

## *Original Paper*

# Teaching Reform and Practice of Ideological and Political Education in the Course of Automotive Engine Principles

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Received: January 24, 2024

Accepted: May 07, 2024

Online Published: May 25, 2024

doi:10.22158/wjer.v11n3p44

URL: <http://dx.doi.org/10.22158/wjer.v11n3p44>

### ***Abstract***

*The course of automobile engine principle is the foundation of vehicle professional learning. The professional knowledge and innovative value contained in the course is an effective carrier to realize moral education. This paper puts forward the implementation plan of "one center and two main lines", which is centered on promoting morality and cultivating people. Four modules, "Engine performance and cycle", "Engine ventilation", "engine fuel and combustion", "Engine characteristics and car matching", are taken as the main line of knowledge teaching. "socialist core values, feelings for the family and the country, craftsman spirit, innovative thinking" as the main line of ideological and political education. At the same time, based on the network teaching platform, the whole process of before-class, in-class and after-class teaching is realized.*

### ***Keywords***

*automobile engine principle, professional education, ideological and political education, teaching reform*

## **1. Teaching Status of Engine Principle Course**

The course of engine principle in the field of vehicle engineering not only applies knowledge from previous courses such as automobile structure and engineering thermodynamics, but also serves as the foundation for subsequent courses in automobile theory and vehicle design. However, this course is known to be quite challenging. Currently, traditional teaching methods dominate the classroom, with low utilization of information-based teaching tools and limited diversity in evaluation methods. The emphasis on professional education has led to a lack of integration with ideological and political education, resulting in low overall student engagement and teaching effect is not ideal.

## 2. Ideological and Political Reform and Practice of Automobile Engine Principle Course

### 2.1 Optimize the Teaching Content and Collect Ideological and Political Elements

The project team's instructors will restructure the course content and categorize the teaching material into four modules: engine performance and evaluation, engine ventilation, fuel and combustion, and engine characteristics. The knowledge points within each module will be organized and refined, with a focus on aligning the learning objectives, skills development goals, and quality standards with the students' abilities. Furthermore, an exploration of the ideological and political elements embedded in the knowledge points will inform the establishment of corresponding ideological and political objectives. Specific ideological and political materials are detailed in Table 1 to effectively integrate ideological education into teaching activities for both explicit knowledge transmission and implicit moral education.

### 2.2 Trinity Teaching Mode Based on Network Teaching Platform

Change the traditional teaching model, increase the use of information technology in teaching, adopt Rain classroom and other related online teaching platforms, and implement a three-in-one, all-round teaching mode that covers before-class, in-class, and after-class activities to make up for the shortage of class hours, break the traditional teaching limitations on time and space, and improve the flexibility of teaching and learning.

**Table 1. Engine Principle Teaching Content and Ideological and Political Materials**

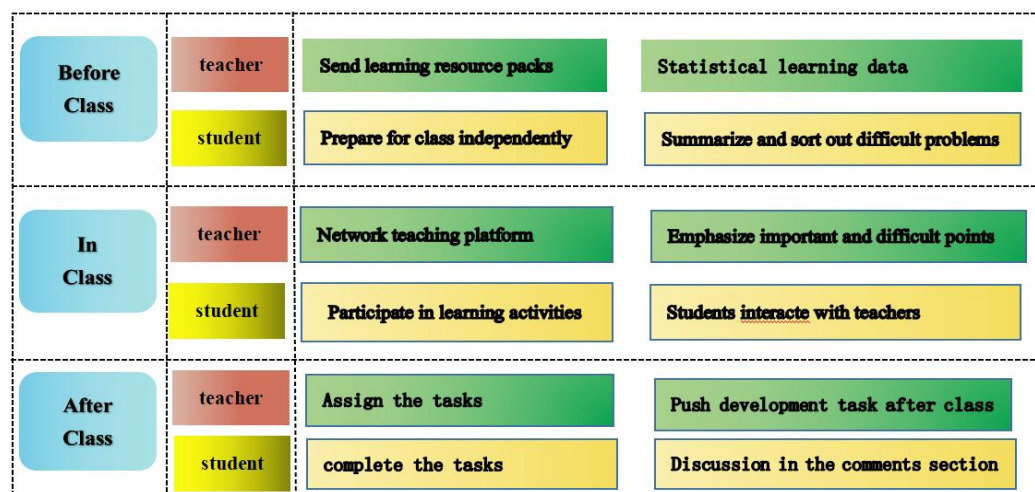
Chapter content	Knowledge target	Ideological and political material	Ideological and political education goal
Engine performance	Engine performance indicators	The rise of national brands, the spirit of persistent innovation	Cultivate students' innovative thinking, pursuit of excellence craftsman spirit and professional quality
emissions of engines	Methods to improve inflation efficiency	the core technology is firmly in our own hands, breaking foreign monopolies and establishing our own brands	Cultivate students' scientific research spirit
Engine combustion	The combustion process of an engine	A spark is small but powerful	Give full play to students' strengths, tap students' potential, integrate with enterprises
Characteristics of an engine	Engine load characteristic curve	the road of life, winding, perseverance, reach the peak	Cultivate students' indomitable spirit, positive and optimistic attitude

