

Research on the Implementation Path of Curriculum Ideological and Political Education Instructional Design of Automobile Repair Professional Courses

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Abstract: In order to realize the organic integration of professional courses and curriculum ideological and political education, and realize the whole process and all-round education, this paper takes the course of automobile engine construction and repair as an example, and puts forward the ideological and political system of professional courses based on individual-position-success. This paper first analyzes the necessity and advantages of implementing ideological and political education in this course. Then, based on the characteristics of the knowledge content of this course, it focuses on the three knowledge sections of engine theoretical knowledge, disassembly and assembly practice and fault maintenance, and excavates the ideological and political elements of personal quality and patriotism, professional ethics and integrity, and Marxist methodology, so as to make the ideological and political elements seamlessly fit with the professional knowledge points, and at the same time realize the all-round cultivation of students. Finally, the quality of curriculum ideological and political education is ensured by strengthening the teacher team, optimizing the teaching design and establishing the practical path of the assessment mechanism.

Keywords: Professional courses; Curriculum ideological and political; Teaching design.

1 Introduction

With the continuous development of science and technology, more and more professional types and professional courses have emerged. The large proportion of professional courses and the large proportion of time for learning professional courses also lead to the lack of ideological and political education for students, which will have a negative impact on the development of society. At present, many schools have added ideological and political education to their professional courses^[1]. Fiona Russo presents a synthesis of extant research from the past 15 years about PRME and barriers to implementation in Business Schools^[2]. The literature demonstrates positive impacts on students' prosocial behaviours, attitudes, and beliefs when PRME is embedded in tertiary business curriculum^[3]. Kenneth Nordgren discussed the conditions of the course of human cultural history, and believed that history teaching can make a historical gaze on this dilemma of human culture and guide students to challenge the traditional epistemology of the subject^[4]. Geng deeply explores the ideological and political elements contained in the course of communication principle, and puts forward requirements for the teaching staff and evaluation system^[5]. Liu analyzed the teaching

objectives of the course and the ideological and political objectives of the course, explored the ideological and political elements of the "database technology and application" course, and realized the ideological and political education of the students of this major^[6]. Based on "Automobile Engine Construction and Repair" course, this paper deeply explores the ideological and political resources contained in the course from three parts : theory, practice and combination of theory and practice, transforms professional knowledge into an effective carrier of concretization and vividness of socialist core values, and combines teaching team construction, teaching methods and assessment methods to combine imparting knowledge with value guidance, so as to implement the fundamental task of establishing morality and cultivating people.

2 Analysis of course characteristics

2.1 Characteristics of course content

"Automobile Engine Construction and Repair" is a compulsory course for automobile repair major. The nature of the course proves the necessity of ideological and political education. The course structure is divided into two parts : construction and repair. At the same time, each part includes two classes : theoretical teaching and practical operation. There are 68 hours in the construction part, 28 theoretical hours, 40 practical hours, and 42 hours in the repair part. The theoretical and practical hours are 6 and 36 hours respectively.

2.2 Characteristics of course content

First of all, from the perspective of course content, this course includes the basic theoretical knowledge of the engine, the disassembly and assembly practice of the engine, the diagnosis and repair of the engine fault, and runs through the three aspects of 'what is it', 'why' and 'how to do'. It has a complete system from learning to using, which is conducive to the implementation of ideological and political education in all aspects. Secondly, there are many hours in this course, and the teaching time is relatively concentrated. Teachers and students spend a long time together, which is conducive to teachers' accurate grasp of students' ideological trends, so that they can make correct value guidance from the perspective of students. Finally, the cases and examples encountered in the learning process of this course are related automobile phenomena that are often seen in students' life. The implementation of curriculum ideological and political education from these aspects as an entry point is more helpful for students to understand the relationship between theoretical knowledge and ideological and political elements, so as to make it easier for ideological and political education to moisten things silently.

