



A Research on Automobile Theory Course Teaching in the Perspective of Curriculum Ideology and Politics

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Abstract. In the curriculum system of vehicle engineering, the course of automobile theory is a compulsory and professional course. Integrating ideological and political education into the teaching process of professional courses is of great significance in achieving collaborative education and moral education. In response to the common problems of insufficient materials of ideological and political elements and unnatural integration with professional knowledge in the current ideological and political construction of automobile theory courses, this paper explores the integration method of automobile theory courses and ideological and political elements. Taking the theme of ideological and political elements "craftsman spirit" as an example, a practical plan for ideological and political education is designed around the main knowledge of automobile theory courses. Practice has proven that integrating the ideological and political element of "craftsmanship spirit" into the teaching of automobile theory courses has stimulated students' interest in learning and to some extent improved their professional knowledge level and ideological and political quality.

Keywords: Automobile theory; Ideological and political elements; Craftsman spirit; Curriculum ideology and politics.

1 Introduction

Learning is not just about accumulating information, but about rebuilding one's world [1]. The scientific curriculum ideology and politics extends the breadth of professional knowledge coverage, while highlighting the depth of its ideological and political education content [2]. Professional education courses should reasonably expand the breadth, depth, and temperature of professional courses [3], and it is extremely urgent to strengthen ideological and political education in teaching [4]. With the advancement of ideological and political education reform in the curriculum, colleges and universities have taken professional courses as an important carrier [5].

However, there is a certain degree of difficulty in integrating ideological and political education with professional knowledge in engineering courses [6]. The automobile theory course involves a series of complex formula derivation and force analysis, which is highly theoretical and abstract. The problem of integrating ideological and political

education with professional knowledge is obvious. How to effectively carry out ideological and political education while teaching speculative knowledge, and achieve the goal of cultivating morality and talent, is a thought-provoking question. Therefore, this article aims to analyze the current problems in the ideological and political construction of automobile theory courses, and to explore teaching practice methods that organically integrate professional course education with curriculum ideology and politics.

2 Problems in Curriculum Ideology and Politics Construction

Students majoring in automotive engineering generally need to study automobile theory course, which is a professional basic course. There are many formulas with complex derivation, which makes it difficult for students to learn. The cognition is obscure, boring and difficult to understand [7].

In the actual teaching of curriculum ideology and politics, the main problem lies in how to fully explore the ideological and political elements contained in the courses and reasonably integrate them with professional knowledge. A common situation is that the integration of ideological and political elements with professional knowledge is not natural, resulting in a significant reduction in teaching effectiveness. If we forcefully add ideological and political elements just for the sake of it, it may cause students to feel abrupt and resist [8].

3 The ideological and political education practice of automobile theory course

The education of professional courses requires teachers to cultivate students' correct worldview, outlook on life, and values while enhancing their professional skills [9]. Craftsman spirit refers to the attitude of constantly striving for perfection from product manufacturers, which is specifically manifested in their rigorousness, professionalism, dedication, and innovation [10]. At present, many universities in China regard cultivating the "craftsmanship spirit" of engineering students as one of the important goals of curriculum ideology and politics. Therefore, this article takes the ideological and political element "craftsman spirit" as the theme and integrates the ideological and political element into the professional knowledge of the automobile theory course based on the training objectives and teaching program, to achieve an organic integration. The main integration points are shown in sections 3.1 to 3.7.

3.1 Power Performance of Automobiles

In the process of teaching the power performance of electric vehicles, by analyzing the development of new energy vehicle technology in China, and the world leading position of Chinese automobile enterprises in certain fields, it is emphasized that only by

continuous pragmatic innovation and promoting China's technological progress can we break the "stranglehold" dilemma [11], aiming to cultivate students' craftsman spirit.

3.2 Fuel Economy of Automobiles

Compared to traditional fuel vehicles, new energy vehicles have significant advantages in reducing exhaust emissions and air pollution. China sold over 2 million new energy vehicles in 2022, which is closely related to China's breakthrough in the field of electric vehicle battery technology. The passion for work and the pursuit of excellence among researchers have enabled China to take the lead internationally in graphene batteries, lithium-sulfur batteries, and solid-state batteries, while also ensuring the high quality and safety of battery products.

