



Exploration on ideological and political teaching of automotive electrical system course

Naifa Gong^{1,a*}, Yujie Gao^{1,b}, Junjie Wang^{1,c}, Peng Hang^{1,d}, Hua Gao^{2,e}
Jingjing Duan^{1,f}

¹Air Force Early Warning Academy, Wuhan, Hubei, 430019, China

²Wuhan College of Arts and Science, Wuhan, Hubei, 430019, China

^{a*}gong_naifa@foxmail.com, ^b894516784@qq.com

^c15172453692@163.com, ^d149064304@qq.com

^e1124615187@qq.com, ^f164726751@qq.com

Abstract. In order to cultivate all-round development of applied talents, professional courses and ideological and political courses are integrated into teaching, so as to achieve the educational goal of complementing each other. Integrating ideological and political elements into the teaching process can give full play to professional advantages, educate students through multiple channels, and achieve the goal of cultivating moral integrity. This article takes the professional course "Automotive Electrical System" as the research object. First, based on the current teaching characteristics of the course, it proposes ideological and political content applicable to this course. Then it focuses on the ideological and political elements of the course involved in the teaching process, builds a new model of ideological and political education, and enhances the accuracy of the ideological and political course. At the same time, it also provides reference ideas for integrating professional courses into ideological and political construction.

Keywords: automotive electrical system course, ideological and political teaching, education, teaching exploration.

1 Introduction

In December 2016, General Secretary Xi emphasized at the National Conference on Ideological and Political Work in Colleges and Universities that the ideological and political work in colleges and universities is related to the fundamental issue of what kind of people colleges and universities train, how to train people, and for whom to train people [1]. We must insist on cultivating moral character as the central link and integrate ideological and political work throughout the entire process of education and teaching [2]. In May 2020, the Ministry of Education issued the "Guidance Outline for the Construction of Ideological and Political Curriculum in Colleges and Universities" which further clarified the role of professional courses in ideological and political education in college education and established a comprehensive pattern of all-round edu-

cation for all students [3]. It clarifies the importance of ideological and political education in the process of cultivating talents in colleges and universities. Teachers should achieve all-round education in the teaching of professional courses, focusing on political identity, feelings of family and country, cultural literacy, and professional ethics. Therefore, "curriculum ideological and political education" is an important task in implementing the party's education policy, and is also an inevitable requirement for the reform of teaching models [4].

Traditional teaching objectives and pure theoretical teaching do not meet the requirements of cultivating college students with comprehensive development of comprehensive abilities. The promotion of "curriculum ideological and political education" fundamentally solves the comprehensive training of students and integrates quality cultivation and moral cultivation [5]. At present, there are many papers on the integration of ideological and political courses into courses. Zhou Qi added ideological and political elements to the basic course of mechanical design and carried out teaching exploration and practice [6]. Li H took the electric vehicle power battery and its management technology course as the research object, discussed the necessity of ideological and political implementation of the course, course characteristics, overall design ideas of the course, and course teaching implementation, and explored the integration and implementation of ideological and political courses in professional courses [7]. Lin X Y's teaching practice of ideological and political courses has enhanced students' interest in course learning, which helps to achieve the trinity talent training goals of value guidance, ability cultivation, and knowledge transfer [8]. Li Lei integrates ideological and political elements into the teaching of basic courses in mechanical manufacturing majors. Achieve the unity of teaching and educating people, thereby cultivating all-round development of higher vocational talents [9].

Automotive electrical system is a professional basic course in automobile repair. The course is composed of theoretical courses and practical courses, mainly combining teaching content related to automobile construction and electrical engineering basics, integrating theory with practice. The course plan clearly clarifies the objectives and directions of the teaching. Through the teaching of theoretical courses, students can understand and master the relevant knowledge of circuit diagrams and components. The practical courses mainly include the diagnosis and troubleshooting process of measuring circuits and related faults.

In the past teaching process, automotive electrical system courses mainly cultivated students' practical abilities, neglecting the cultivation of physical and mental qualities, professional norms, and teamwork. This article will explore how to introduce ideological and political elements into the automotive electrical system course to promote the all-round development of students.

