

On the Reconstruction of Automobile Electronic Courses in the Connected Automated Vehicle

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Abstract: The rapid development of Connected Automated Vehicle challenges the traditional training mode of automobile electronic professionals. According to the development direction of automobile industry in the future, this paper puts forward some suggestions to improve the training mode of automobile electronic technology talents from the aspects of reconstructing curriculum system, increasing professional courses, strengthening the construction of teachers and exploring the cooperation between schools and enterprises.

1. Introduction

The strength of national competitiveness is increasingly reflected in the strength and weakness of modern vocational education system with the rapid development of science and technology and the rapid promotion of new industrialization ^[1]. However, there are still some problems in China's higher education, such as not deep-seated, not strong attraction, relatively old training mode and so on. The emergence of intelligent Internet connected vehicle (ICV) has brought great challenges to the cultivation of talents of traditional automotive electronics specialty. It is imminent to explore the cultivation mode of automotive electronic technology professionals in the context of ICV, which marks the rapid entry of China's ICV industry Development stage.

2. Challenges of Connected Automated Vehicle

Based on the Internet of vehicles technology and artificial intelligence technology, the Internet of vehicles technology connects the vehicle and people, vehicle and vehicle, vehicle and road through the Internet of vehicles, which is the product of the integration of automobile and information technology and artificial intelligence. Sensors, cameras, radars, image processing and positioning devices are used to collect data, and the collected data is transmitted to the remote cloud platform through the on-board system. The decision-making is made by the artificial intelligence module, which controls the driving of vehicles, and realizes the avoidance of obstacles, the selection and optimization of traffic routes ^[2]. The intelligent network car technology can greatly alleviate traffic congestion and reduce traffic. Therefore, improve the use efficiency of parking lot, reduce vehicle fuel consumption, and reduce the burden of drivers. The original auto driving technology can realize auto driving by adding cameras, radars and other devices, while the networking technology enables cars and cars, cars and people, cars and roads to contact each other, and the intelligent decision-making module makes the intelligent networked car possible. In order to better optimize the route of vehicles and reduce traffic congestion, vehicles can be centrally controlled through local cloud center and remote cloud center. The development of automobile in the future challenges the training of traditional automobile electronic technology professionals. Sensor, location, environmental perception and path selection technologies related to the intelligent network connected vehicle are currently included in some professional courses related to the computer major, but these courses are not generally covered in the current training plan of the automotive electronic technology major. Graduates of the automotive electronic technology major in the future need to master whether they are engaged in automobile maintenance or automobile design and

production Therefore, the traditional training mode of automotive electronic technology needs to be improved.

3. Problems in the Curriculum System

Some vocational colleges in China have actively explored the project achievement curriculum development mode and tried different implementation modes in recent years which has played an important role in promoting the curriculum reform of Vocational Education in China. The project course is based on the actual needs of the post, with the actual work process as the reference to design the teaching content and organize the teaching process, and with the vocational ability training as the goal ^[3]. The project course comprehensively uses relevant knowledge, theory and skills to complete the work tasks, and runs through the theory and practice with the work tasks. It strengthens the connection between the course content and the work, gradually cultivates the ability to analyze and solve problems in the complex work situation, and improves the comprehensive professional ability of students in learning and cooperation. At present, China's model colleges and universities have carried out the promotion work of the curriculum development method based on the working process, and carried out the pilot. The introduction of this advanced curriculum model has given hope and dawn to the curriculum reform in the field of Vocational Education in China, but because of the deep-rooted concept of the traditional discipline curriculum in China. The curriculum development of vocational education, which is really combined with the working process and oriented by the working process, is still in the exploration stage. At present, the main content of the reform of colleges and universities is the reform based on the working process of the curriculum. The setting of the curriculum system still retains the shadow of the discipline system, resulting in many problems to be solved, such as the disconnection or repetition between the curriculum and the work post.

4. Improvement Plan of Talent Training Mode for Automotive Electronics

4.1 Add Relevant Professional Courses

In order to adapt to the development direction of the future automobile industry, the graduates of automobile electronics specialty should not only meet the requirements of the traditional professional employment field for talents, but also meet the new requirements of the intelligent network automobile technology for talents ^[4]. However, the traditional automobile electronic technology majors only offer core courses such as automobile electrical equipment and maintenance, automobile electronic control technology, automobile single chip microcomputer and LAN technology, new energy automobile technology, etc., and the jobs of students are generally related to automobile electronics, new energy automobile, etc. Obviously, the direction and orientation of the traditional automobile electronic technology professional training is not completely consistent with the development demand of the automobile market in the future. Intelligent Internet connected vehicle technology is an interdisciplinary subject, involving communication, computer, cloud computing, big data and other related knowledge. It is necessary to further adjust and optimize the existing curriculum system of automotive electronic technology, such as adding intelligent vehicle technology, Internet of vehicles technology, Linux For new courses such as operating system, if the amount of class hours in the training plan has been saturated and it is difficult to add more courses, it can be considered to add only one new automobile technology course involving intelligent automobile technology, Internet of vehicles technology and Linux operating system. Due to the rapid development of the new automobile technology, and the intelligent network automobile technology is also in the research stage at present, the teaching materials of relevant courses are very few, so it is suggested that these courses be carried out in the form of lectures, and teachers can choose their own good direction to explain in several times ^[5]. In this way, we can continuously inject new knowledge into the curriculum, and at the same time, we can solve the problem that it is difficult to prepare lessons and the effect of

lessons is not ideal because the curriculum involves a wide range of knowledge. Under the new curriculum system, students not only master the traditional knowledge of automotive electronic technology, but also learn the knowledge of intelligent Internet vehicle technology, which increases the employment opportunities, improves the efficiency and quality of employment.

