

Exploration and Practice for Electronic Technology Course Integrated into Ideological and Political Education

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Abstract: Under the background of the ideological and political construction of specialized courses, teachers should fully explore and integrate the elements of ideological and political construction in the curriculum according to the characteristics of their specialized courses. Ideological and political teaching is integrated in the specialized course naturally. The teachers of specialized courses in universities assume the new role of professional education and ideological and political education. Electronic technology is one of the important required courses for the major of mechanical design, manufacturing and automation. On the basis of analyzing the characteristics of electronic technology course, the integration of electronic technology course content and ideology and politics is explored. The ideological and political reform of electronic technology course from the aspects of the exploration point of ideological and political integration into the course content, and the means of ideological and political content integration into the specialized course in the class is explored. It provides a useful reference for the reform of specialized courses integrated into ideological and political education.

1. Introduction

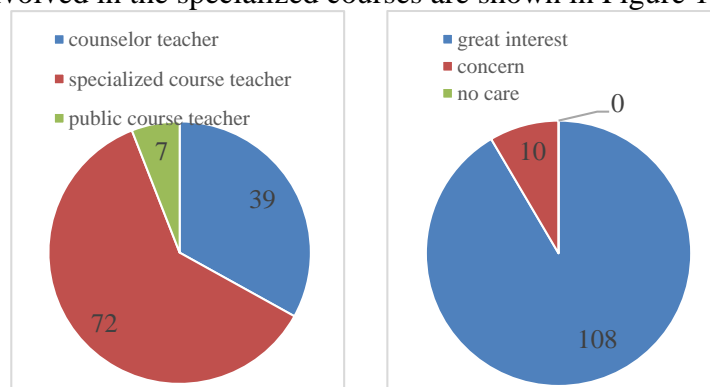
At present, the teaching of specialized courses in universities generally focuses on explaining professional knowledge and ignores moral cultivation. Moral cultivation of the students mainly depends on ideological and political workers in universities^[1-3]. However, the frequency of meeting between specialized course teachers and students is much higher than that of ideological and political teachers, and the number and lesson hours of specialized courses are much higher than that of ideological and political teachers. For example, the participation of specialized course teachers in curriculum ideological and political education can effectively improve the effect of curriculum ideological and political education and achieve the goal of moral cultivation in the process of imparted knowledge. The development of China's manufacturing industry needs large excellent mechanical manufacturing and automation professionals^[4-5]. Electronic technology is an important core specialized course combining theory and practice for the major of mechanical design,

manufacturing and automation [6-7]. In this paper, in order to achieve the effect of teaching and educating students, electronic technology is used as the carrier to deeply explore the specialized content of the course and ideological and political integration points, the means of ideological and political content integration into the specialized course in the class.

2. New Position of Specialized Course Teachers' role under Ideological and Political Education Background

Cultivating morality and cultivating student is the fundamental task of education. However, the teaching mode of specialized courses always emphasizes knowledge imparts of specialized courses and neglects moral cultivation. This is in conflict with the task of cultivating morality and cultivating student. Under the background of ideological and political education, specialized course teachers should re-position their roles and adapt to the dual roles of professional and ideological and political education [8]. In recent years, specialize courses in universities have been trying to integrate into ideological and political reform [9-10]. Although the teachers of specialized courses in universities are not full-time ideological and political teachers, they should be the participants of ideological and political education to achieve the goal of collaborative education between specialized course teachers and ideological and political workers. Facing the challenge of assuming the dual roles of professional education and ideological and political education, teachers of specialized courses strive to strengthen the study of ideological and political theory and improve their ideological and political level. The teaching of professional knowledge is as the main body for the teachers of specialized course. The specialized course teachers integrate the ideological and political education into the whole process of teaching and education of students through the integration of teaching content and ideological and political content. This gives full play to the main position of classroom teaching, correctly guides students' values and responsibility consciousness, and guides students to study and live with positive and healthy thoughts. It can be well implemented and completed ideological and political education in the specialized courses.

The questionnaire method for practice is adopted for the students of Grade 2022 majoring in mechanical design, manufacturing and automation in the school of mechanical and electrical engineering of Heilongjiang University. Figure 1 (a) shows the teachers who have the greatest influence on the formation of good character in the school. The attitudes of students on ideological and political topics involved in the specialized courses are shown in Figure 1 (b).



(a) Teachers who have a great influence on students (b) Students' attitude towards the learning of ideological and political content in specialized courses

Figure 1: Research report.

A total of 118 students of Grade 2022 mechanical design, manufacture and automation participated in the survey report. 72 students chose specialized course teachers, 39 students chose

counselor teachers, and 7 students chose public course teachers. It can be seen that in the process of shaping students' good character, specialized course teachers are already one of the important factors. In the survey of students' attitudes about ideological and political topics in the class learning of specialized courses, 108 students expressed great interest, 10 students expressed concern, and 0 students chose not to care. The number of interested students accounted for 91.5% of the total, which indicates that most students majoring in mechanical engineering and automation can accept the appropriate insertion of ideological and political content in specialized courses, and the students had some interest in and expectations for the insertion of ideological and political content.

