

# Research and Practice of Ideological and Political Education Reform of "Computer Organization Principle"

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**Abstract:** The ideological and political course has important theoretical value and practical significance in education and teaching. Starting from the course of computer composition principle, this paper expounds the necessity of carrying out ideological and political education in the course of computer composition principle. In the implementation of Ideological and political teaching, it combines the characteristics of the course and integrates cases related to professional content to carry out teaching, such as the new generation processor Loongson 3a4000/3b4000. In addition, students' entrepreneurial thinking and team consciousness are cultivated through scientific and technological innovation activities competition, and students' sense of mission and national centripetal cohesion are cultivated by conquering National Science and technology major projects such as high-end general chips. On the exploration of Ideological and political teaching methods, information technology is combined. It integrates micro class, MOOC and other teaching forms to carry out diversified ideological and political education penetration through classroom introduction, teacher-student interaction, student summary, innovation and entrepreneurship projects; in terms of assessment and evaluation, it examines the achievements of Ideological and political education from the aspects of subject performance, homework and innovation and entrepreneurship participation. Finally, some suggestions are given to improve the current ideological and political teaching of computer composition principle.

**Keywords:** Ideological and Political Education, Teaching Reform, Principles of Computer Composition

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## 1. Introduction

As the ancients said, "Respecting teaching and persuading learning is the foundation of the founding of a country; the promotion and cultivation of talents is the first task of politics." Education is an important cornerstone of national rejuvenation and social progress. It is also a project of moral government which is of great significance in improving the comprehensive quality of the people, promoting the all-round development of people, enhancing the innovation and creativity of the Chinese nation, and realizing the great rejuvenation of the Chinese nation. General secretary Xi Jinping emphasized at the National Conference on Ideological and political work in Colleges and universities that we should persist in taking the moral education as the central link and integrate the ideological and political work throughout the whole process of education and teaching, so as to achieve in the whole process of educating people and educating people in an all-round way [1]. Since the reform and

opening up, the Party Central Committee has issued more than 10 documents on Ideological and political work in schools, which put forward clear requirements for the construction of Ideological and political courses, and constantly promote the reform of Ideological and political courses. We should clearly realize that to improve the effectiveness of Ideological and political education in Colleges and universities, we must give full play to the role of classroom education as the main channel. According to the basic requirements of "running a socialist university with Chinese characteristics, we should adhere to moral education, integrate the cultivation and practice of socialist core values into the whole process of teaching and educating people", and transform the subject resources and academic resources into educational resources "Knowledge teaching" and "value guidance" should be organically unified to promote the three-dimensional transformation of "Ideological and Political Curriculum" to "curriculum ideological and political education" [2].

The organic combination of Ideological and political education and professional courses fully reflects the educational function of each course and the educational responsibility of every teacher. According to the characteristics of computer composition principle course, this paper analyzes the necessity of carrying out ideological and political education of computer composition principle, integrates ideological and political teaching content into classroom teaching, and preliminarily explores the teaching methods and assessment mechanism of Ideological and political education.

## **2. Necessity of Developing Ideological and Political Education of "Principles of Computer Organization"**

"Curriculum ideological and political" education and teaching reform focuses on the "pain points" existing in the curriculum system and teaching practice in Colleges and universities. It emphasizes that all teachers have educational responsibilities and all courses have educational functions. Different courses have their unique roles in talent training programs, and different majors and different courses also have their own laws and requirements of construction.

In order to carry out the teaching reform of "curriculum ideological and political education", first of all, we need to respect the law of curriculum construction. Secondly, we should not ignore the basic functions of the course, such as knowledge imparting, ability training and quality improvement. On this basis, we should explore and highlight the value leading role of the course in patriotism education, national pride, innovation and cooperation.