3 Design of curriculum ideological and political system

The main content of this course includes three parts: engine theoretical knowledge, engine disassembly practice and engine fault maintenance. As shown in Figure.1, according to the content characteristics of each section, this paper deeply explores the ideological and political elements in three aspects: personal quality and patriotism, professional ethics and ethics, and Marxist methodology, so that the ideological and political elements can be seamlessly

integrated with professional knowledge points, so that the ideological and political education can be integrated into the curriculum silently. At the same time, the progressive ideological and political content realizes the all-round cultivation of individual-position-success, and truly unifies knowledge transfer and moral education.

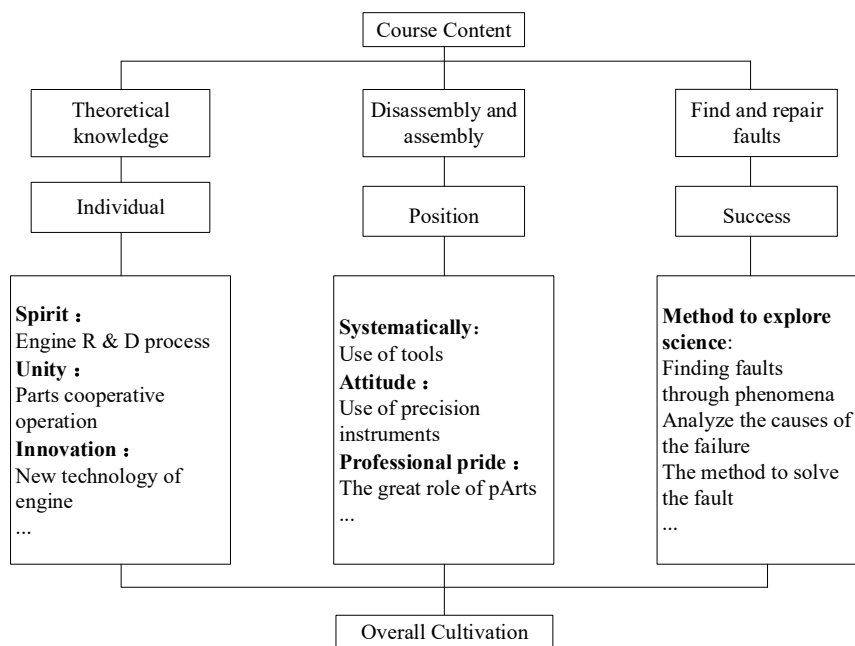


Fig. 1. Design of curriculum ideological and political system.

3.1 Integrate personal quality and family feelings into the theoretical knowledge of the engine

The basic structure of the engine is the theoretical basis of this course, including the working principle and basic composition of the engine, which contains a large number of ideological and political elements about personal quality and national feelings. The ingenious combination of theoretical knowledge and personal qualities and feelings of home and country can make students have a strong interest in the first professional field, thus forming the motivation of learning internally, and can also cultivate students' excellent personal qualities and strong patriotic feelings invisibly.

The change process of the engine contains rich spiritual qualities. By introducing the technical development of the early steam engine to the modern electronically controlled engine, students can understand the status of China's engine research and development in the world. At the same time, combined with the difficulties faced by China's engine research and development process, students can understand the self-reliance of the Chinese Communists in the face of difficulties. In addition, by enumerating the outstanding scientists emerging in the history of China's automobile development, students can experience the great contribution made by the

older generation of automobiles to scientific progress and the development of the motherland, thus stimulating students' determination to devote themselves to the automobile industry.

The components and principles of the engine contain rich philosophy of life. Each part of the two major institutions and the five major systems has its unique function. The stable operation of the engine requires each part to complete its own tasks and the coordinated operation between the parts. Through these, students can understand the relationship between people and society. The stability and prosperity of society require everyone to do their own work well. They can also make students understand that there is no distinction between noble and humble positions, and increase students' sense of identity for their professional skills and employment positions.

Engine technology change and optimization show the value of technological innovation. The injectors of gasoline engines have evolved from various carburetors in the early days to single-point electric injection, multi-point electric injection, and now direct injection in the cylinder. Each technical update is the crystallization of technology and innovation. Through the development of the industry and society caused by the iterative update of technology and parts, students can understand that innovation is the first driving force for development, so as to stimulate students' innovative spirit in the industry.

