

Application of task-driven method in the teaching of automobile intelligent sensor technology

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Abstract: Higher vocational education is an important component of higher education in our country, is a type of the higher education development, shoulders the mission of cultivating talents for the economic and social construction and development; At the same time, the higher vocational education is also the high-level education in the vocational education system in our country. Driven by the reform of vocational education, teachers' teaching concepts and teaching methods are constantly improving and innovating, which has injected a steady stream of impetus for the improvement of the quality of vocational education and the development of vocational education reform. In the teaching process of automotive intelligent sensor technology in higher vocational education, the integration of task-driven teaching method can further promote the improvement of the quality of vocational education, so that students can learn more efficiently under the drive of learning tasks, and comprehensively optimize the quality of traditional teaching.

Key words: automobile intelligent sensor technology; Task driven method; Practical teaching

In recent years, with the accelerated development of intelligence, electrification and network connection, cars are changing from a single means of transportation to a third space integrating leisure, entertainment and office functions. When the car enters the era of intelligent network connection, in addition to the necessary traditional sensors, more intelligent sensors are needed as the five features of the car to carry out external environment perception and internal human-computer interaction. The car sensor is equivalent to the five senses and skin of the car, the required information recognition and sensing, according to certain laws into the car control computer (ECU) can receive electrical signals, ECU according to these signals for analysis and processing, control the car's executive components produce the corresponding action.

Automobile intelligent sensor technology is a vocational education course with the training of professional intelligent automobile mechanical and electrical maintenance talents as the educational goal. In order to further improve the effectiveness of automobile intelligent sensor technology teaching, so that students' theoretical knowledge and practical ability have been further improved, teachers should also accept and learn modern teaching theories with The Times in the classroom teaching process, and introduce diversified teaching methods, and effectively play the due role and value of vocational education.

"Task-driven" teaching method is based on the constructivism teaching theory, to both stimulate students' learning motivation, and teaching content closely combined, interesting tasks as the carrier, learners through the completion of a task to acquire knowledge and skills of an open, inquiry-based teaching mode. Different from traditional teaching methods, task-driven teaching method highlights students' initiative and subjectivity in the classroom learning process. It first shows students vocational tasks, and then guides students to carry out profound analysis and discussion on these tasks, so as to show the knowledge points they have learned to other students. Teachers should give full play to the role of classroom guidance, help students find solutions, and finally complete the task.

Teachers organize students to carry out task-driven learning in order to guide students to complete learning tasks together, give them a clear division of responsibilities, specific learning goals, and realize the interaction between students and students, and the interaction between teachers and students.

1. the implementation process

The implementation process of task-driven method in the teaching of automobile intelligent sensor technology is mainly as follows:

1. Before class, the students are freely divided into 4 study groups, and the students discuss and determine the group leaders independently;

2. The teacher will send the relevant learning materials, learning website, project information page and online self-test questions to the students in advance, and the students will preview and study by themselves with reference materials. Through the completion of students' online self-test, the teacher will master the teaching difficulties;

3. Students in the class work in small groups to study and discuss the module content that the group is interested in. Each member undertakes part of the research task and puts forward his/her own views. Respect the speeches of other group members and pay attention to cooperation and communication. Complete related group learning tasks set by teachers, and exercise students' sense of unity and cooperation;

4. After each group has a full discussion and comes up with the best answer, each group will select 1-2 representatives to share the results of the task completion of the group, communicate with other groups, and explain the content of the learning module of the group to improve the students' verbal expression ability.

5. After each group's explanation, the teacher will conduct a spot check on the quality of each group's explanation content: randomly

select members of other groups to check their learning effect on the content.

6. After the presentation of all groups, students will evaluate each other on the overall performance of other groups, and teachers will also evaluate the overall performance of each group, which can be evaluated from the realization of quality goals, knowledge goals and ability goals.

7. All the evaluations will be incorporated into the value-added evaluation system, which will facilitate the evaluation of students' performance at the end of the term. When evaluating students, it is necessary to integrate value-added evaluation, process evaluation and final evaluation. It should be comprehensive and specific, one evaluation for each student; To highlight the value-added evaluation, pay attention to the progress of students; It should focus on process evaluation and comprehensively evaluate students' performance in all aspects.

2. Key points and matters needing attention

1. Key points to be mastered in teaching

(1) The teaching should be student-oriented and teacher-oriented

All teaching activities should be student-oriented and teacher-oriented. Only by facing all students, giving detailed and practical macro-guidance, and implementing all aspects such as careful organization, full preparation, scientific regulation, timely response, rational evaluation, incentive and guidance, can teachers truly cultivate the core literacy and discipline literacy in place and put them into practice.

(2) Teachers should possess excellent professional knowledge and skill level

Although the teacher is the designer of the classroom, the teacher is also the organizer and manager of the classroom, so they should have excellent professional knowledge and skill level. Teachers should be able to prepare sufficient and effective learning materials before class, grasp the important and difficult tasks, and put forward targeted self-tests; They should be able to answer students' questions during discussion at any time in class. Be able to point out problems in the presentations of each group; To be able to timely solve the problems encountered by students in class; To be able to timely supplement the knowledge points left out by students to ensure the completion of teaching tasks.

