

The Research and Practice of Information-based Teaching in the Course of Automotive Electrical Appliances in Higher Vocational Colleges

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Abstract: "Automotive electrical appliances" is an important professional course for automobile testing and maintenance technology and other majors. In view of the characteristics and shortcomings of traditional teaching, the network resources of the information-based teaching resource base, which is constructed by making full use of modern educational techniques, have the characteristics of intuitiveness, novelty and freedom from time and space. The course of automotive electrical appliances in higher vocational colleges is designed with information technology, which effectively improves the teaching efficiency of the course.

1. Introduction

In the Internet age, information-based teaching has become a hot spot of theoretical discussion and practical lasso in the field of classroom teaching in colleges and universities ^[1]. Information-based teaching is a bilateral activity between students and teachers by combining advanced information technology with teaching methods, advanced teaching concepts and teaching resources. The vehicle electrical engineering, especially automotive engineering course is an important professional basic course, the teaching focus is on the car body composition and working principle of electrical system, circuit to read, and simple fault diagnosis and maintenance, has a strong technical and practical, to student's comprehensive ability, logical thinking and practice ability request is higher, but the basic knowledge of higher vocational students is weak, understanding ability is limited, it requires professional teachers teaching reform and to explore suitable teaching mode, improve teaching quality, developed to meet the requirements of rapid development in today's society technology application talents ^[2].

2. Characteristics of Information-based Teaching

Information-based teaching is a specific application of constructivism theory in classroom teaching in the new era ^[3]. It emphasizes student-centered teaching, emphasizes the importance of offline learning, independent learning and inquiry learning, emphasizes the design of students' learning environment, and encourages students to use various multimedia and information resources to support students' learning. In teaching activities, teachers are changing from teacher-centered to student-centered, and teachers are changing from lecturers of knowledge to guides for students to acquire information actively. Information-based teaching promotes students' independent learning across time periods and regions in teaching, including audio, text, multi-dimensional animation, video and other multimedia, creating a virtual and real learning environment for students, integrating direct perception with understanding. Information-based teaching enables students to use fragmented time to study, realize pre-class preview, online learning and after-class review of the courses they have learned, and pay attention to the latest technology and production process at any time, which constructs a new information-based teaching mode for automobile testing and maintenance major in higher vocational colleges.

3. Features of Automotive Electronics Course

Automobile electrical appliances are a professional direction course of automobile detection and maintenance technology major in higher vocational colleges. It is practical, logical, flexible and abstract [3]. In traditional teaching, static pictures are mainly used to explain the working principle, which cannot well reflect the dynamic working process. The use of physical electrical equipment disassembly and testing, the number of students, equipment is less, students cannot see clearly or cannot see, also not comprehensive. Although PPT is marked with different colors, video effect is not obvious. Students often have no clue, no method in analysis, and no way to start detection.

4. Informatization Teaching Practice of Automotive Electrical Appliances

4.1 Information Teaching Design of Automotive Electronics Course

Taking the higher vocational colleges of Xijing university as the implementation point, the students of the class of automobile detection and maintenance technology major in 2017 were selected to carry out research and carry out the information-based teaching of automobile electrical appliances, so as to meet the requirements of information teaching. Make full use of the integration of online and offline information technology curriculum, using the vehicle electrical field "high-quality goods resource sharing network platform, develop and enrich the new maintenance manuals and animation and other information technology, the vehicle electrical text, video, audio, images, video, and other kinds of resources, integrate into the digital network learning resources, to student's learning finishing sorting, induction, screening and summarized, delete old resources, complement, upgrade and update, make the vehicle electrical informationization teaching resources not only perfect facilities, at the same time can also keep up with the development of era, novelty, advancement and innovation. On the other hand, the network platform to further improve the "quality resources sharing", and design an information-based teaching model and carry out case studies, based on automobile testing and maintenance technology to carry out teaching practice, summarize the teaching effect.

4.2 Construction of Network Platform and Function Module Design of University-Level "High-Quality Resource Sharing Course" for Automotive Electrical Appliances in Higher Vocational Colleges

The course of automobile electrical appliance is the professional core course of automobile detection and maintenance technology major in higher vocational colleges. The course combines theory and practice closely and integrates some teaching contents of automobile structure and automobile electrician and electronic technology, which has strong practicality and application. The course of "automotive electrical appliances" was completed in the campus teaching and training base, and students completed their learning in the real working situation. Students throughout the whole journey in a garage or a car 4 s shop, so you have access to many practical problems in practice, combined with the distribution of students in different positions, possible problems are completely different, therefore, in order to increase the timely communication and interaction between teachers and students, meet the demand of personalized learning time, in nine bamboo platform established the vehicle electrical "high-quality goods resource sharing lessons". In platform course according to the enterprise actual working process of the project tasks arranged and students' cognitive regularity, optimization of engineering alternation teaching mode, highlight the theory knowledge and the cultivation of practice ability and the construction of the rich resources of curriculum resource, to meet the diverse needs of the higher vocational teachers and students, social education learners, achieve the advanced teaching ideas and the sharing of resources.