3.2 Incorporating professional ethics and ethics into the practice of engine disassembly and assembly

The practice of engine disassembly and assembly requires students to disassemble and assemble the engine, which is the first step for students to take to the actual post. Therefore, combining the practice of disassembly and assembly with professional ethics and ethics, cultivating students' work style and professional outlook from the source is conducive to the healthy growth of students in the automobile industry.

Engine disassembly is a very complex process, which requires a variety of special tools and general tools, and a large number of parts are also facing the problem of placement. Therefore, students often encounter problems such as unable to find tools and unable to put down parts. In view of this kind of problem, through the appropriate guidance of teachers, let students develop a work style such as use up and reasonable placement, and lay a solid foundation for disassembly and assembly practice and future career development.

In order to make students have a deeper impression, teachers will explain some of the parts removed during the disassembly and assembly process, such as the measurement of the 'three clearances' of the piston ring and the measurement of cylinder wear. Some accurate measuring instruments such as micrometers and cylinder meters are used. At this time, students can develop a scientific and rigorous work attitude through appropriate cases and guide students to be meticulous in the engineering field.

For parts with complex shapes and high manufacturing difficulties, such as the cylinder body cast as a whole, its shape is equipped with various combination and installation features, and the water jacket for cooling water flow is also arranged inside. It can properly explain the manufacturing process of this kind of parts, improve the students' attention to the current research objects, and stimulate the students' sense of identity to the industry and the pride of becoming a great power craftsman.

3.3 Incorporating Marxist methodology into engine fault maintenance

Engine fault maintenance is a process in which students use the content mastered in the previous course to solve the actual engine faults, and use the knowledge they have learned to solve practical problems. Combining Marxist methodology with engine fault maintenance is conducive to improving students' ability to analyze causes and solve faults. At the same time, it enables students to develop the habit of using scientific methodology to solve any problems, and truly teach them to fish. The real realization of giving to fish is not as good as giving to fishing.

Common engine faults are small faults that are difficult to detect directly. These faults are usually found by observing the driving state of the car. For example, the exhaust gas of a normal car should be a colorless gas. If the exhaust gas is white or black, it does not mean that there is a problem in the exhaust system. It may be caused by poor combustion in the engine cylinder. In view of this situation, the content of the methodology on seeing the essence through the phenomenon has made a good interpretation.

There are many reasons for some faults in the engine, such as the insufficient combustion of diesel in the cylinder, which may be the lag of fuel supply advance angle, or the insufficient intake, or the poor quality of diesel. At this time, a variety of reasons for insufficient combustion can be combined with multiple causes in methodology. At the same time, it can also be combined with a chain reaction caused by a fault. For example, when the combustion is not sufficient, the exhaust gas is black and accompanied by pollutants, and carbon deposition will be generated at the valve, affecting the efficiency of the engine. Through these, students can cultivate the ability to consider the overall situation when encountering problems. In the future fault maintenance, they should not only solve the urgent task, but also consider the possible faults in the future, and eliminate the potential safety hazards in the future.

In the actual operation process of fault maintenance, some students will have similar ideas such as 'have mastered the steps of repair', 'just screw a wrench' and so on. In the process of practice, they only look at other students' operation, and they do not carry out actual operation, which is a typical phenomenon out of practice. In the classroom, every student can operate by improving the teaching method, so that students can not only consolidate their professional knowledge, but also truly transform what they have learned into use, and can experience the truth of practice invisibly, so as to be more pragmatic in their future life and work.

4 The practical path of curriculum ideological and political education

The ideological and political education of the curriculum should take students as the main body and teachers as guides to inspire students to understand the value connotation in the curriculum. Automobile engine construction and repair is a professional and technical course. In the past, the teaching process was biased towards the teaching of theory and technology, and the consideration of moral education was lacking. Therefore, the ideological and political education of professional courses needs to be explored from all aspects of teachers themselves, teaching design and teaching evaluation to ensure that the ideological and political education of courses can be effective.