(3) Teachers should have scientific ability of classroom organization and management

Because task-driven method is different from traditional teaching mode and teaching method, students are no longer confined to the fixed seats and other decorations in the classroom, but should be able to easily change the position for group discussion. How to ensure that the teaching atmosphere is not chaotic and noisy requires teachers to have strong scientific classroom organization and management ability to ensure the promotion of classroom order and teaching process.

2. Matters that should be paid attention to in teaching

(1) Select appropriate project tasks

Not all project tasks are task-driven. If the project is too difficult, it will be difficult for the activity to proceed smoothly. If the project difficulty is too low, it will not improve the participation of students. Typical tasks of intelligent vehicle mechanical and electrical maintenance should be selected, combined with the overall basic level of students, students' learning situation and school facilities and equipment, and typical tasks with moderate difficulty should be selected.

(2) Establish a reasonable evaluation system

Evaluation and reflection are important links to improve teaching methods. In the process of evaluation, students' self-evaluation, group mutual evaluation and teacher evaluation should be adopted. In the process of self-evaluation and group mutual evaluation, students will find their own shortcomings in knowledge and experience, learn and improve in time, form new methods to solve problems, absorb the advantages of others, in order to better improve the group research results. Teacher evaluation can help students better grasp the focus of the problem and have a deeper understanding of the task in this lesson. At the same time, it also encourages students to form a richer way of thinking in the face of task-related problems.

3. The main problems

1. Lack of teaching materials suitable for task-driven method

The intelligent connected car is an emerging product of the development of the automobile industry in the new era, which is equipped with a variety of technologies such as automotive engineering, intelligent control and automatic driving. However, at this stage, there are few professional loose-leaf textbooks that match the new technology, the textbooks that use task-driven method to learn this course are lacking, and the equipment that matches the textbooks is also relatively few.

2. The comprehensive quality and ability of students still need to be strengthened

Task-driven method not only improves students' professional knowledge level, but also effectively exercises students' reading comprehension ability, independent learning ability, language expression ability, unity and cooperation consciousness and public speaking ability. However, students in higher vocational colleges generally lack the opportunity to exercise and show themselves, or lose the opportunity due to lack of self-confidence, so the relevant exercise and show in school is particularly important. This also reflects that the comprehensive quality and ability of vocational college students still need to be strengthened.

4. Case analysis

Taking the project learning of “Visual sensor cognition” in the course of automotive intelligent sensor technology as an example, the implementation process of task-driven method in teaching is analyzed:

1. Before class, students are freely divided into 4 study groups, which are discussed and determined by the students themselves;
2. The teacher will send the learning materials related to the working principle of the vision sensor, the scanning mode and important indicators of the vision sensor, the disassembly method of the vision sensor, the smart vocational education learning website, the project information page, and the online self-test questions in the “Vision Sensor Cognition” to the students in advance, and the students can preview and study by themselves with reference materials, so as to cultivate the students’ autonomous learning ability; Through the completion of students’ online self-test questions, the teacher finds that the difficulty lies in the understanding of the working principle of the vision sensor.
3. Introduction: With the development of machine vision technology, the current vision sensor can provide two functions of driverless car perception and positioning. Among them, the perception function mainly includes obstacle recognition, traffic sign recognition, passable space recognition, traffic light recognition; The positioning function is based on the visual synchronous positioning and mapping technology, which matches the map built in advance with the real-time perception results to obtain the current location of the car. Teacher Question: How do you think the vision sensor (camera) works?
4. The teacher introduces cases and assigns thinking tasks: How to troubleshoot the vision sensor? Assign group tasks: In groups, complete two tasks:
 - (1) Self-study the classification, application and working process of vision sensors, and express the working process on the white board using cardboard;
 - (2) Observe and record the type and model of the intelligent car camera in the training room, and complete the corresponding topics on the working page.

Students should complete two tasks within the specified time, which requires division of labor and cooperation within the group to guide students to strengthen the spirit of unity and cooperation.
5. Students work in groups. Each member undertakes part of the research task and completes the above two tasks together.
6. Each learning group will send two representatives to present their results and share their understanding of the classification, application and working process of vision sensors. The teacher recorded the students’ performance, strengths and weaknesses in the sharing process, and made teacher evaluation.
7. Quality check: The teacher randomly selects one student from each group to answer the questions to test the effect of independent learning.
8. Self-assessment and mutual assessment: teachers release questionnaire stars, and students conduct self-assessment and mutual assessment through questionnaire stars. Students carefully fill out the questionnaire star survey, real self-evaluation and mutual evaluation. Self-evaluation and mutual evaluation requires students to truly evaluate themselves and others, and guide students to cultivate a realistic work attitude.
9. Teacher’s supplement: According to the results of questionnaire star survey, students’ weak links are supplemented. Students check the omissions and fill in the gaps, and consolidate the key content. And the working principle of the vision sensor is explained again to break through the difficulties.

Summary

This paper studies the application of task-driven method in the teaching of automobile intelligent sensor technology, describes the implementation process of the method, analyzes the main points and matters that should be paid attention to in the teaching of the method, puts forward the main problems, and finally makes a case study. The application of this method fully mobilizes the enthusiasm of students in learning, and also teaches students in class, and gets the ideal teaching effect.

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