4.2 Strengthen the Construction of Teachers

The teachers of automotive electronic technology are generally graduates of automotive electronics, vehicle engineering, mechanical engineering and other related majors. With the rapid development of intelligent Internet connected vehicle technology, teachers need to know both traditional automotive electronics and intelligent Internet connected professional teachers, but there is a lack of such professional talents in the society at present, so the school can introduce some communication engineering, computer control technology, Internet of things and other professional teachers for the automotive electronic technology major, so when the curriculum involves cross professional knowledge, it is different Teachers of professional direction can exchange and study with each other; in addition, they should carry out centralized training on Intelligent Internet connected vehicle technology for existing professional teachers, and send one or two teachers to the Internet of vehicles enterprise for further study every year to learn the latest intelligent Internet connected vehicle technology^[6]. In addition, in the teaching process, the teaching mode based on task driven autonomous learning in the working process is adopted to fully mobilize the initiative of students' autonomous learning. After the case description of the project, the task and learning plan are made for each learning project for the students, and the related teaching is completed with various teaching methods, and the practical training plan is made, and then the practical training task is completed by the students' team cooperation. For example, when installing equipment, debugging equipment and repairing faults, students will consult materials and teachers. After solving problems, they will have a new grasp of theoretical knowledge and practical experience, and stimulate their interest in learning. Open type training can also be adopted, and combined with the actual engineering projects of companies and enterprises in the market to carry out engineering research and development training, so as to make the post ability and key ability develop in coordination and jointly cultivate, so as to meet the needs of professional skills posts.

4.3 Improve Students' Practical Ability

Practical teaching system plays a very important role in higher vocational colleges, including curriculum experiment, individual basic skills training, professional curriculum design, graduation design, enterprise production practice and other parts. Under the cooperation of the course system of knowledge, through the standardized and systematic training of students in the practical teaching system, they can master the basic operation skills of electrical and electronic technology and the application ability of electronic technology related posts. When the practical teaching is implemented, the nine-word policy of "setting the project, clarifying the goal and strict assessment" must be implemented. Students are required to take every detail of practical operation seriously and improve their practical ability. In order to strengthen the cultivation of practical ability, practical teaching generally accounts for a large proportion within the learning period, about 50% of the total class hours of professional teaching. The practical training base is an important platform for cultivating the practical ability of students majoring in automotive electronic technology. As the intelligent Internet connected vehicle technology is a new technology, most colleges and universities generally lack relevant training equipment and training venues, but to build their own training base, it will cost a lot of money and material resources and manpower, and because the new technology is updated too fast, it can not guarantee that the technology is always leading, so we can consider cooperating with large Internet of vehicles enterprises to build training base, and invite enterprise engineering Teachers and teachers of our school teach together and learn from each other, which not only saves the cost of running a school, but also introduces the new technology of enterprise Internet of vehicles. Through school enterprise cooperation, students have learned the latest professional knowledge and mastered practical skills, which can achieve the goal of "good employment", "good career" and "good employment".

4.4 Improve Students' Practical Ability

The off-campus practice of automobile electronic technology major in many colleges and universities is generally carried out in large-scale automobile manufacturing enterprises. The main contents of the practice are general assembly, welding and coating. Students generally do not have access to the technologies and products of the network connected automobile. In the future, the employment of students is in urgent need of knowledge and skills in this area. Therefore, some enterprises that develop and produce the network connected automobile parts can be considered to increase Practice for students. This can not only consolidate the knowledge of students' computer, but also cultivate the skills of students in the Internet car, and lay a solid foundation for the smooth employment of students in the future. In addition, we should attach importance to the online teaching resources of the course, and make use of the information technology means such as online material resources, pictures, simulation animation, video recording, student courseware, online learning system, etc. to realize the cross and complementarity in and out of class. In spare time, the course forum module is built to provide a communication platform for teachers and students, enhance the interaction between teachers and students and between students and students, facilitate teachers' guidance and timely solve the problems encountered in students' learning, so that the communication between teachers and students is not limited by time and space, thus greatly improving the learning efficiency of students.

5. Conclusion

The state has also intensively issued some policies and development plans on the Connected Automated Vehicle with the development of communication technology, Internet of technology and artificial intelligence technology. In this context, it is particularly important to explore the reform of auto electronic technology talents training. If we want to cultivate talents who can adapt to the development of intelligent Internet vehicle technology, we can start from changing the direction of professional orientation, improving the training program, introducing and training professional teachers' team, exploring the school enterprise joint construction of training base and increasing the off campus practice enterprises, so as to promote the better and faster development of China's automobile industry.

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