4.3 Case Analysis of the Teaching Unit of Automotive Electrical Appliances

Through practice, application of informatization plays an important role in improving teaching quality and efficiency. It can use animation to demonstrate the case that the car starting system cannot

be started, use the network resources of "high-quality resource sharing class" to let students preview the learning content in advance, use WeChat discussion group and QQ discussion group to establish a platform for students to learn and communicate, issue task orders, and feedback teachers' classroom evaluation. The creation of teaching situation with vivid pictures, pictures, sound and video resources can more related to the image, vivid and realistic presentation of teaching content, mobilize students' learning enthusiasm and expand students' thinking, improve classroom learning efficiency, so as to achieve the expected teaching effect. Online: Before class, the teacher prepares the teaching content through the network of "automobile electric appliance" "high-quality resource-sharing course", mainly designing targeted learning activities and preparing relevant teaching resources, and answering questions for students online. According to the learning problems and ideas provided by teachers, students can learn actively online, including self-learning course content, caliper quiz, online discussion and other activities. After class, students focus on consolidating, expanding and improving according to the learning tasks provided by teachers, including work submission, group discussion and other activities. Offline: Teachers organize the teaching of integration of science and practice, teachers teach while doing, students learn while doing, and in practice constantly repeat and strengthen; teachers and students discuss and solve the problems encountered in the province. Finally, the platform is evaluated according to the feedback of students' scores.

4.4 Implementation of information-based teaching in the classroom

1) Preview before class

Teachers should make full use of existing information resources and arrange some open and extended data search. Students make use of abundant information resources to prepare their lessons in advance.

2) Create a situation and stimulate interest

Teachers set up classroom introduction, stimulate students' interest in learning. Teachers use multimedia to directly play the car electrical fault comments input on the information platform, sound and painting are vivid and intuitive, making students have the interest of exploring and learning and the desire of hands-on practice and problem solving in the learning situation. Guide students to carefully observe the failure phenomenon with the problem of learning, not only let students clearly target, but also pointed out the direction for students.

3) Collect data and learn independently

Teaching provides an information platform. Under the premise of defining learning tasks, students collect information, consult data, analyze problems, sort out ideas, and write diagnostic procedures. It is better to take students as the main body, task as the carrier, problem solving as the line, cultivate students' self-learning ability, and improve students' ability to collect information.

4) Group discussion and collaborative learning

For the purpose of solving problems, according to the most reasonable and efficient principle, each student participates in group discussion and consultation according to their own solutions to further improve and deepen the construction of new knowledge. In such collaborative learning, different viewpoints of students collide and stimulate the construction of new knowledge and skills. Such as in the "auto wiper fault diagnosis return the problem of low gear of" teaching, the students are learning "auto wiper read" cognitive structure, working principle, circuit, on the basis of through independent learning, to be involved in the group discussion to solve the problem, hands-on practice, try to complete car wiper low gear does not return the analysis of the solution. In the whole teaching process, teachers only encourage and affirm the way of auxiliary guidance, the traditional one-way acceptance of learning to independent inquiry and cooperative learning mode.

5) Hands-on practice, test and verification

After the virtual training, students are fully confident to participate in the actual training, which can not only reduce the accidental injury caused by students in the practical training operation, but also alleviate the shortage of practical training resources. For example, in the practical operation of starting engine disassembly, the team will cooperate with each other to disassemble and install the starter through the division of labor through negotiation. After the first attempt, the team will take

turns to change the guard. Each student will practice repeatedly for several times and become proficient in disassembly within the time limit. Then, a team confrontation is adopted to achieve the goal of being fast and accurate. Finally, the starter assembled by each team is installed on the car to observe whether it can start smoothly, so as to verify.

4.5 Teaching Evaluation

Informationization teaching practice was carried out among students majoring in automobile testing and maintenance technology in the class of 2017. After the practice, questionnaires were distributed to students by means of investigation and research to investigate the feedback of the informationization design teaching effect of "automobile electrical appliances". The evaluation of teachers' teaching effect not only refers to the part of classroom teaching organization, but also includes the preparation before class and the content improvement after class. The content of the evaluation should not only depend on the teaching situation of the teaching content and the quantitative teaching effect, but also consider the degree of teachers' information technology ability, the ability of teachers' information teaching design, the teaching organization ability in the whole course, the understanding of the teaching content, the ability to master and comprehensively apply it [4]. After the end of this course, the final examination results of 2017 students of this course and the final examination results of other parallel classes were analyzed. It was found that the final examination results of this class were significantly different from those of other parallel classes, and the excellent rate and pass rate were significantly higher than those of other parallel classes.

5. Conclusion

The information-based teaching course of automobile electric appliance has been welcomed and supported by students, which has played a certain complement and improvement to the traditional teaching mode. In vehicle inspection and maintenance technology in classroom teaching and practice teaching professional core courses, how to scientific and reasonable use of informatization of modern teaching technology, deal with the combination of traditional teaching modes and modern teaching means, is a complex and difficult task, needs to fumble ceaselessly front-line teachers and practical experience, to find a suitable for higher vocational colleges education teaching method is the most important thing.

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