### **2.1. The Status and Nature of Curriculum Call for Ideological and Political Teaching**

"Computer composition principle" is a required course for software engineering and computer science and technology. Under the guidance of cultivating students' innovation ability and ability to solve practical problems, the course system is composed of theoretical courses, experimental courses, computer design and practice. Students can systematically understand the organization structure and working principle of computer hardware system, master the basic analysis and design method of computer hardware system, and establish the overall concept of computer system. On the basis of introduction to computer, digital circuit, assembly language and other courses, it describes the basic composition and working principle of the computer. Through relevant teaching activities, students can understand the structure, working principle, internal operation mechanism and design method of basic computer components (including arithmetic unit, controller, memory, input / output). To deepen the students' overall understanding of the computer software and hardware system, establish the concept of hardware / software coordination of the whole machine, and effectively enhance the students' computer system design ability. The course study

has laid a solid foundation for postgraduate examination, follow-up courses (such as system structure, parallel programming) and recruitment of IT enterprises.

As a compulsory course for students majoring in computer science, teachers are required to teach students to learn professional knowledge well, and pay more attention to ideological education, so that students can establish a correct outlook on life and values.

### **2.2. Teaching Objectives Require Ideological and Political Education**

The teaching objective of computer composition principle is to enable students to systematically understand the organization structure and working principle of computer hardware system, master the basic analysis and design method of computer hardware system, and establish the overall concept of computer system. For further study of computer design and practice and other follow-up courses; for the comprehensive training of students' computer system development and debugging ability, as well as design and innovation ability to lay a good foundation.

Ideological and political education focuses on the cultivation of Ideological and political quality. It teaches people to love their country, love their jobs, devote themselves to their work. It also involves the national policies and the future development vision. It is related to the growth and future development of everyone. This is the value of Ideological and political education [7].

"Curriculum ideological and political education" is a new attempt to establish morality and cultivate people. Teachers of engineering and technology courses not only need to teach professional skills in the professional field, but also need to embed team cooperation, patriotism and professional spirit of dedication in the process of teaching [8, 9]. Classroom is an important position of education and teaching. Ideological and political education is introduced into classroom teaching to encourage students to explore the thinking mode, values and cultural significance behind knowledge through specific knowledge and content [10-12]. Different disciplines have different characteristics and different curriculum ideological and political resources. To achieve the ideal effect of moral education, we need to constantly explore, practice and innovate in teaching content, teaching methods, organizational methods, evaluation mechanism and so on.

## **3. Integrating the Principles of Computer Organization with Ideological and Political Education**

### **3.1. Ideological and Political Integration into Teaching Content**

As far as the curriculum is concerned, "curriculum ideological and political education" is not forced to join the content of Ideological and political education, but combined with the characteristics of the professional curriculum itself to

effectively integrate the education content, making the professional course have feelings and taste [13, 14]. The ideological and political education of curriculum has fully exerted the effective educational value of all other courses, realized the organic integration of invisible education and explicit education, and embodied the creative transformation of Ideological and political education from full-time personnel to all teachers [15, 16]. Curriculum ideological and political education focuses on professional skills and knowledge as the carrier to carry out education. How to integrate the teaching content with ideological and political elements, combined with the characteristics of "computer composition principle" teaching content, try to carry out teaching from the national sense of honor and professional quality requirements.

### **3.1.1. Sense of National Honor**

In the course teaching of computer organization principle, we can introduce the current international advanced achievements independently developed by our country in combination with practical cases, so as to stimulate students' sense of national honor. In the classroom, teachers should spread positive energy with a positive attitude, impart correct moral values to students, and influence students' Outlook on life imperceptibly through actual cases.

On December 24, 2019, Loongson Zhongke Technology Co., Ltd. launched a new generation of processor Godson 3a4000 / 3b4000, realizing the leap forward development of independent CPU route. In January 2020, Huawei held a press conference at its headquarters in Shenzhen, and grandly released Huawei's latest arm server CPU, namely Kunpeng 920, which is the architecture used for mobile platform based on mobile tablet. This time, Huawei made use of its accumulated technical advantages on mobile platforms to develop the strongest processor representing arm architecture at one go. Huawei is going more and more smoothly on the road of self-developed chips. The press conference of the processor has renewed confidence in Huawei and China's chip R & D and manufacturing. On January 20, 2020, domestic xtracking flash memory architecture memory broke the international monopoly. In the 64 layer, the storage density of this generation has reached the world's best, and the product gap with the competitor's 96 layer is within 10%. After several generations of efforts, the gap with the international top technology level is getting smaller and smaller. All of these can arouse college students' pride in breaking through the blockade of foreign technology and embarking on the road of independent research and development, so as to stimulate students' learning enthusiasm and enhance their learning motivation.

