

# The Application Practice of the Project Teaching Method in Specialized Courses of New Energy Vehicle Technology Specialty

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**Abstract:** The project teaching method takes the practical training project as the core, and takes the students' independent thinking, group cooperation inquiry and teacher-student interaction as the main development methods, which fully meets the current teaching reform needs of the new energy vehicle technology specialty. The application practice of project teaching method in the course of new energy vehicle technology specialty is introduced in the paper, which can provide some reference for teaching reform.

**Keywords:** project teaching method ; new energy vehicle technology ; application practice

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## 1. INTRODUCTION

China's new energy automobile industry is in a critical stage of transition from the introduction period to the growth period. It occupies a pivotal position in the global industrial system, it leads and accelerates the global automobile electrification process, and it also undertakes the dual mission of leading the transformation and upgrading and protecting the atmospheric environment. The development of new energy vehicles is the only way for China to move from a big automobile country to a powerful automobile country, it is a strategic measure to cope with climate change and promote green development. Vocational colleges shoulder the historical responsibility of cultivating technical and skilled talents of new energy vehicle technology. In order to meet the needs of the new energy vehicle market for a large number of high-quality technical and skilled talents in new energy vehicle technology, and highlight the characteristics of vocational education, how can teachers improve students' specialized technical level and promote students' comprehensive development in the teaching of in specialized courses, which is also the problem that most teachers of new energy vehicle technology in vocational colleges need to think about and solve. This paper starts from the connotation of project teaching method, the important value and specific application practice of implementing project teaching in new energy automobile technology specialty are introduced in this paper, so as to provide reference for teachers of new energy vehicle technology specialty.

## 2. THE CONNOTATION OF PROJECT TEACHING METHOD

The project teaching method refers that teachers and students jointly design projects and implement project activities in teaching. Taking the new energy vehicle technology specialized courses as an example, the teacher designs a specific project teaching plan according to the course teaching plan, and then assigns tasks according to the six-step method of 'information, planning, decision-making, implementation, inspection and evaluation'. The first step for students is to obtain information and materials related to the project task. Then according to the requirements of the project task, students formulate preliminary and feasible implementation plans by consulting relevant technical materials. The third step for students is to improve the plan under the guidance of teachers. The fourth step for students is to complete the task in

groups according to the formulated implementation plan. The five step is to check the quality of task implementation according to the enterprise quality inspection standards. Finally, the students summarize and reflect according to the requirements of the project task. Under the guidance of teachers, students complete the whole process of the project independently, and master all the contents covered by the teaching plan in this process.

The project teaching method is a student-centered teaching method, which highlights the main position of students, attaches importance to students' learning knowledge and accumulating experience in practice. It can promote students to realize the transformation from want me to learn to I want to learn, thus helping to improve students' subjective initiative, effectively cultivate students' practical ability, problem analysis and problem solving ability, innovation and communication ability, etc. At the same time, students' sense of teamwork is cultivated in group activities.

## 3. THE APPLICATION OF THE PROJECT TEACHING METHOD IN SPECIALIZED COURSES OF NEW ENERGY VEHICLE TECHNOLOGY SPECIALTY

In the following, the practical application of the project teaching method is introduced by taking the "new energy vehicle air conditioning and refrigeration system not working well" in the course "New Energy Vehicle Electronic and Electrical Air Conditioning Comfort Technology" as an example. This course is the core course of the new energy vehicle technology specialty, which is very close to the actual work content before the students' employment practice, and it is also an important stage for students to cultivate their professional and professional ability.

First of all, teachers assign learning tasks. Due to the particularity of the close connection between the new energy vehicle technology specialty and the market, enterprise research and practice should be done when designing specific learning tasks, so as to ensure the practicability of project design. The air conditioning

and refrigeration system is an important electronic control system for new energy vehicles. In the actual work process, the air conditioning and refrigeration system will not work well due to reasons such as season change. In the information link, students need to master the structure and principle of air conditioning and refrigeration system, and they can recognize them on the whole vehicle. For the electronic control system, students also need to master the analysis and drawing of the circuit diagram and the use of measurement tools.

Next, students need to enter the planning and decision-making stage. Each group of students assigns relevant role tasks according to their own advantages and expertise, and then the work plan is prepared according to the division of work through refer the teaching materials prepared by teachers. In this process, students need to complete the review of materials, the disassembly of circuit diagrams, the preparation of measurement tools and diagnostic instruments and equipment. And then the work plan is formulated through group discussion, which needs to be displayed. Last the revision and improvement of the work plan is complete under the guidance of the teacher.

