

# Research on Ideological and Political Education in the Course of "Microcomputer Principles and Interface Technology"

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**Abstract:** Lesson is an important manifestation of implementing moral education and educating people through teaching. This paper combines the characteristics of the course "Microcomputer Principles and Interface Technology", analyzes the goals and ideas of ideological and political education in this course, discusses the details of specific implementation plans, predicts the expected results, and finally summarizes the ideological and political construction plan of this course. The research on ideological and political education in this paper lays the foundation for improving students' ideological quality, theoretical depth, and practical ability.

**Keywords:** Teaching and educating people; Ideological and political education; Ideological quality; Theoretical depth; practical ability.

## 1. Introduction

The overall goal of ideological and political education in the curriculum is to achieve the same direction of knowledge education and ideological and political education, and to deeply integrate knowledge transmission and education. While imparting knowledge, education on worldview, outlook on life, and values should be carried out to achieve the teaching goal of mutual promotion between knowledge education and ideological and political education [1].

Under the premise of strictly implementing the established talent cultivation plan, integrate ideological and political elements into the course of "Microcomputer Principles and Interface Technology" in a reasonable manner [2-3]:

- (1) Cultivate students' firm socialist and communist ideals and beliefs;
- (2) Cultivate students with good professional literacy;
- (3) Cultivate students' rigorous scientific attitude and teamwork spirit;
- (4) Cultivate students' spirit of innovation.

Furthermore, it is necessary to effectively integrate with social practice, break through innovation in the existing practical teaching mode of ideological and political courses, and construct a "walking ideological and political course" practical education mode based on the concept of practical education, effectively connecting the ideological and political small classroom and the social big classroom.

## 2. Course Characteristics and Ideological and Political Construction Ideas

In recent years, the emergence of new technologies and concepts such as intelligent manufacturing and low power consumption has brought a large and rich ideological and political elements to the course of "Microcomputer Principles and Interface Technology", as well as new challenges. The course of ideological and political education plays a very important role in guiding and inspiring the value of IoT

courses, and it is necessary and feasible to incorporate ideological and political elements into the curriculum [4]. Based on the teaching content and characteristics of this course, we will discuss and explore the ideological and political construction of the course, deeply analyze the goals and methods of ideological and political construction, and enable college students to gradually establish a correct worldview, outlook on life, and values [5].

For this course, teaching based on the core position of CPU in computers is necessary to uphold the leadership position of the Party; Teaching the development history of computers and microprocessors to educate students on the first principles of matter; Introduce the principles of the relationship between the whole and parts in the teaching of various components of computers; Guide the education of teamwork spirit in the teaching of bus operation and sequential content. Ultimately, through the integration of knowledge education and ideological and political education, the overall goal of synergy and ideological and political education is achieved.

## 3. Measures for Ideological and Political Construction

The most important measure in ideological and political construction is the collection and organization of ideological and political elements. This article provides some examples of ideological and political elements, as follows:

- (1) The development of computers: It can be divided into several stages, with the first generation being electronic tube computers, the second generation being transistors, and the third generation being small-scale integrated circuit computers. At the same time, the functions of computers continue to be powerful, and their running speed has also significantly improved. However, the development at this time lacked a dominant core until the emergence of the fourth generation of large-scale integrated circuit computers. At this stage, the core position of the CPU was confirmed. The role of the CPU is very significant, not only in its rapid development, but also in the rapid development of instruction set architecture, operating systems, various high-level

languages, and application programs, which can be said to have made a huge contribution to the development of the entire computer.

Ideological and political elements: Since the reform and opening up, our party has created, adhered to, and developed socialism with Chinese characteristics, fundamentally realizing the great ambition of China's national prosperity and strength. From this process, it can be concluded that the core oriented concept is very important for a country and a political party [6-7]. For college students, this scientific leadership theory can enhance their sense of social responsibility.

(2) Experience of supercomputing in China: From the perspective of computer development, China started relatively late in the field of computer science compared to other developing countries, but made rapid progress. Summarizing the development in the past 30 years, it can be seen that after the hard work and research of scientists, China's supercomputing industry has gone through three breakthrough stages: "starting", "concentrated breakthrough", and "accelerating catch-up". In 1997, the world's first trillion time supercomputer was born; In 2001, the "Global Top 500 Supercomputers" were announced, but at this time, there were no Chinese companies on the list; In 2016, the "Shenwei · Light of the Taihu Lake" independently developed by China topped the list and achieved an important breakthrough; In 2018, 206 units in China were listed in the "Global Top 500 Supercomputers". This indicates that the development of supercomputing in China is very rapid.