### **3.1.2. Entrepreneurial Thinking and Team Awareness**

The significance of entrepreneurship education is to cultivate students' innovative consciousness and innovative thinking, improve their academic research ability and comprehensive quality, and meet the training requirements of skilled talents. To cultivate students' rigorous scientific attitude, strong team spirit and practical work style, effectively promote the construction of study style. Strengthen the practical course teaching, improve the students' application

ability of theoretical knowledge, stimulate students' motivation and interest in learning scientific and cultural knowledge independently, and achieve the effect of promoting teaching by competition through scientific and technological innovation activities.

In the teaching process, according to the teaching content, group discussion, through team cooperation to solve problems, make students unite with each other, cultivate the spirit of mutual help and friendly cooperation. The students in the class are divided into groups. According to a certain subject related to the content, the students make a team report by searching materials, researching and making relevant PPT, which stimulates students' interest in learning. Encourage undergraduates to discuss and put forward their own opinions, and take the discussion and interaction as one of the assessment contents.

### **3.1.3. Education of Sense of Mission and Responsibility of Discipline and Specialty**

In the course teaching design, according to the course content, the emphasis is placed on the future development direction of the country and the innovative technical achievements obtained at present, so as to increase students' interest in learning and strengthen their sense of identity and self-confidence in their major. In specific teaching cases, theory is combined with practice, and practical examples are used for analysis. For example, recently, the United States has finally let go of Intel, AMD, Sony, Samsung, TSMC, Howe technology and other six giants to resume supply to Huawei. The former Minister of the Ministry of industry and information technology issued a document saying that it should support Huawei to build a chip manufacturing line and reject the "neck sticking" of foreign technology. Bai Chunli, President of the Chinese Academy of Sciences, has announced that he will list lithography, key chips and other technologies that have been stuck in their necks as scientific research tasks and focus on breakthroughs. More importantly, the national policy is also good for domestic chip enterprises. China's chip and memory industry has been placed high hopes and received strong support from relevant national ministries and commissions. President Xi Jinping emphasized that "only by grasping the core technology in our own hands can we truly grasp the initiative of competition and development so as to fundamentally safeguard national economic security, national defense security and other security." At the national science and Technology Innovation Conference in 2016, overcoming high-end general-purpose chips was listed as one of the 16 major national science and technology projects.

Previously, high value-added chips, memory and other devices were mainly imported from abroad, including the case of Huawei ZTE leading enterprise suffering from technical blockade from the United States. Through the analysis of these examples, moral education will be integrated into teaching to enhance the persuasiveness and effectiveness of "curriculum ideological and political education", and strengthen students' sense of mission for professional learning and national centripetal cohesion.

### **3.2. Improving the Teaching Level and Explore the Teaching Method of "Ideological and Political Course"**

With the continuous reform of teaching ideas and means, classroom teaching mode in Colleges and universities is no longer a single teaching mode, especially the development of information technology. Ideological education is integrated into the teaching of professional courses through micro class, MOOC, mixed teaching and other forms.

#### **3.2.1. Network Teaching Platform**

Nowadays, the network and information have deeply affected people's work and life. Now college students also take their mobile phones with them in class at any time, and use the network teaching platform to put the contents of the class into the platform in advance, so that students can have a general understanding of the content of this class before class. When teachers give formal lectures, students can also keep up with the rhythm of the old teachers, and arouse the enthusiasm of students to learn.

#### **3.2.2. Way of Interaction Between Teachers and Students**

For example, when students add the instruction set to the instruction set of the course, they can understand what kind of instruction set they can learn through the research. In the process of the examination, the students' ability of scientific thinking has been strengthened. Stimulate the students' interest and potential.

