

Teaching Exploration of the Ideological and Political Teaching of Fundamental of Electronic Technology Based on Non-Electrical Information Majors

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Abstract: Based on the curriculum ideology and politics of electronic technology basics for non-electricity majors in Chengdu University of Information Technology, the necessity of developing curriculum ideology and politics and the general idea of curriculum construction are expounded, and the organic integration of professional knowledge and ideological and political elements is discussed in depth. Finally, putting forward a further research plan is to break through the difficulties existing in the current ideological and political construction of the curriculum, and finally realize the fundamental task of “cultivating morality and cultivating people” in colleges and universities. The ideological and political effect of the course is remarkable, which can provide a reference for the teaching exploration of ideological and political courses in other professional courses.

1. Introduction

In 2019, the General Office of the State Council issued “Several Opinions on Deepening the Reform and Innovation of Ideological and Political Theory Courses in Schools in the New Era”, requiring that ideological and political education be integrated into the talent training system, and the Guiding Outline for Ideological and Political Construction of Colleges and Universities was formulated and issued.

In order to carry out the spirit of the meeting, put ideological and political work throughout the whole process of education and teaching, so as to realize the educational and teaching goal of cultivating people with morality. Curriculum ideological and political education is not a course, but a way of thinking that breaks the isolation between ideological and political education and professional education. It takes cultivating students' ideological and political work as the primary goal of Curriculum teaching, and takes professional course teaching as a means to integrate the moral education elements of professional courses intentionally, organically and effectively in the teaching process. Guide students to establish healthy goals and correct values when cultivating students' professional knowledge and skills.

Promoting the ideological and political construction of courses is an important measure to adhere to the socialist direction of running a school and implement the fundamental task of building morality and cultivating people. It is of great significance to achieve the goals of value shaping, ability training, and knowledge imparting.

2. The Necessity of Ideological and Political Courses in Fundamental of Electronic Technology

Professional courses are the basic carrier of course ideological and political construction, and the most direct mediator and variable affecting students' development. The quality of course teaching directly determines the level of talent training.

Fundamentals of Electronic Technology is a course that reflects the natural laws of objective things. It is an important professional basic course offered by Chengdu University of Information Technology for non-electrical majors such as computer science, Internet of Things, and machinery.

It is also a basic course for cross-integration among various disciplines. The course, teaching object for freshman, is a combination of two important theoretical courses, “circuit analysis” and “analog circuit”, the main research circuit analysis of the basic laws, basic theorem, the basic methods and principle of electronic devices and analog circuit analysis, application and design, is a course that faces application and learns to solve practical engineering problems.

In 2017, the course team carried out a student-centered and hybrid teaching model with Rain Classroom as a bridge between online(MOOC+SPOC) and offline to strengthen education and teaching research. Through the analysis of learning situation, the teaching quality has been significantly improved in the students' theoretical knowledge literacy, circuit analysis ability, practical innovation design ability, teamwork ability and so on.

However, in the process of knowledge imparting, teachers' ideological and political education remains in the form, neglects to guide and shape students' correct world outlook, outlook on life and value system, and fails to deeply integrate curriculum teaching objectives and moral education objectives to realize the specialization of socialist core values. Therefore, the teaching effect is not ideal, and it is difficult to realize the moral education effect.

Therefore, the main task of this paper is to thoroughly sort out the teaching contents, combine with the characteristics of the major, and dig deep into the cultural genes and value elements contained in the teaching process, and the organic combination of “teaching” and “education”, reshape students value system, and cultivate students' ability to think, be realistic and pragmatic, and to innovate.

3. The Thought of Course Ideological and Political Construction

The new teaching design is implemented in combination with the characteristics of this course, guided by the socialist thought with Chinese characteristics in the new era, and the curriculum education goals, moral education elements, and ideological and political elements are included in the teaching plan as an important consideration in classroom teaching, and adherence to knowledge imparting and value. The combination of leadership and the use of teaching cases for cultivating college students' national spirit, the spirit of the times, social responsibility, etc., comprehensively improve college students' relationship analysis and development. The ability to make progress enables students to become talents with both ability and political integrity and all-round development.