Ideological and political elements: By introducing China's achievements in the field of supercomputing, students are guided to understand the rapid development of China's supercomputing industry. Furthermore, guide students to gradually establish the "four confidences", namely confidence in the path of socialism with Chinese characteristics, theoretical confidence, institutional confidence, and cultural confidence. From this, cultivate students to develop a spirit of hard work, courage to overcome difficulties, fearlessness, courage to move forward, and continuous struggle. And cultivate students' determination and attitude to love and apply to the motherland.

(3) The working principle of the CPU: The CPU, also known as the central processing unit, is the operational and control core of a computer. Its main function is to interpret computer instructions and process data in computer software. The CPU is composed of an arithmetic unit, a controller, registers, a cache, and a bus that implements the data, control, and status connections between them. The development of CPUs can to some extent reflect the development of chips in China. Compared to the development status abroad, China's CPU development is relatively late, but progress is relatively fast. Some core fabrics rely on imports. Famous domestic CPU brands include Huawei Kunpeng, Feiteng CPU, Haiguang CPU, Longxin, Zhaoxin, Shenwei, etc [7]. At present, high-performance central processing units (CPUs) mainly rely on imports, which are not only expensive but also often limited, posing a threat to the security of national information systems.

Ideological and political elements: The chip ban imposed by the United States on China's ZTE and Huawei companies has suppressed the development of China's chip industry, such as listing Huawei, Hikvision, and other companies on the economic blacklist in 2019. In 2021, the FCC voted to advance the plan to ban the use of devices such as Huawei and ZTE in US telecommunications networks. The

importance of the chip industry for national development is self-evident, as its development represents a country's comprehensive strength. This inspires students to work hard and strive for excellence. Strive to make contributions to China's chip development as soon as possible.

(4) Experiment - Expanding Interrupt Controller: Experiment Content includes Familiar with the environment and device arrangement of the HQFC-A series USB microcomputer interface experimental platform; Master the connection method and operation process between the experimental platform and the upper computer; Master the management of interrupt controller 8259; Master the extension interrupt. Experimental instruments include: One microcomputer; The HQFC-A series USB microcomputer interface experimental platform system includes several cables and wires.

Ideological and political elements: In this experimental phase, there will be many components in the hardware connection. It can be associated with the ecological and environmental protection concept of "green water and green mountains are golden mountains and silver mountains", which teaches students to save costs and choose components reasonably [8]. Used components should not be thrown away casually. Make students aware of environmental protection and conservation awareness. In the experiment, students are grouped and collaborated to develop their teamwork skills.

(5) Microcomputer application - infrared thermometer: The size of the external radiation heat on the surface of an object, the different heat differences obtained by thermal sensors, and processed by electronic technology and software technology to present images with different brightness or color differences, which is commonly referred to as infrared thermal imaging; After converting the surface heat of the radiation source through thermal radiation algorithm operation, the conversion between thermal image and temperature is achieved.

Ideological and political elements: Infrared thermometers play a key role in ticket checkpoints, universities, and other areas. In particular, it played an important role in the prevention and control of COVID-19. To stimulate students to study professional knowledge seriously, generate strong interest, and enhance innovation awareness and ability [9].

(6) Registers: The 8086 CPU contains 14 16 bit registers, which are further divided into general data registers, segment registers, and control registers. Each register in each class has different functions. For example, registers such as BP, SP, SI, and DI can store general data just like other registers, but only they can store offset addresses.

Ideological and political elements: Each register has different functions, but it needs to be combined to enable the CPU to effectively execute and process various operations [10]. This reflects team spirit. In a team, individuals are different but need to collaborate with each other to complete team tasks.

## 4. Expected Results

The introduction of ideological and political elements cultivates students' dialectical thinking, develops correct outlooks on life, values, and the world, transforms students' traditional ideological concepts, and further promotes the healthy growth of students' personalities. At the same time, constantly injecting new teaching content and ideas into various dimensions and aspects of professional teaching. During the teaching, the students' enthusiasm for learning was mobilized, and the two-way cultivation of theory and practice

was carried out. At the same time, their professional ethics and self-restraint were cultivated, laying a good foundation for future study and work. Therefore, the teaching was widely recognized by students.

## 5. Summary and Outlook

This article discusses the construction of ideological and political education in the course "Microcomputer Principles and Interface Technology". The introduction of ideological and political elements cultivates students' dialectical thinking and develops correct outlooks on life, values, and the world. Students have shifted from not paying much attention to realizing their profound significance and role, transforming their traditional ideological concepts and further promoting the healthy growth of their personalities. The above aspects have important practical significance for achieving the educational and teaching goals of cultivating morality and cultivating talents.

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