2 Ideological and Political Goal Setting

The automotive electrical system course is a basic course for the automotive repair major, including theoretical courses and practical courses. Although they are separated from each other in the teaching process, they are closely related in the connection of

content and the inheritance of knowledge. At the same time, in the teaching process, the link of ideological education is missing, and the concept of cultivating people with moral integrity cannot be fully implemented. As a professional course teacher, in addition to the inheritance of knowledge during the teaching process, it is also necessary to cultivate students' safety awareness, cultural literacy, adaptability and other abilities [10]. To this end, based on the training objectives of the teaching plan and the ideological and political considerations of the course, the ideological and political objectives of the course suitable for the automotive electrical system course were formulated.

2.1 Cultivate Safety Awareness in Internship Sites

The automotive electrical system course covers a wide range of knowledge. In addition to having a clear understanding of the structure of the car, it also requires disassembly and assembly measurements of the electrical components on the car. During the operation, it often happens that students fail to follow the internship steps. Failure to pay attention to the safety risks that may occur during the internship process, such as sparks generated due to incorrect selection of measurement gear when using a multimeter, failure to operate in accordance with safety requirements during battery disassembly and assembly, and misoperation when measuring the starter. Vehicles rush out and so on. Therefore, it is necessary to enhance students' safety concepts during the automotive electrical system internship class, which can not only standardize students' operations, but also lay good safety habits for students to move to the workplace.

2.2 Develop Good Professional Qualities

The main professional qualities discussed in this article include dedication to work, sense of innovation, and the spirit of great craftsmanship.

As a student, you will step into your own job in the future, and you need to be dedicated to your job. The existence of a job is often a need for the existence and development of human society. Therefore, dedication and dedication are not only a need for personal survival and development, but also a need for social existence and development. Dedication to work and dedication is an ordinary spirit of dedication, because it is something that everyone can do and should have; dedication to work and dedication is also a great spirit of dedication, because greatness comes from the ordinary. Without ordinary dedication to work, there would be no greatness of dedication.

Innovation refers to using existing thinking patterns to propose insights that are different from conventional or ordinary people's thinking, using existing knowledge and materials to improve or improve in a specific environment based on ideal needs or to meet social needs. Create new things and obtain behaviors that have certain beneficial effects. The main content of the automotive electrical system course is to familiarize yourself with the circuit on the vehicle and diagnose and eliminate electrical faults in the vehicle based on the circuit diagram. However, different maintenance personnel repair different models and have different circuit diagrams. Therefore, students need to continuously improve their car fault diagnosis solutions based on the knowledge they have learned, and ultimately form their own set of solutions to the problem. At the same

time, the automotive electrical maintenance industry is an industry that requires the accumulation of knowledge. After students enter the workplace, they must have a spirit of study every day for ten years. This requires students to be able to concentrate on study and study and have the spirit of a great country's craftsmen.

2.3 Familiar with the Latest Industry Developments

The automotive electrical repair industry involves a wide range of industries and penetrates into every aspect of our lives. As a car mechanic, the most basic requirement is to focus on reality, and you also need to understand the introductory knowledge of the automotive industry. However, in actual courses, the integration with modern automobile industry knowledge is often ignored, and the courses are conducted behind closed doors and divorced from reality. Therefore, it is necessary to add knowledge about industry development and advanced manufacturing technology to the curriculum. This will help students understand the industry, have a certain understanding of future development, and be helpful for improving their own abilities. A certain direction can also broaden students' horizons and increase the breadth of knowledge.

2.4 Learning to Work with Each Other

How to solve automobile electrical system faults is an important part of students' learning and working process, and it is a reflection of students' ability to do their jobs [11].

In the actual teaching process, it is often encountered that when students encounter problems, they do not actively think about how to solve the problem through their own understanding, but directly ask the teacher or leave the problem alone. Therefore, during the teaching process, some questions will be deliberately set up to allow students to discuss and think, and finally jointly solve the car's electrical fault problem. This will not only train students' ability to solve practical problems, but also cultivate students' spirit of united writing.

3 Features of Automotive Electrical System Course

The automotive electrical system course adheres to the concept of "cultivating people with moral integrity" and aims to cultivate firm ideals and beliefs, comprehensive development of morality, intelligence, body, beauty and labor, a certain level of science and culture, good humanistic qualities, professional ethics and innovation awareness. Talents with meticulous work style, craftsman spirit of excellence, strong employability and sustainable development ability [12].

The course is divided into 5 parts, namely power system, starting system, lighting and signaling system, instrument and alarm system, and the entire vehicle circuit, as shown in the figure 1.