4.1 High-quality teacher team helps to realize curriculum ideological and political education

Teachers are the first responsible person in the classroom and an important part of the implementation of ideological and political education in professional courses. Teachers' understanding of ideological and political education in professional courses, their own ideological and political theory level and their enthusiasm for implementing ideological and political education in courses are crucial to the construction of ideological and political education in courses.

Improve the professional teachers' understanding of the ideological and political functions of professional courses. Teachers of professional courses often think that the teaching goal of professional courses should be to impart students' professional knowledge as much as possible, ignoring the guidance of students' ideological value, and failing to realize the essence of 'educating people' in teaching and educating people. Professional teachers are not only the guide for students to explore professional knowledge, but also the guide for students to lead the value. Taking engine repair as an example, being able to diagnose engine faults and propose solutions to problems can only enable students to master a skill, and at the same time, leading students to correct values and professional views can promote students' further development on the career path.

Improve the ideological and political theory level of professional teachers. Most professional teachers are proficient in the professional knowledge of their field, and the research on the related aspects of ideological and political theory is insufficient, which leads to the phenomenon of "two skins" in the classroom and ideological and political education, which greatly reduces the effect of curriculum ideological and political education. Therefore, improving the ideological and political level of professional teachers, such as carrying out ideological and political theory learning to deepen teachers' exploration of ideological and political resources in the content of professional courses, carrying out ideological and political demonstration courses to enrich the integration of ideological and political and professional knowledge, can make the classroom and ideological and political can be better integrated to achieve the effect of 'salt dissolved in water'.

Improve the management mechanism of integrating curriculum ideological and political education into teacher performance appraisal. Scientific and reasonable curriculum ideological and political performance appraisal and incentive mechanism can effectively improve the enthusiasm of teachers to implement curriculum ideological and political education to a certain extent, and is a powerful starting point for the implementation of curriculum ideological and political education in professional courses. For example, the Tianjin Municipal Education Commission require colleges and universities in Tianjin to include the construction of "curriculum ideological and political" in the key work of the school, link the relevant work of teachers' curriculum ideological and political work with teachers' year-end assessment, title promotion and salary treatment, and set up a special incentive mechanism for curriculum ideological and political work, which has vigorously promoted the construction of curriculum ideological and political work. Integrating curriculum ideological and political education into teacher performance appraisal can effectively improve the input energy of the majority of teaching staff in ideological and political education, and comprehensively promote the high-quality development of ideological and political education in professional courses.

4.2 Excellent teaching design improves the ideological and political effect of the course

Teaching design is the main way to realize the teaching goal, and also the main way to realize the ideological and political goal. Excellent teaching design can make the teaching process vivid, and also enable students to understand the intrinsic value while learning professional knowledge. According to the teaching characteristics of the three major sections of this course, the teaching methods of summarizing sublimation, group research and case traction can be used to realize the integration of specialty and ideological and political education.

Summary sublimation. While summarizing a certain knowledge point, the teacher sublimates this part of the content to the corresponding ideological and political goals. There are many knowledge points in the basic structure of the engine, which is prone to the dilemma of boring classroom and difficult implementation of curriculum ideological and political education. The method of summarizing and sublimating can solve the problem well. Taking the engine cooling system as an example, this paper summarizes the functions of thermostats, water jackets, pumps, radiators, fans and other components, discusses the adverse effects on the engine after the absence of one of them, and then extends to the relationship between individuals and society. In this way, students can not only have a deeper understanding of the cooling system, but also understand that there is no difference between positions, and the stable development of society requires the coordinated development of all walks of life.

Group study. Organize teaching and discussion in the form of groups to cultivate students' sense of teamwork and responsibility. In the practice of engine disassembly and assembly, the group research method is adopted, and the group leader, safety officer and equipment manager are arranged in the group. Because everyone has a specific task, so the completion of disassembly practice requires each student to shoulder their own responsibilities, invisibly cultivate students' sense of responsibility. At the same time, under the supervision of security officers and equipment managers, students gradually develop good professional habits such as classified placement, replacement after use, and standardized use of tools in the course. This way not only increases the participation of students in practice, but also develops the awareness of teamwork and good professional norms during disassembly and assembly.