Before class, teachers use the Rain Classroom network teaching platform to publish the course teaching objectives, syllabus and online learning materials, such as: Teaching courseware, teaching videos, online tests, etc., students log in to the Rain classroom class to complete the preview task and self-test. For students, they can independently and flexibly arrange their learning plans. Through the test, they can find their own shortcomings and enter the class with problems, improving students' participation, self-study ability and learning enthusiasm.

In class, the teacher mainly provides answers to questions, case analysis, and communication and discussion to give students as much thinking space and expression opportunities as possible. Real-time communication is achieved between teachers and students, as well as among students. In case analysis,

appropriate elements of ideological and political education, such as craftsman spirit and innovative breakthroughs, are integrated to enable students to learn theory while loving their major and understanding their major better.

After class, practice and development, teachers still use the rain classroom network teaching platform to assign tasks. In order to meet the learning requirements of students at different levels, homework is set to be done and optional to do two types, such as: test type and report type homework, which can reflect students' knowledge mastery degree, and learning effect as homework; Apply professional knowledge to solve practical problems, such as analyzing and evaluating engine performance, as optional assignments.



**Figure 1. Trinity Teaching Mode**

### 2.3 Build a Diversified and Comprehensive Assessment System

At present, the examination results of the course of Automotive engine Principles are composed of the weighted sum of the final examination results and the usual results. However, due to the lack of assessment on students' learning attitude, innovative thinking and practical ability, the traditional one-volume assessment model is abandoned, and curriculum ideological and political assessment and subject assessment are added to the curriculum assessment system to establish a diversified, comprehensive and comprehensive evaluation system, which improves students' participation in the whole learning process. Improve the ability of innovation and practice and establish a correct view of employment and professional quality, the assessment system not only reflects the learning effect of students, but also reflects the effect of ideological and political education, and realizes the combination of process assessment and result assessment. In the curriculum assessment system.

### 3. Conclusion

It takes ten years to grow trees and a hundred years to cultivate people. Colleges and universities are not only the cradle of training professional talents, but also cultivate high-quality compound talents with correct values and ideals. With moral cultivation as the fundamental task, the professional education and ideological and political education in the course of automobile engine principles are organically integrated to help students build a solid professional foundation while establishing a correct outlook on life and values, practicing socialist core values, and promoting the artisan spirit of love, dedication, hard work and innovation. In today's rapid development of information technology, teaching methods should also conform to the law of physical and mental development of college students, the classroom should break the teacher's "one-man show" cramming teaching, make full use of information teaching methods, student-oriented, teacher-led, stimulate students' enthusiasm for learning, let students participate in the whole teaching process, and ultimately cultivate high-quality, application-oriented talents that meet the requirements of society.

### Acknowledgments

Ideological and Political teaching reform project of Tarim University, Project Number: TDKCSZ22318.

### References

- Chen, S. L. (2021). The way to realize the cooperative education of natural science courses and ideological and political theory courses in universities. *Journal of Chengdu University of Technology(Social Sciences)*, 1, 97-103.
- Geng, Z. (n.d.). Teaching thinking of "Aircraft hydraulic transmission and control" combined with ideological and political education. *Education and teaching forum*, 34, 180-130.
- Guo, L. (2023). Reform and exploration of ideological and political teaching of automobile engine principle course. *Laboratory science*, 2, 222-225.
- Peng, C. W. (2021). The exploration and practice of integrated curriculum ideology and politics in the hybrid teaching mode of "Engine Principle". *China Southern Agricultural Machinery*, 4, 174-179.
- Ren, S. T. (2023). The teaching research of "Automobile Construction" course combined with ideological and political education. *Special purpose vehicle*, 12, 128-130.