

Research on the Reform of New Energy Vehicle Technology Specialty under the Background of ICV

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Abstract

With the transformation and upgrading of the automotive industry, Intelligent Connected Vehicles(ICV) have become the development direction. By analyzing the reform background of new energy vehicle technology specialty and according to the results of recent research, this paper puts forward relevant suggestions on the reform of new energy vehicle technology specialty in Higher Vocational Colleges from the professional orientation, talent training mode reform, curriculum system reform, teaching staff construction and training base construction, so as to provide reference for colleges setting up new energy vehicle technology specialty.

Keywords

Intelligent Connected Vehicles; New energy vehicle technology; Professional reform.

1. Introduction

In the past decade, China's new energy vehicle industry, as a key industry supported by national policies, has developed rapidly in passenger cars, buses, logistics vehicles and so on. Several national ministries and commissions including the Ministry of industry and information technology, the Ministry of science and technology and the Ministry of finance have invested nearly 20 billion yuan in the field of new energy vehicles, and basically established the formation of the basic technical system of "three vertical and three horizontal" for electric vehicles (three vertical: fuel cell vehicle, hybrid vehicle and pure electric vehicle; three horizontal: multi energy powertrain system, motor drive system and control unit, power battery and battery pack management system) The new energy vehicle technology specialty set up in higher vocational colleges has also made great progress. In recent years, the integration of automobile, artificial intelligence, information communication and other fields has accelerated, and the development of automobile intelligence and networking has become the consensus of all sectors of government, industry, University and research. According to the prediction of intelligent networked vehicle technology roadmap 2.0, by 2025, China's PA (partial automatic driving) and Ca The sales volume of (conditional automatic driving) intelligent networked vehicles accounts for more than 50% of the total sales volume of vehicles in that year, and the assembly rate of new vehicles of c-v2x (mobile Internet of vehicles based on cellular communication) terminals will also reach 50%. The new energy vehicle technology specialty also needs to be further adjusted and optimized with the transformation and upgrading of the industry.

2. Analysis of Research Results

2.1. Analysis of Enterprise Research

According to the survey, the largest demand for graduates majoring in new energy vehicle technology required by enterprises in the next 3-5 years is new energy vehicle maintenance workers, followed by new energy vehicle assemblers, and then new energy vehicle quality inspectors. At the same time, the demand for relevant posts of intelligent networked vehicles will be increasing. Enterprises suggest that higher vocational education should strengthen professional practice and post practice while strengthening the cultivation of vocational skills, especially the training of students' humanistic and social science quality, students' Outlook on life, professional ethics and professionalism, students' organization and coordination ability, language and written expression ability. At the same time, enterprises hope that graduates should have relevant knowledge and certificates of intelligent networked vehicles to adapt to industrial development.

2.2. Analysis of Graduate Research

Graduates believe that there is still room for improvement in the actual training effect of the school, especially the depth, breadth and practical operation of knowledge need to be strengthened; More than 60% of those who took part in the survey took part in various certificates that were helpful or certain to their work; Graduates are basically satisfied with the curriculum, teaching content and teaching level, but there are a small number of dissatisfaction and dissatisfaction in the professional practice teaching link; They generally agree with the professional basic knowledge and professional knowledge, and think it is more important.

Graduates suggest to add courses such as automobile maintenance enterprise management and automobile parts design, and integrate the latest technology into the existing courses; It is suggested to hire more off campus personnel to take part-time courses to make the teaching closer to the actual production; It is suggested to improve the school teaching environment and avoid a large gap with the real production and institutional environment of enterprises.

2.3. Analysis of Research in Similar Universities

Selectively selected the national backbone, national demonstration and high-level similar Vocational Colleges in the province as the research object. The vast majority of colleges and universities have an annual employment rate of more than 90%. More than 66.7% of the graduates majoring in new energy vehicle technology trained by higher vocational colleges are mainly engaged in new energy vehicle electromechanical maintenance, vehicle performance testing, technical training, vehicle sales and other jobs. Intellectualization and networking are the reform direction of new energy vehicle technology specialty in Colleges and universities.

