(2) Enhancing the national consciousness of college students

Secondly, it can be seen from the investigation results in the figure that the national consciousness of college students is generally weak, while our moral education is mainly aimed at carrying forward and cultivating the national spirit education in depth, and helping college students form the mental state of combining the national spirit and the time spirit.

(3) Improving the comprehensive quality of college students

Finally, it's necessary to improve the comprehensive quality of college students, so that college students can achieve harmonious growth between morality and talent. Promoting the all-round development of college students is of great significance to promoting the all-round development of people and improving the quality of the whole nation. The overall development of college students is not only the enrichment of knowledge and the improvement of skills, but also the overall development of ideological and moral qualities, scientific and cultural qualities and healthy qualities.

**Problems in the research methods of ideological and political education for college students**

Along with the continuous improvement of China's economic level, people's investment in education is also increasing, and the ideological education of college students in China has been improved. Because the ideological and political education mainly lies in the spiritual level, the cultural level and the value level play the guiding role, and it is difficult to obtain a standard scale. In the new era, the ideological and political education of college students is facing a lot of difficulties. The society has put forward a severe test for the ideological education of college students in all colleges and universities.

(1) Lower effectiveness of ideological and political education

At present, there are many problems in the study of ideological and political education, such as the method singleness, lack of systematization and diversification, which cannot adapt to the scientific development of ideological and political education. On the whole, the study of ideological and political education is now confined to experience, without means to accurately measure or reflect the effect and influence in the process of education.

(2) Lack of empirical research on ideological and political education

As far as the current popular empirical research is concerned, it is not only small in quantity but also mostly based on questionnaire. In the process of research, generally scholars prefer to adopt a relatively single research method, especially for such kind of research on the spiritual level. In the process of questionnaire investigation, there are also many subjective or objective problems that cannot be ignored. As shown in Figure 2, there is a deviation between the results of rational thinking and the subconscious cognition, and the final results are also the results of rational thinking, rather than the direct response of the brain, when the questionnaire is filled in for each sample. The results of the questionnaire are equivalent to the rational choice of the individual, and no one knows the subconscious choice of the individuals.

(3) Lack of imperceptible environment in ideological and political education

At present, the ideological and political education in colleges and universities is mainly presented in the form of classroom. As a subject, it has certain examination system and compulsory nature. On the one hand, as a textbook knowledge, it has limited influence on individual behavior norms, and on the other hand, it is easy to cause the inversion of the educated. In colleges and universities, there isn't a means to carry out imperceptible ideological and political education for students.

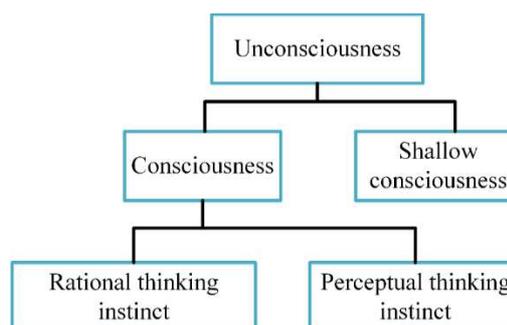
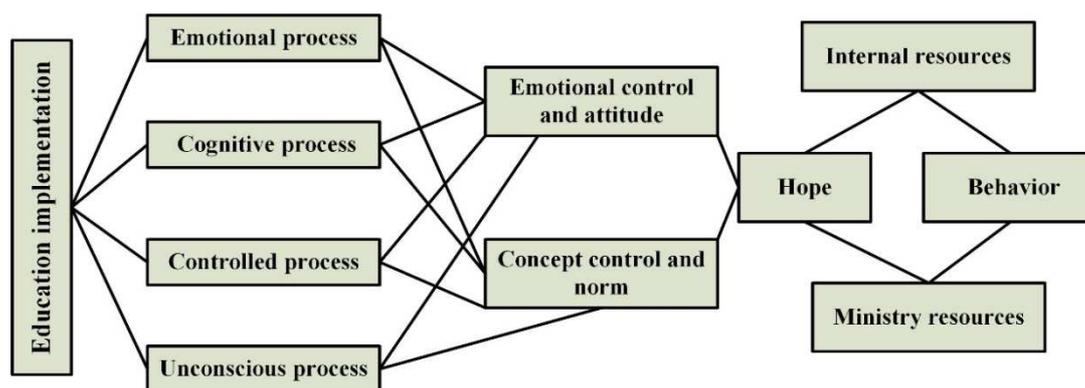


