

Strategies for Project-oriented Teaching Design of Automobile Inspection and Maintenance Course

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Abstract: Automobile Inspection and Maintenance Course is relatively practical and professional. Therefore, teachers need to provide students with opportunities for practice as much as possible, so that students can realize the integration of theory and practice, improve teaching efficiency. Project-oriented teaching design can enable students to participate in the practical training and maintenance of automotive engines, which helps students understand the theories in the book. This article mainly analyzes the strategies for teaching design of project-oriented Automobile Inspection and Maintenance Course.

Keywords: Automobile Inspection and Maintenance Course; Project-oriented teaching; Designing strategies

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1 Introduction

Automobile Inspection and Maintenance Course is the core course in the major of vehicle operation engineering, in which the basic knowledge and skills are integrated. It requires students to be able to apply the basic knowledge to practice. And in Automobile Inspection and Maintenance Course, students need to grasp the corresponding processes, new technologies in a timely manner, which requires students to have strong ability of self-learning. If the teacher still uses the traditional explanation and the students just imitate in the teaching process, the student's consciousness of active participation will be greatly lowered. Although a lot of basic knowledge is learned, there are still great difficulties in the actual problem solving process.

Through the introduction of project-oriented teaching methods, students can join in the project planning and actual automobile repairing and maintenance, as well as improving their practical skills.

2 Determine the tasks in the project

2.1 Designing Plans for the Project

Before designing the plans for the project, Automobile Inspection and Maintenance Course can be detailed. For example, different sub-projects such as crank connecting rods, valve structure construction, maintenance of cooling system and engine assembly are set in the engine, being divided into different modules^[1]. For example, the maintenance of the gas distribution mechanism can be divided into modules such as detection of cylinder tightness and adjustment of valve clearance. In each module, several specific skills are specifically taught, and the practical skills are strengthened under the guidance of the theory, so that students can fully grasp the content of the project.

2.2 Develop and improve the goals for the project

After the teacher proposes the task, the students discuss the content and determine the specific goals for implementation. Taking the valve train as an example, the teacher can formulate the goals for the project in accordance with the teaching content: First, discuss the composition, role, and operating requirements for the valve train; clarify the positioning and adjustment of the camshaft; understand the structure of the valve assembly, role and relationship^[2]. Then determine the specific implementing tasks, including the correct description of the structure of the valve, valve seat, duct, etc.; master the phase of gas distribution and

operating principle; understand the technical changes and maintenance of the gas distribution mechanism, master the corresponding maintenance methods; be able to accurately judge the abnormal sound in the gas distribution mechanism, tell the cause of the abnormal sound and diagnosis; cultivate good habits of maintenance^[3].

3 Make a plan for the project

The teaching for the project needs to focus on the design of the plan. After the project is determined, the teacher needs to guide the students to collect and organize the project-related information in according with the goals and tasks, teachers, equipment, and students' learning level. And like the formulation of the project plan, the project's specific operating steps, technical standards, operating rules, required tools, etc. are summarized. And students are grouped. Generally, the number of each group is about five. Members in the group can learn from each other by communicating with each other, and strictly follow the steps and procedures to determine what to do first and later, skills, and learning goals. It is clear about what to be done first, then what should be done in the implementation of the project, and if it is operated, it will be finally evaluated by the teacher^[4]. In this process, the mode of group cooperation can be used to undergo discussions and project implementation in group learning under the leader' guidance. The group leader needs to divide the labour among the members in the organization, and requires each member to perform his or her duties. For example, for the maintenance of the gas distribution mechanism, teachers can provide an engine for each group, discuss the composition of the gas distribution mechanism by observing, and understand the structural characteristics of the gas distribution mechanism^[5]. In this process, students will come up with a lot of questions. Teachers cannot directly answer them. Instead, they should guide students to analyze the problems themselves, encourage students to think positively, and provide guidance to students by asking questions and commenting. It is necessary to pay attention to the students' understanding of the knowledge and help the students strengthen their confidence in learning.

4 Emphasize teachers' demonstration

In the teaching activities, teachers need to focus on the current knowledge to teach and choose teaching items reasonably. After the project demonstration is

completed, the project implementing steps must be explained. For example, teachers can demonstrate how to inspect the valve clearance for students. Through the teacher's demonstration, students can memorize methods of inspecting the valve clearance and procedures faster and better, and at the same time have a clearer and more complete understanding of the valve distribution mechanism.

5 Implement the plans for the project

In project-oriented teaching, the implementation of the project is an important part in the whole teaching. In this part, both teachers and students need to pay more attention to observing carefully, be diligent in doing and thinking, but also focus on the safety in the operation. Students can combine the contents of the project plans, complete the them through various methods and channels, provide students with greater operating room, and reflect the student's status^[6]. In teaching, teachers must guide students to think independently and complete maintenance as much as possible. Teachers need to encourage students to cooperate, improve their awareness of being in a team, and enable students to better understand and master new knowledge in thinking^[7]. In addition, teachers need to actively participate in the implementation of the project to help students solve difficult problems in learning. Teachers must make timely corrections for students' major mistakes in actual operations, help students better solve problems in the technology, and promote the smooth development of the project. For example, in the engine overhaul project of the engine, to make students understand the knowledge more thoroughly, teachers can use simulation teaching and multimedia teaching to demonstrate the work of the valve assembly^[8]. Then guide students to discuss the working principles and processes of the gas distribution mechanism through grouping, and strengthen the understanding of new knowledge under the teachers' guidance, so that students understand the gas distribution mechanism more clearly and more completely. In this part, inspection and maintenance for the parts are the most important part. Therefore, after the explanation is completed, the students need to operate independently to ensure that the students have a complete grasp of the methods for engine maintenance. In addition, students' practical experience can help test their learning effects and adjust the teaching plans^[9].

6 Summarize and evaluate the results of the project

The summary and evaluation in the teaching is a very important teaching part. Through a fair evaluation of the results of the project, it is necessary to improve students' mastery of the knowledge. In project-oriented teaching evaluation, it is necessary to pay attention to the comprehensiveness and process of the evaluation and the practical ability in the evaluation^[10]. The specific evaluated content is as follows. The method of composition evaluation is used to evaluate the team members' ability of cooperation and contribution, mainly including the quality of the project, contribution, compliance with project specifications, and level of defense. Then teachers upload the student's project results and process to the online through videos and netizens' comment. The diversified evaluation can make it more comprehensive and objective.

7 Conclusion

In conclusion, Automobile Inspection and Maintenance Course requires students to improve practical ability, but in the traditional teaching, due to insufficient attention to the students' practical teaching, the students' theoretical knowledge is not enough, and the efficiency of practical learning is relatively low, which is not good for them to adapt to their future jobs, so project-oriented teaching methods can be used in the teaching process to guide students to practice, timely know their shortcomings in practice, strengthen the curriculum teaching, and also help to improve their professional competitiveness in the future.

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