In the implementation process, the students complete the fault diagnosis on the training bench or the vehicle according to the work plan formulated in the early stage, and the team members complete Safety protection work, the measurement and recording of the data according to the division of work. In the process of implementation, the teacher should understand the students' learning situation and solve the difficulties and problems encountered in time.

After completing the task of fault diagnosis, the teacher needs to organize the students to carry out the inspection and evaluation. In the inspection process, self-inspection of the implementation and mutual inspection between the groups are carried out according to the enterprise quality inspection standards. The teacher finally checks the task completion of each group, the participation of members and the standardization of the implementation process, and at the same time insures the safety and reset of the training station. After the inspection, the team members need to share and summarize the experience of the implementation process of this project, and then carry out self-evaluation and mutual evaluation among the team members. Finally, the teacher will comment on the problems existing in the implementation process of the students, and give feasible suggestions to avoid similar problems. In this process, students can realize their own shortcomings and advantages, and they also can see the advantages of others, so as to make up for each other's shortcomings, at the same time teacher can reflect on the project teaching process and sum up experience for the project teaching.

## **4. EFFECT ANALYSIS OF THE PROJECT TEACHING METHOD IMPLEMENTATION**

### **4.1 The Students' Enthusiasm to Learn Has Been Greatly Improved**

The project teaching method emphasizes that students are the teaching center and learning subject, and all teaching activities are carried out around students. Under the project teaching method, the teaching mode has changed from the traditional "teaching before learning "to " learning before teaching ", and the initiative of students' learning subject has been fully mobilized. From the actual teaching effect, the project teaching method has changed the original classroom teaching method of 'teacher lecturing and student listening, which can give students more time for thinking and communication, and the teaching effect is good. Because the knowledge context of project teaching is clear and complete, it is conducive to students' understanding, memory and application of knowledge. Through the implementation of the project, the students ' sense of achievement in learning has been enhanced, the students' enthusiasm to learn has been greatly improved, the degree of students ' actual participation in learning has been improved, and the students' enthusiasm to learn the professional knowledge of new energy vehicles has been enhanced.

### **4.2 The Organic Integration of Theory and Practice Has Been Really Realized**

In the background of the development of science and technology, the automobile industry is changing with each passing day, especially new energy vehicles are becoming more and more popular, limited by the traditional teaching concept, specialized teachers of new energy vehicle technology often focus on theoretical teaching, which results the disconnection between theory and practice in teaching, even the teaching content lags behind the development of the times and the industry and cannot reflect the latest technology of the automobile maintenance industry. Under the project teaching method, on the one hand we should master the theoretical knowledge and build a good professional knowledge system, on the other hand we should carry out practical teaching according to the characteristics of vehicles, so that students can master the professional knowledge of automobiles as a whole, at the same time the era and practicality of teaching have been enhanced, the organic integration of theory and practice has been really realized, and the foundation for the follow-up development of students has been laid.

### **4.3 The Students' Team-work Consciousness Has Been Enhanced**

When using the project teaching method for teaching, teachers should take the learning project as the core, and let students participate in teaching activities in groups. The project-based teaching takes the student team as the main body, and the students cooperate with each other within the group, which helps to cultivate students ' innovative ability and practical ability. Through project teaching, it not only cultivates students' ability to think independently and improves the situation of passive learning in traditional teaching, but also enhances students ' sense of teamwork.

#### 4.4 Teachers' Professional Comprehensive Quality Has Been Improved

The traditional teaching of automobile maintenance specialty has more requirements for teachers' theoretical knowledge explanation ability, but the application of project teaching method puts forward higher requirements for teachers' personal ability and teaching level. Therefore, in order to improve the implementation effect of project teaching method, it is necessary to improve the comprehensive quality of teachers.

#### 5. CONCLUSION

Through the practice of project teaching method in the specialized courses of new energy vehicle technology specialty, specialized course teaching quality of new energy vehicle technology can be effectively improved, the main role of students in the study of specialized courses can be given full play, students' good practical ability of automobile maintenance can be effectively cultivated, the combination of theory and practice in specialized teaching can be promoted, and the teaching reform can be effectively completed, so as to improve the talent training quality, enhance the comprehensive students' employment quality, and provide talent guarantee for promoting the rapid development of the automobile industry.

#### 6. ACKNOWLEDGMENTS

The author is grateful for the reverent help of technical staff and team support provided by Automotive Engineering College, Zibo Polytechnic University.

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