Figure 2. The mind and consciousness of the human

**The application of cognitive neuroscience in the research methods of ideological and political education**

*Cognitive neuroscience and human behavior*

The brain is the main commander of the human body, and only by understanding the relationship between brain and human behavior can we find better ways to regulate human behavior. The



**Figure 3.** Cognitive neurology and education

**Table 2.** The relationship between brain and cognition

Function	Left brain (Rational thinking and language)	Right Brain (Image, space and music)
Vision	Gratitude, word recognition	Complex graphics and face recognition
Hearing	spoken language	Environmental sound and music
Motion	Complex random motion	Spatial organization of motion pattern
Language	Listening, speaking, reading and writing	R.W.Sperry(1981)
Spatial mathematical ability	Mathematical ability	Geometry, sense of direction and mental rotation

research of cognitive neuroscience is to elucidate the brain mechanism of cognitive activity, that's, how the human brain invokes its components at various levels, including molecules, cells, brain tissue areas and the whole brain, to realize various cognitive activities. Cognitive neuroscience uses the methods of natural science to elucidate the relationship between the brain and human behavior when it programs with neurons.

In the course of the study, we compare the specific cognitive ability with the physiological information to see the differences and connections, and then look for the physiological basis and mechanism corresponding to the specific cognitive function, as shown in Table 2. As the core of nervous system, the brain is the focus of cognitive neuroscience. Rather than paying attention to behavior in general psychology, cognitive neuroscience uses more objective brain imaging techniques as a basis for research. Cognitive neuroscience is a bridge between matter and spirit, which makes us better use of data science to quantify brain consciousness and more accurately correspond to human behavior.

**Coupling of education and cognitive neuroscience**

Educational research is concerned with the development of the nation, so educators and psychologists have made every effort to find

positive and effective educational programs since the 1920s, but it has been difficult to find scientific and rational theoretical basis. With its unique and advanced theoretical knowledge and analytical means, the cognitive nervous system gradually enters people's field of vision and deeply analyzes human's ideological activities and behaviors in a scientific way. Along with the development of various scientific monitoring means, they have promoted the optimization of educational means. In particular, the measure method of brain imaging technique, the method of electrical brain stimulation (EBS) and the method of transcranial magnetic stimulation (TMS) can more effectively and accurately monitor human cognition, which is of great significance to promote human understanding of themselves, and scientifically and effectively utilize theoretical knowledge to educate students.

**Research on the methods of cognitive neuroscience to promote ideological and political education**

Neuroscience thinks that people's behavior is the result of the mutual influence and interaction of human nervous systems. In the course of ideological and political education in schools, the education of students includes two parts: the inculcation of knowledge and the standardization of behavior. Our aim at educating our students is not just to have a written understanding of



morality and thought, but to try to regulate their behavior in the course of their daily activities.

From the detailed analysis as shown in Figure 3, people form the self-recognition of behavior codes and control their own behavior and emotion through receiving education. What we need to pay attention to is that the standardization of human behavior not only occurs in the process of education, but also has a great relationship with the external environment.

(1) Focusing on the controlled process of educational objects

The controlled process refers to the active thinking process of the controlled subjects to new problems. In the process of education, teachers should respect the personality and dignity of college students, and create an equal environment of dialogue and communication, so as to stimulate and arouse the intrinsic motivation and enthusiasm of students. In the process of students growing up together with teachers, accepting knowledge and sharing harvest, let students think about self-worth, actively control their behavior, and finally develop to be active and conscious self-improvement.