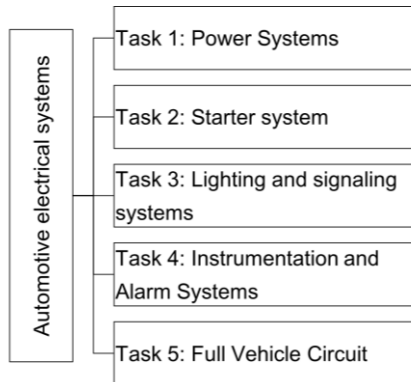


Fig. 1. Automotive Electrical System Content

This course mainly includes the knowledge and understanding of the structure, principles, characteristics, performance and testing of generators, starters, etc., so that students can quickly understand the relevant knowledge, technology and applications of automotive electrical systems. In the course, China's excellent traditional culture, socialist core values, craftsman spirit, and innovative spirit are implemented throughout the course. Moral education is subtly carried out in the teaching of professional knowledge, so as to cultivate students' love of work, dedication, integrity and other socialist core values, and inspire students' patriotism. Sentiment, enhance students' sense of identity and mission for the country and nation, and ultimately achieve the overall teaching goal of trinity of value shaping, knowledge transfer, and ability cultivation [12]. During the teaching process, it was discovered that the teaching of this course has the following characteristics.

3.1 The Principle is Abstract and Obscure, but the Operation is Highly Practical.

This course mainly explains the structure and working principles of automotive electrical system components. The principles mostly involve circuit diagrams, and the teaching content is abstract and difficult to understand. At the same time, each part has its own characteristic fault phenomenon, and the process of troubleshooting involves the use of multimeters, decoders and other components. And because it involves circuits, safety issues may easily arise during the troubleshooting process, which further increases the difficulty of troubleshooting for students.

3.2 Less Teaching Hours and Poor Learning Results

The course hours for automotive electrical systems in the automotive repair major are short and the time is tight. The course has a total of 68 hours, including 27 hours of theoretical classes and 41 hours of practical classes. The training period is three months. Often students have just started learning, and the entire course is over, and the training

effect is greatly reduced. To systematically master automotive electrical knowledge often requires students to continue learning through practice in subsequent work processes.

3.3 Lack of Ideological and Political Teaching Materials and Poor Initiative

Through careful reading of the teaching materials, it was found that the teaching materials mainly focused on theoretical and practical knowledge, and did not include ideological and political content in the curriculum. Instead, ideological and political elements of the curriculum were added to the teaching content. The ideological and political elements in courses generally focus on theoretical knowledge, but theoretical knowledge does not significantly help students enter the workplace and is difficult to improve students' active learning motivation.

4 Exploration on Ideological and Political Teaching

4.1 Course Ideological and Political Content Design

The automotive electrical system course is divided into theoretical courses and practical courses. The ideological and political elements of the course will be explored from the theoretical courses and practical courses respectively. The ideological and political requirements of the course run throughout, so ideological and political elements of the course are added to each teaching content. The ideological and political elements of the course are shown in Table 1.

Table 1. Ideological and political elements of the course

No.	Knowledge	Ideological and political elements
1	When the car is in use, the battery needs to be charged and discharged	The battery needs to be charged and discharged when it is used in the car. Similarly, when students learn knowledge in school, they are charging themselves. After learning knowledge, they can use their abilities in their own jobs, that is, discharge.
2	Automotive lighting can be divided into halogen headlights, LED headlights, xenon headlights and laser headlights	Domestic car headlights have slowly replaced imported car lights, and the prices are now very cheap. It is an example of the rise of my country's famous industrial industry and inspires students' sense of national pride.
3	During the process of fault diagnosis and troubleshooting, students need to discuss and solve problems together.	Students are required to have specific strategic awareness and cooperative communication skills, be able to express their ideas orally or in writing, communicate effectively with team members, and play their due role in the team.
4	The troubleshooting process requires step-by-step inspection against the circuit diagram until the cause of the fault is found.	After each trainee enters his or her own workplace, he or she must gradually complete the work in accordance with the operational requirements and possess good professional qualities. At the same time, we must calm down and gradually eliminate faults, and have the spirit of a great craftsman.

4.2 Exploration of Ideological and Political Methods in Curriculum

How to closely integrate the ideological and political content of the course with the automotive electrical system course has been a key issue that has been studied. Through teaching practice and exploration, combining teaching objectives and teaching characteristics, integrating the ideological and political content of the course into the course can not only complete the classroom teaching content, but also achieve the purpose of optimizing the ideological and political content of the course.