3. The Main Exploration Point of Electronic Technology Course Content and Ideological and Political Integration

The main contents of electronic technology courses are semiconductor devices, basic amplifier circuits, integrated operational amplifiers, feedback in electronic circuits, direct current regulated power supplies, gate circuits and combination logic circuits, flip-flops and sequential logic circuits. According to the characteristics of electronic technology course, the integration of ideological and political content into specialized course mainly focuses on several aspects such as dedication education, shaping good character education, rigorous work style and responsibility education.

3.1. Self-improvement, Dedication and Hard-working Spirit

Taking semiconductor devices as an example in Chapter 1, in the introduction of conductor devices, the development history of semiconductors in China and the achievements today is introduced by text and pictures, and then the short videos of breakthroughs made in semiconductor quantum chips in China is inserted. The integration of ideology and politics can increase students' sense of identity of the major and cultivate students' national pride and patriotic feelings. If China wants to promote the development of semiconductors, it is still necessary to overcome the "stuck neck" problem by itself. China has made a lot of efforts to become the world's largest semiconductor equipment market. Train students to face difficulties to challenge themselves, hard work and unyielding spirit. These specialized course contents integrated into ideological and political education can reflect the necessity of engineers to learn specialized knowledge, stimulate students' enthusiasm for learning specialized courses, increase students' sense of identity in this major, and cultivate students' spirit of self-improvement, dedication and courage.

3.2. Shaping Good Character Education

The integration of ideological and political education into the electronic technology course is conducive to helping students to shape a good character and cultivate the correct three perspectives. Taking the character of shaping cooperation and team spirit as an example, the integrated operational amplifier includes a differential input stage, a voltage amplification stage in the middle and a power output stage in the third chapter. These three circuits have its own advantages and disadvantages. Once they combined together for the integrated operational amplifier, it can make use of its strengths and avoid weaknesses. It not only reflects the play to their own strengths, but also reflects the spirit of inclusiveness of the team. In the explanation of the working principle of flip-flops and sequential logic circuits in Chapter 8, flip-flops are memory unit circuits that can only operate when the clock pulse signal is triggered. The flip-flop is composed of multiple logic gate circuits, which work together to realize the corresponding logic function. It reflects the idea of cooperation and cultivates students to unite and cooperate with each other in study and life, and work together to exert collective energy.

3.3. Rigorous Work Style and Responsibility Education

Take the single-phase bridge rectifier circuit as an example in Chapter 5, the single-phase bridge direct current circuit includes a transformer, four diodes D1 to D4, and the load. After explaining the working principle of the complete rectifier circuit, the teacher can ask the students a question. What if the diodes D1 and D3 in the rectifier circuit are reversed? In guiding the students to answer that the reversed D1 and D3 diodes will cause a short circuit in the secondary winding of the transformer, and too much current will cause the transformer to burn. At this time, the teacher inserts ideological and political education to guide students to check and proofread in time when they finish their homework in order to reduce the error rate and cultivate a rigorous work style. In the future work, we should improve professional ethics and maintain a high sense of responsibility.

4. Ideological and Political Integration Way in Class for Electronic Technology Course

4.1. Multimedia PPT Presentation

Teachers of specialized courses use PPT courseware to add vivid pictures and appropriate text to the teaching content suitable for ideological and political integration. It imparts professional knowledge intuitively and introduces ideological and political education. Students can interact with the relevant parts of specialized course content and ideological education content displayed by teachers. Taking the introduction of semiconductors in Chapter 1 as an example, firstly, the teachers show the students physical pictures of various types of semiconductors through multimedia pictures. Secondly, ideological and political topics on the basis of specialized course teaching content is introduced, the questions are asked to the students such as whether they know that China has become the world's largest semiconductor market. Finally, students are shown pictures of China's unremitting efforts to become the world's largest semiconductor equipment market. The explanation of semiconductor specialized course content naturally integrates ideological and political content to stimulate students' national pride and strengthen the spirit of perseverance and hard work.

4.2. Short Video

Multimedia video teaching is full of pictures, texts, sounds and images, which is easy to mobilize students' emotions, attention and more sense of involvement. It is helpful for teachers to convey ideological and political education concepts and help students understand and master them. Taking integrated chip content as an example, the working principle of integrated chip is introduced. The development process of Chinese chip to the students is inserted for ideological and political education. By playing the video of a comprehensive review of the 60 years of development of Chinese chips from scratch, the teacher consciously guided the students to face difficulties, dare to challenge themselves and have the spirit of hard work and unyielding. Teachers of specialized courses combine ideological and political education and the teaching content of electronic technology course through the short videos to achieve the purpose of teaching and educating students.