In the process of self-improvement, we should pay attention to the guidance of college students' emotional control and psychological goals. Due to the control of different parts of the brain, rules of emotional and rational activities and modes of action are very different. Since emotional reactions do not depend on the cerebral cortex, they are more rapid and direct than rational reactions. From the perspective of cognitive neuroscience, emotion influences students' preference, and further indirectly affects students' cognition of things, and controls students' way of thinking when they encounter problems, so as to fundamentally change students' rationality and understanding in daily life and make their cognition itself deviate from rationality.

(2) Actively creating the environment to realize the process of emotional control

As emotional workers, ideological and political educators must make efforts to plan and control, and show emotional activities according to the requirements of the organization. The activity of emotion has certain behavior norm, and in this process, the educators must follow the emotion expression rule. If the same emotion can be expressed publicly under certain conditions, it should not be expressed publicly under certain environmental conditions.

In the process of ideological and political education, educators and students need to communicate equally and create an environment of mutual understanding. Through face-to-face language communication, educators express appropriate emotions and convey attractive and moving educational content in an effective educational way to encourage students to think positively and develop their potential of active learning.

(3) Paying attention to the role of unconscious processes

Neuroscience has found that the unconscious processes of the brain tends to deal with problems in the closest pattern when it comes to solving problems, because people don't feel spending too much energy and time at this time. In the process of ideological and political education, we should pay more attention to how to carry out the unconscious process education in order to improve the cognitive level of college students and the rebellious psychology brought by changing traditional educational methods.

The experiment of psychology proves when adopting persuasion education, if it is too obvious, it will arouse resistance and rebellious psychology to this kind of foreign information, so it will bring better effect if the unconscious education can be used in the process of education. In the ideological and political education, teachers, according to the predetermined educational content and plan, consciously set up a certain living environment and cultural atmosphere around the educated, who are not aware of, to guide the educated to feel and experience, so that they can receive the education silently while satisfying the psychological needs and interests. In the course of unconscious education, the equality of status between the educators and the educated alleviates the psychological depression of the students, thus enhancing the consciousness of active participation.

(4) Optimizing the overall environmental atmosphere of education

The environment in which people live will influence the unconscious process of the brain and the special function modules. A good social atmosphere can enhance the effectiveness and educational resultant force of ideological and political education, and the non-performing environment will weaken the power of ideological and political education. Therefore, it is necessary to create a good overall atmosphere. As far as the

school is concerned, it is necessary for educators to teach and create a good atmosphere, and the education of college students is not only the task of the school, but also the participation of the whole society to create a good environment for the normal growth of students.

### **Expectation the significance of neuroscience to ideological and political education**

#### *Collaboration between psychologists and front-line educators*

As the main research object of the educational process, students need to participate in and test the actual effects of all kinds of educational means, and psychologists undoubtedly lack this kind of support. With the development of the research process, if the psychologists can cooperate with the front-line educators and collect the feedback of students' behavior as the experimental basis while adjusting the educational program, it is not only beneficial for the educators' means optimization, but also provides the practical data support for the psychologists' theoretical assumption in the scientific research process.

#### *Combination of educational researchers and biological science*

The cognitive process of the brain has strong theoretical support, but its actual test results are not very sufficient, and in the actual research process, it can be combined with biology for further research.

For example, the hormones of human body or small molecules can be analyzed and controlled to study the influence of their existence on the study, and further study the appropriate amount of the hormones of human body or small molecules under the stimulation of what environment. For example, dopamine has a great influence on the cognition of the human body. In theory, when students experience the reward of dopamine system to their correct prediction - happy emotion in class, they can also stimulate their intrinsic motivation, continue to overcome the challenges, and strive to reach a deeper level of learning. But this conjecture lacks the actual experimental result to carry on the authentication.

#### *Making full use of scientific testing means*

To make full use of the development of today's science, we use brain imaging technique, electrical brain stimulation (EBS) and the method of

transcranial magnetic stimulation (TMS) to monitor human cognition and obtain great practical support, so that the educational process is more scientific and effective (Lin and Zhang, 2017).