Case traction. The actual cases are introduced into the course, and analyzed from different angles, so as to reasonably implement the ideological and political education of the course. Case traction teaching method can be used for engine fault maintenance related content. The fault case traction is divided into four steps : finding fault, analyzing fault, solving fault and summarizing experience. Teachers can realize the goal of educating people from four aspects combined with professional knowledge and methodology, values and other ideological and political content. For example, it is found that the fault ' the automobile exhaust is black ', which is because the gasoline in the cylinder is not fully burned, and it is not the problem of the exhaust pipe. At this time, it can guide students to understand that doing things through the phenomenon to see the essence. The reasons for the insufficient combustion of gasoline include various reasons such as air intake blockage, small fuel supply advance angle, and poor gasoline quality. At this time, students' logical thinking is cultivated through the process of analysis. In the hands-on repair, the phenomenon of some high eyes and low hands is appropriately reminded, so that students understand that practice is the only criterion for testing truth. Finally, the experience of fault maintenance is summarized, and the corresponding improvement scheme can be put forward from the three stages of design,

maintenance and repair, so as to cultivate students' systematic thinking and innovative consciousness.

4.3 The assessment feedback mechanism optimizes the ideological and political construction of the course

The results of the course assessment reflect the students' course learning effect. In the past, the course assessment paid too much attention to the acquisition of professional knowledge, which was not conducive to promoting the improvement of students' conduct and literacy. Through scientific and effective curriculum assessment, students' values, outlook on life and world outlook can be understood, and then the students' thoughts can be checked and filled, and the ideological and political content of the curriculum can be designed in a targeted manner, so as to better realize the educational purpose of curriculum ideological and political education. According to the characteristics of the course content, the course adopts three ways to observe students' value orientation.

Questionnaire survey. Questionnaire survey is the most intuitive way to reflect, can directly get the students' harvest. Through a questionnaire survey of nearly 75 people in the two classes in the spring of 2023, the results show the following table. It can be seen from Table 1 that most students think that the study of this course has a great influence on values, work style, innovative thinking and logical thinking.

Table 1. Questionnaire feedback.

	Great impact	General impact	No impact
Values	70	5	0
Work style	71	4	0
Innovative thinking	69	6	0
Logical thinking	70	5	1

Increase the scoring items. The professional ethics and integrity paid attention to in the practice of disassembly and assembly can be investigated by adding corresponding scoring items, and the scoring results account for a certain proportion of the results of disassembly and assembly practice. For example, in the process of disassembly and assembly practice, the placement of parts, the use of disassembly tools, the progress of disassembly and assembly, etc. of each group are scored, and the scoring results are used as part of the usual performance, so as to supervise and examine the cultivation of students in professional ethics.

Write your thoughts and feelings. Feelings can reflect the students' reception in the learning process of this course from the heart. From the 75 insights received, it was found that 13 people spoke about their gains in curriculum learning from the aspects of personal qualities and national feelings; there are 45 people from the professional norms, professional ethics about their future to be based on the post, the construction of the motherland; 17 people said that they understood the application of methodology in philosophical thought in course learning. From the results, a small number of students in the 'individual' and 'success' stage, most of the students have reached the 'position' stage, in line with the normal distribution of student achievement. At the same time, it shows that in the follow-up teaching design, the

application of methodology can be appropriately improved to promote more students to develop into talents.

5 Conclusions

The ideological and political construction of automobile engine construction and repair course is not simply to instill ideological and political knowledge in the classroom, but to deeply explore the ideological and political elements contained in the professional knowledge according to the content and characteristics of the course, design the teaching methods and evaluation system suitable for this course, and at the same time enhance the ideological and political awareness of teachers, so as to realize the combination of professional knowledge and value guidance, and implement the fundamental task of establishing morality and cultivating people in schools.

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