(1) Case teaching method

Incorporate actual cases into the teaching process of practical classes to guide students well. Explore the key points of the problem from actual cases so that students can better complete practical teaching tasks. For example, it was introduced that during a certain task, the maintenance personnel were charging the battery, but they did not follow the requirements and required all personnel to wait during the charging process. They charged directly at night, and there was no one in the charging room. As a result, water electrolysis continued after charging was completed, causing an explosion and the roof being blown off. Emphasize students' thinking about safety issues and cultivate students to develop prudent and standardized practical operating standards. Make them understand that failure to follow operating rules can easily lead to safety accidents.

(2) Discuss pedagogy

Combined with the characteristics of the automotive electrical system course, a thinking question is presented during the practice process for students to analyze and solve on their own. For example, when explaining the car wiper system, there is a difference between a four-pin relay and a five-pin relay during the circuit explanation. Then during the actual maintenance process, what will be the impact if the five-pin relay on the circuit is replaced with a four-pin relay. Finally, the students were asked to come up with their final conclusions and finally deduce if this type of fault occurs in the car, whether it may be caused by a relay problem. Combined with the content in the car construction experiment, select a discussion point for students to analyze, solve or summarize on their own.

(3) Integrating theory into teaching methods

During the course teaching, the latest technologies in current automobile development are introduced. For example, when explaining the automotive lighting system, you can introduce that automotive lighting can be divided into halogen headlights, LED headlights, xenon headlights and laser headlights, so that students can understand the benefits brought by the development of my country's automotive technology and guide students Loving the party and country, enhancing national self-confidence, and possessing mainstream values such as professionalism and innovative spirit will sow the seeds for students to become dedicated Chinese craftsmen in their future work.

5 Conclusion

The teaching model that integrates ideological and political and professional courses is crucial. It is a powerful tool to break the "island effect" between the two and is a core

issue that needs to be faced in curriculum teaching reform. The complementary advantages of ideological and political courses and professional courses encourage them to move in the same direction, and ultimately achieve the original intention of cultivating moral integrity and cultivating people. This article takes the automotive electrical system course as an example. It first sets the course objectives applicable to the course, then introduces the characteristics of the course, and finally introduces the ideological and political content of the course and combines a variety of teaching methods to analyze the ideological and political content of the course. Optimized.

Reference

1. I. E E ,V. D K . Modeling the Technological Process of the “Cup” Part in UML Language [J]. *Russian Aeronautics*, 2024, 66 (4): 864-870.
2. Ivan H ,Roman S ,Marián M , et al. Production and economic potential of hay and seed production from alfalfa (*Medicago sativa* L.) in a two-crop cultivation technology [J]. *Journal of Central European Agriculture*, 2024, 25 (1): 284-291.
3. V D Z , S S S . Simulation of the process of cultivation of phototrophic microorganisms in a multisection's photobioreactor [J]. *Izvestiya MGTU MAMI*, 2013, 7 (3-2): 165-171.
4. Tian H F. Curriculum Ideology and Politics: A practical path to integrate ideological and political education into the teaching of professional courses in colleges and universities [J]. *Future and Development*, 2018, 42(04): 99-103.
5. Zhou Y Q. Identification of Chinese sports spirit and socialist core values [J]. *Ideological Education Research*, 2016(04):57-60.
6. Zhou Qi. Discussion on the teaching design of basic mechanical design courses integrating "curriculum ideological and political education" [J]. *Times Automobile*, 2021(23):91-93.
7. Li H. Exploration on the ideological and political implementation of the course "Electric Vehicle Power Battery and Its Management Technology" [J]. *Times Automobile*, 2021(24):32-33.
8. Lin X Y. Exploration and practice of ideological and political construction of the "New Energy Vehicle Technology" course [J]. *Times Automobile*, 2021(24):72-73.
9. Li L. Exploring the ways and methods to integrate "curriculum ideological and political education" into the basic courses of mechanical majors in higher vocational colleges [J]. *Times Automobile*, 2021(23):102103.
10. Liu J C. Analysis of the reflection and training path of safety awareness and safety education in production [J]. *Chinese and Foreign Entrepreneurs*, 2017(27):176-177.
11. Gao D Y. From ideological and political courses to ideological and political courses: Constructing a curriculum system for ideological and political education in colleges and universities from a strategic perspective [J]. *China Higher Education*, 2017(01):43-46.
12. Zhang H H. Research on China's new energy development[D]. Jilin University, 2014.

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