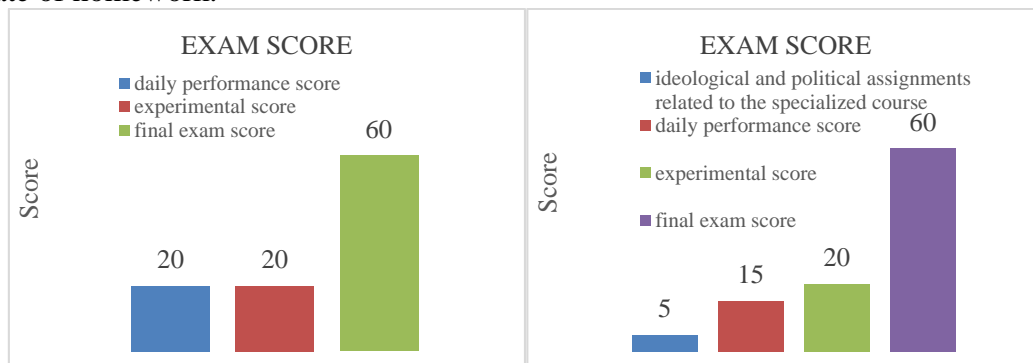
4.3. Interaction with Students Online and Offline

Making full use of software such as campus XUEXITONG, online and offline discussion interaction of teachers and students is one of the important forms of ideological and political integration in electronic technology course. Teachers of specialized courses can share the appropriate ideological and political materials related to the teaching of specialized courses with

students in the XUEXITONG software, and students can download and study independently at any time. The use of XUEXITONG software is also conducive to one-to-one guidance and communication with students who need guidance in ideological and political aspects. The teachers of specialized courses usually undertake multiple courses, and the teachers of specialized courses are basically teachers of their own college. Hence, the students have closer contact with and are more familiar with the teachers of specialized courses. When students feel confused, they maybe choose to communicate or seek help from specialized teachers who they trust more and are more willing to confide. Software such as XUEXITONG provides an important channel for teachers and students to build communication.

5. Electronic Technology Course Examination Assessment

Taking the electronic technology course of Grade 2022 students of mechanical design, manufacturing and automation of Heilongjiang University as an example, the ideological and political assessment is introduced into the electronic technology examination assessment. Before the teaching reform, electronic technology course scores accounted for 20 points in daily performance, 20 points in experiment and 60 points in final exam, as shown in Figure 2(a). The daily performance score is divided into 10 points for homework and 10 points for class performance. The score composition of electronic technology course after teaching reform is shown in Figure 2(b). On the basis of considering the effect of ideological and political integration in the specialized course, the after-class discussion homework involved in the course is taken as a separate ideological and political assessment. 5 points is added separately for ideological and political assessment. The daily performance score is adjusted to 15 points, which is composed of class homework and class performance. At the same time, ideological and political factors must be fully considered in the daily performance, such as the assessment of students' learning attitude towards completing homework, students' independent learning initiative and attendance assessment on the basis of the correct rate of homework.



(a) Composition of examination scores before the teaching reform (b) Composition of examination scores after the teaching reform

Figure 2: Composition of examination scores for electronic technology course.

In addition, a questionnaire survey was conducted among the Grade 2022 students. Take the single-phase bridge rectifier circuit as an example. In the single-phase bridge rectifier circuit, it will lead to transformer short circuit and other serious consequences once the diode D1 and D3 direction is connected reversely. At this time, the teacher will insert ideological and political education to guide the students to improve professional ethics and maintain a high sense of responsibility. The students are asked whether it affects them to maintain responsibility in the future work. 117 students (99%) were greatly influenced by their choice, which made them realize that they should maintain a high sense of responsibility in their work. One student (1%) said that it had a certain impact on

them, making them realize that it is best to maintain a sense of responsibility in work. No one chooses to have no effect on them. The results of the survey report show that almost all the students are willing to maintain a sense of responsibility and improve safety awareness. The questionnaire shows that the integration of specialized courses into ideological and political education can play a role in educating students.

6. Conclusions

With the development of ideological and political education reform in universities of China, teachers of specialized courses should adapt to assume the dual roles of professional and ideological and political education as soon as possible. The integration of electronic technology course content and ideological and political education mainly focuses on the aspects of self-improvement, love and dedication, the spirit of working hard, shaping good character education, rigorous work style and responsibility education. The ideological and political education are integrated into the classroom of specialized course by means of multimedia PPT presentation, short video and online and offline discussion with students to achieve better education results. Through the examination assessment and questionnaire majoring in Grade 2022 mechanical design, manufacturing and automation, it shows that the integration of specialized courses into ideological and political education can play a certain role in teaching and educating students.

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