#### **3.2.3. Attracting Students' Attention**

Teachers of engineering and technology courses not only need to teach professional skills in the professional field, but also need to embed team cooperation, patriotism and professional spirit of dedication in the process of teaching [4, 5]. Classroom is an important position of education and teaching. Ideological and political education is introduced into classroom teaching to encourage students to explore the thinking mode, values and cultural significance behind knowledge through specific knowledge and content [6-8]. Use the last five minutes of each class to talk with students about the latest news and hot issues in the industry. For example, the ranking of chip manufacturers and the development of memory industry can not only help students understand the situation of the industry, but also have some understanding of the application of professional knowledge, which is conducive to students' career planning. Make some small videos or download some small videos on the Internet to supplement the contents of the class, make full use of new media technology to imperceptibly influence the ideological and political education of students, and enhance the attraction of Ideological and political education.

#### **3.2.4. Extracurricular Group**

Aiming at the problems of professional introduction and hot issues, we organize interest groups, scientific research groups, debate groups and other ways after class to arrange professional teachers to guide corresponding groups after class, so as to improve students' learning ability in various

forms. The ideological and political education should be infiltrated according to local conditions to guide students to establish the concept of loving science, pursuing truth, daring to innovate and daring to express their own opinions.

In the process of teaching, in order to stimulate college students to study seriously, practice actively, discuss extensively and think actively, realize the comprehensive recognition of cognition, emotion, rationality and behavior, and cultivate socialist core values imperceptibly.

## **4. Evaluation Mechanism**

In order to realize the course education, it is necessary to introduce the ideological and political content assessment mechanism and pay attention to the process assessment combined with the course. "Principles of Computer Organization" is a compulsory course for software engineering and computer science and technology majors. It is usually assessed by means of examination, and the final scores are given with different proportions of classroom notes, computer practice and learning experience. In order to realize the curriculum education, ideological and political education should be combined with professional courses. Therefore, it is necessary to optimize the assessment methods, introduce the ideological and political content assessment mechanism, realize the diversification of assessment methods, and use the classroom summary, homework, scientific research and innovation project results display to measure the results, so that students can pay attention to the learning process and develop good learning habits.

#### **4.1. Classroom Summary**

10 minutes before the end of the class, please summarize and explain the knowledge and thoughts learned in this class. The teacher will summarize and sublimate and assign homework after class. This paper examines the summary of students' knowledge and the teaching effect of Ideological and political education.

#### **4.2. Operation**

Arrange homework for students to collect data, list the policies and main participating institutions or companies in tackling high-end universal chips, encouraging storage devices, buses, processors, etc., and examine students' understanding of the industry ecology.

#### **4.3. Scientific and Technological Innovation Projects**

Encourage students to participate in the innovation and entrepreneurship plan of university level and provincial level, and actively participate in innovation and entrepreneurship combined with comprehensive professional knowledge, so as to prepare for entering the society.

## 5. Conclusion

The cultivation of students by university professional teachers is not only to impart professional knowledge, but also to cultivate students' independent thinking ability, correct outlook on life and world outlook. University teachers should organically combine the professional knowledge teaching with the ideological and political education of college students. The ideological and political education should run through the whole process of the course teaching. The construction of the ideological and political education of the course should be constantly bold and innovative, and the integration of current events and breakthroughs should be made.

In the process of implementing ideological and political teaching, there are still some problems that need to be further analyzed and solved. For example, in the teaching methods of Ideological and political courses, students can be encouraged to mine their own ideological and political points, express their personal views, or discuss collectively, so as to strengthen their participation in the ideological and political teaching process; in the guidance of Ideological and political content, students are required to combine the industry hot spots and development history, Guide and review China's great achievements in the past 40 years of reform and opening up.

In short, the research and discussion of Ideological and political teaching is always on the way, teachers of professional courses should adhere to the principle of moral education, set an example and teach by example. In the teaching process of professional courses, let students understand the national conditions, enhance their professional knowledge, enhance their sense of social responsibility, enhance their ability of innovation and entrepreneurship, have better professional ethics, and cultivate excellent comprehensive talents.

## Project Source

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