This course combines the CDIO teaching mode in the teaching process to cultivate and construct ideological and political talents (Figure 1). In terms of teaching methods, methods such as guided inquiry and analogical reasoning are used to guide students to gradually enter the topic to think, and effectively realize the transfer of knowledge. In terms of teaching methods, many media materials such as video, animation, blackboard writing and multimedia technology are used to display to students, activate students' thinking, improve learning interest and teaching effect, and integrate ideals and beliefs into knowledge learning that is silent and dripping. Spiritual guidance.

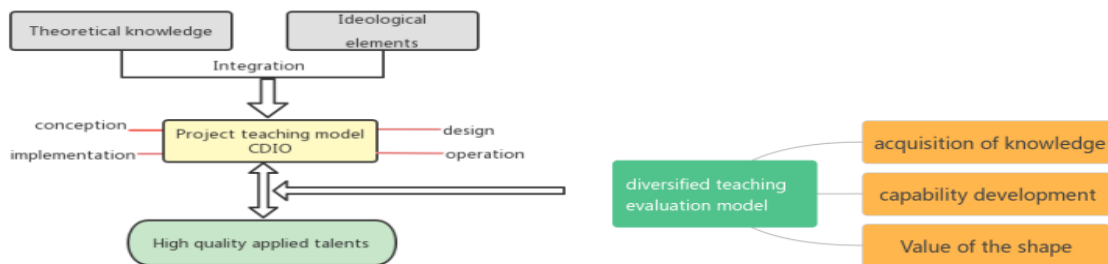


Fig.1 The Thought of Course Ideological and Political Construction

4. Ideological and Political Case Design

Focusing on the knowledge points of circuit analysis and analog circuits in this course, integrate relevant ideological and political cases to expand the value. Some of the case designs are shown below.

4.1 Education for Patriotism and Power of Science and Technology

When teaching the basic concepts and physical quantities (U, I, P) of circuits, combined with the current hot topics, For example, “Tianwen No. 1” visited Mars, eliciting inspirational stories from the scientists (Volt, Ampere, Watt, Kirchhoff, etc.) The correct learning concept and values of science and technology serve the country, cultivate the sense of home and country of science and technology, and inspire students' sense of responsibility to strive for a strong country with science and technology.

4.2 Scientific Attitude and Artisan Spirit Education

When teaching the knowledge points of the transient response of the first-order RC circuit (Figure 3) using the three-element method, it is only necessary to solve the three element values in the general formula of the full response of the RC circuit, namely: the initial value $f(0+)$, steady state value $f(\infty)$ and time constant τ . Then according to the theoretical analysis, the voltage response $u_c(t)$ and the current response $i_c(t)$ can be solved.

$$\text{full response formula: } f(t) = f(\infty) + [f(0+) - f(\infty)]e^{-\frac{t}{\tau}} \quad \textcircled{1}$$

$$\text{voltage response: } u_c(t) = u_c(\infty) + [u_c(0+) - u_c(\infty)]e^{-\frac{t}{\tau}} = 5e^{-50t} (t \geq 0) \quad \textcircled{2}$$

$$\text{current response: } i_c(t) = -\frac{u_c(t)}{R} = -50e^{-50t} (mA)(t \geq 0) \quad \textcircled{3}$$

Use classroom demonstration experiments for verification and comparison with theoretical analysis to help students quickly understand knowledge points.

In the first-order RC circuit, the switch realizes full response from “1” to “2”, combined with the output response curve (Figure 3), it is understood that its essence is to fully charge and then discharge, and guide students to establish “practice is the only standard for testing truth, No one step can go a thousand miles” scientific thinking, cultivating students rigorous scientific attitude and pioneering and innovative spirit.