3.3 Selection of Parameters for Automotive Power Plant

When teaching the selection of gear numbers and ratios in the transmission system, the difficult development history of China's automatic transmission is introduced. Previously, core technologies were monopolized by major companies such as Aisin, ZF, and BorgWarner. Nowadays, more and more Chinese automotive brands are focusing on original design and forward research and development to achieve independent research and production of automatic transmissions. This allows students to understand that it is due to the hard work of automotive engineer generation by generation that China's independent brand has developed and progressed. This cultivates students' craftsman spirit.

3.4 Braking Performance of Automobiles

When explaining the concept of braking distance, by analyzing the relationship curve of brake pedal force, braking deceleration, and braking time during the braking process of a vehicle, from the moment the driver receives an emergency stop message to reaction, to the braking of the brake, with the braking time precisely divided into 0.1 seconds, this process rigorously divides the four stages of the braking process [12]. This inspires students to have a meticulous and serious craftsman spirit in engineering practice.

3.5 Vehicle Handling and Stability

Emphasis will be placed on introducing tangential reaction force control of vehicle curve motion. By explaining the basic principles and various innovative electronic control systems developed by various automotive companies and component suppliers to improve vehicle handling stability, such as Traction Control System (TCS), Direct Yaw Moment Control System (DYCS), etc., students are aware that only by striving for perfection, pursuing excellence, and constantly innovating can we develop good products. This cultivates the craftsman spirit among students.

3.6 Smoothness of Automobiles

In explaining the human body's response to vibration, it is introduced that many long-distance commercial vehicles, due to the insufficient shock absorption performance of the seats, cause drivers to be easily troubled by a series of occupational disease after a long time of driving. Therefore, automotive designers need to focus on improving the smoothness of cars and rigorously optimize their parameters to ensure excellent smoothness [13], thereby alleviating the occupational disease of drivers. This cultivates students' craftsman spirit of striving for excellence.

3.7 Passing Ability of Automobiles

When explaining this part of content, we will introduce China's independently innovated high passing ability Dongfeng Motor's Mengshi military off-road vehicle, which has reached the international leading level in performance. It has obtained more than 20 authorized patents and won the first prize of National Science and Technology Progress Award. The excellent performance of this military vehicle cannot be achieved without the researcher's hard work and dedication day and night. This sets a good example of the craftsman spirit for students.

4 Practical Application of Course Teaching

Assessment should pervade the learning process [14]. In the first semester of the 2022-2023 academic year, the course team integrated the above ideological and political education practice plan into the teaching process, cultivating students' excellent qualities. Through feedback on students' classroom performance and course assessments, it was observed that students' seriousness in completing homework generally increased, and their enthusiasm for participating in innovation and entrepreneurship projects for college students also increased. In the 2021-2022 academic year, the proportion of students with a comprehensive score below 60 in this course reached 19.4%. Compared to students of different grades in the same major, the proportion of students with a comprehensive score below 60 in the 2022-2023 academic year is 6.2%. This indicates that the teaching effect has been significantly improved, and the proportion of students with a comprehensive score below 60 has significantly decreased by 13.2%. This has stimulated students' interest in learning, and to a certain extent, improved their professional knowledge level and ideological and political quality.

5 Conclusions

Due to the particularity of the automobile theory course, there are generally problems in the current curriculum ideology and politics construction, such as insufficient exploitation of ideological and political elements and unnatural integration with professional knowledge. The organic integration of ideological and political education with course content is an important and arduous task that requires continuous promotion by

teachers. This article discusses the main issues existing in the current curriculum ideology and politics construction of automobile theory course. Based on the training objectives and teaching syllabus, and combined with the contents of each chapter, it elaborates on the practical plan of integrating the ideological and political element "craftsman spirit" into the teaching of automobile theory course. This plan has been applied in the classroom teaching in the 2022-2023 academic year and has achieved good educational effects. The aim is to explore practical ways of curriculum ideology and politics construction of automobile theory course.

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