### **Conclusions**

Through the analysis of this article we can find out that there is still a lot of problems in the process of ideological and political education, especially among the college students. In order to solve the problems about timelines and effectiveness. First, teachers should concern more about the controlled process of students and try to get a good feedback; Second, actively create the environment for the realization of the emotional controlled process, in order to stimulate the students to think actively and develop the potential of active learning by means of effective educational methods, the attractive and infectious education content is conveyed. Third, pays attention to the role of the unconscious process, which means in the ideological and political education, teachers' education in accordance with the contents and scheme of the reservation, educate in the case of no aware, and guide the student to feel and experience, then enable them to meet the psychological needs and interests at the same time, accept education imperceptibly. Undoubtedly, cognitive neurology can guide ideological and political education. In order to better realize the theory guiding practice, we should making full use of the development of science today, using brain imaging technology measurement, EBS and TMS to monitor human cognition and get great practical support, making the educational process more scientific and effective.

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### **References**

- Du XL, Shi Z, Peng ZC, Zhao CX, Zhang YM, Wang Z, Li XB, Liu GW, Li XW. Acetoacetate induces hepatocytes apoptosis by the ROS-mediated MAPKs pathway in Ketotic cows. *Journal of Cellular Physiology* 2017; 232(12): 3296-3308.
- Du X, Zhu Y, Peng Z, Cui Y, Zhang Q, Shi Z, Guan Y, Sha X, Shen T, Yang Y, Li X, Wang Z, Li X, Liu G. High concentrations of fatty acids and beta-hydroxybutyrate impair the growth hormone-mediated hepatic JAK2-STAT5 pathway in



- clinically ketotic cows. *Journal of Dairy Science* 2018; 0302 (18): 30029-38.
- Liang C, Wei W, Zhao J. The Progress of Emotional Brain Mechanism in the Social Cognitive Neuroscience. *Process in Modern Biomedicine* 2007; 7(7): 1096-98.
- Lin YQ, Zhang DD. The Effect of Hyperscanning Technique in Social Cognitive Neuroscience. *Chinese Journal of Applied Psychology* 2017; 23(4): 300-08.
- Liu JS, Sang B. A Review of Developmental Cognitive Neuroscience. *Psychological Science* 2007; 30(1): 123-27.
- Song Y, Li N, Gu J, Fu S, Peng Z, Zhao C, Zhang Y, Li X, Wang Z, Li X, Liu G.  $\beta$ -Hydroxybutyrate induces bovine hepatocyte apoptosis via an ROS-p38 signaling pathway. *Journal of Dairy Science* 2016; 99(11): 9184-98.
- Sun XD, Yuan X, Chen L, Wang TT, Wang Z, Sun GQ, Li XB, Li XW, Liu GW. Histamine Induces Bovine Rumen Epithelial Cell Inflammatory Response via NF- $\kappa$ B Pathway. *Cellular Physiology and Biochemistry* 2017; 42(3): 1109-19. [4]
- Wang J, Guo C, Li HL. Building Relationship between Educational Psychology and Cognitive Neuroscience. *Shanghai Research Education* 2009; 11: 30-33.
- Wang XD, Zhang LC, Xiao XY. Exploration of the Potential of Brain in Learning: Research on Cognitive Neuroscience. *Open Education Research* 2011; 17(5): 40-51.
- Wen D, Wang YQ, Wu XY. The Cognitive Theory of Multimedia Learning: An Innovative Study based on Perspectives of Cognitive Neuroscience. *Modern Distance Education Research* 2013; 3: 40-49.
- Zhang DX, Jia ML, Deng YC. The Implications of Moral Cognitive Neuroscience for Moral Education. *Journal of Hangzhou Teachers College (Social Sciences Edition)* 2011; 33(2): 119-23.
- Zhao J. The Approach and Advances in Researching on Social Cognitive Neuroscience. *Process in Modern Biomedicine* 2007; 7(8): 1233-35.