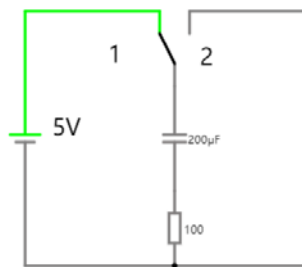


Fig.2 The First-Order Rc Circuit

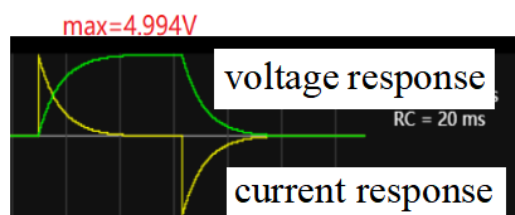


Fig.3 The Output Response Curve $U_c(t), I_c(t)$

4.3 Materialist Dialectics Education and Humanistic Feelings

The materialist dialectics education content is added to the classroom lectures, and the classroom lectures are conducted in the teaching method of layer-by-layer demonstration, interlocking, and

heuristic education, and subtly introduce ideological and political elements to cultivate students' logical thinking ability. For example, when teaching the single-stage transistor amplifier circuit, the students are organized to think by introducing interesting ways of amplifying money (Figure 4).

[Question 1] When the amplifier circuit has suitable parameters, analyze and discuss whether the circuit can be realized from the concept of the amplifier circuit. In the process of discussion, the essence of introducing circuit amplification is energy conversion and control, that is, the DC power supply in the circuit is converted into output signal energy, and then transistor elements are used to achieve energy control, so that the load can obtain the output signal energy from the power supply. According to the definition, whether the dialectical analysis circuit can be amplified is determined by the component ①. If component ① is GND, the circuit cannot be realized without following the law of conservation of energy; if component ① is VCC, which provides energy for the circuit, the transistor can realize the conversion of energy, and the circuit can be realized. Extending to the reality of life, one should seek truth and be pragmatic in doing things; one's own peace of mind comes from moving forward under the burden of others, leading to gratitude education.

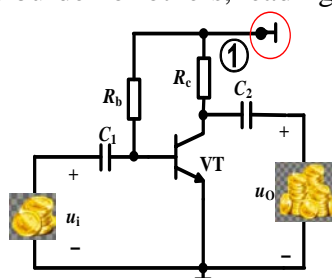


Fig.4 Amplifier “Circuit” Diagram

[Question 2] When the input signal is a sine wave, analyze the output signal. By adopting the analogy learning method of input signal gold coin and sine wave, it is deduced that the characteristic of the amplifying circuit is power amplification, and the basic task is to amplify the signal without distortion (Fig. 5), which effectively realizes the transfer of knowledge.

Through the progressive problem guidance layer by layer, gradually put forward several key problems of the amplifier circuit, guide students to think and analyze, quickly understand the key problems in the analysis process, and expand and extend the problem to achieve the purpose of bypassing analogies and experience the circuit. Subtle and effective integration of ideological and political education and professional teaching.

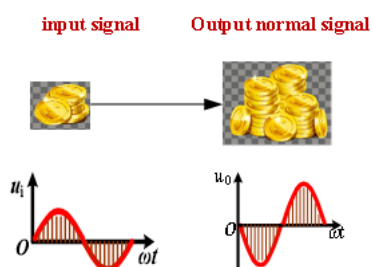


Fig.5 Characteristics and Basic Tasks

5. Conclusion

This paper explores the reform of ideological and political teaching in the basic courses of electronic technology for non-electrical information majors, analyzes the necessity of ideological and political courses, digs deep into the ideological and political cases in the course, and sorts out the ideological and political elements such as dialectics, materialism, and scientific views, embodied in the knowledge system. Through the improvement of teaching syllabus, lesson plans, teaching assessment and evaluation, and improvement of teaching methods and methods, we will explore new concepts of ideological and political education in the new era, and a curriculum ideological and political model that conforms to the characteristics of the school's own specialty.

All-round education. The author's subsequent research focuses on solving the difficulties in the ideological and political construction of curriculum in the new era, such as the integration of professional knowledge and ideological and political education, and the integration of teachers' role as a link.

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