3. Specialty Construction and Reform

3.1. Adjustment of Professional Orientation

The training objectives of new energy vehicle technology specialty are adjusted as follows: facing the technical service direction of new energy vehicles and intelligent networked vehicles, cultivating students who meet the requirements of China's socialist modernization, develop in an all-round way morally, intellectually, physically and aesthetically, and have good professional ethics and professional quality; Master solid theoretical knowledge of modern vehicles and advanced technology, process, equipment and management knowledge of new energy vehicles and intelligent networked vehicles; Ability to maintain, test, diagnose and repair new energy vehicles; High quality workers and technical talents who have the foundation

of career development and are competent for the front-line work of automobile technical service.

Initial employment post: new energy vehicle maintenance personnel, new energy vehicle installation and commissioning personnel, new energy vehicle quality inspector and new energy vehicle tester. Expand employment posts: intelligent Internet connected vehicle installation and adjustment personnel, new energy vehicle technical service consultant, new energy vehicle salesperson, used vehicle appraisal and appraiser, etc. Development post: automotive technical service manager, automotive aftermarket enterprise manager, senior manager of small and medium-sized enterprises.

3.2. Reform of Talent Training Mode

Relying on new energy vehicles and intelligent networked automobile enterprises, establish enterprise colleges and improve the talent training mode of "double subject" education of schools and enterprises. Build a professional ability training idea close to the post, in line with the post and adapt to the "three steps" of the post, and implement the work study alternating talent training mode of "three progressive" practical teaching of post recognition, post learning and post replacement. Reform and innovate multi semester, segmented and other teaching organization forms to create conditions for Industry and enterprise technical experts and craftsmen to participate in professional teaching.

3.3. Reform of Curriculum System

3.3.1. Optimize the Professional Curriculum System

With the goal of "bottom sharing" of professional groups, build professional basic courses of "mechanical foundation + electrician and electronics + automobile culture + automobile structure + automobile maintenance" to serve automobile related professional groups; Taking the job requirements and typical work tasks or processes of the main engine plant and automobile aftermarket as the carrier, build the professional core curriculum of "three electricity + electricity + Network + whole vehicle", and cooperate with schools and enterprises to develop the project-based curriculum standards, curriculum design schemes, evaluation standards and teaching materials of "course certificate integration". Guided by expanding vision and promoting career development, build professional development courses of "management + Design + intelligence", which can be selected from other majors in automobile related professional groups.

3.3.2. Promoting the Construction of Ideological and Political System of Professional courses

Xi Jinping's spirit of socialism with Chinese characteristics is put forward in China's new era, and the ideological and political education resources contained in professional courses and teaching methods are fully explored. For example, China's new energy vehicle technology and intelligent network technology development, the "Xi Jinping destiny community" and "network power strategy" and other new socialist ideas of socialism with Chinese characteristics, promote professional teachers to assume "curriculum thinking and politics". The main responsibility is to do a good job in the teaching design of professional curriculum education, integrate the achievement objectives, mapping points, implementation process, evaluation methods, teaching reflection and other elements of curriculum ideological and political education, and form a professional curriculum ideological and political system.

3.4. Construction of Teaching Staff

It is planned to arrange full-time teachers to practice in enterprises related to intelligent networked vehicles for half a year to one year, truly understand the development trend of the automotive industry and the demand of enterprises for graduates and interns, improve the

technology accumulation of new energy vehicles and intelligent networked vehicles of full-time teachers, and improve teachers' Comprehensive core abilities such as new product trial production and troubleshooting. At the same time, the experts and excellent employees of the enterprise are invited to provide on-site guidance, participate in the curriculum construction, integrate the standards and requirements of the enterprise into the curriculum, and develop practical teaching projects. Through project operation, strengthen the three core abilities of professional teachers (teaching ability, social resource integration ability and social service ability), cultivate the team spirit of "innovation, dedication, practical work and cooperation", and form a project construction team with the combination of full-time and part-time, clear tasks and both morality and technology.

3.5. Construction of Training Base

3.5.1. Construction of New Energy Vehicle Training Base in the School

Give full play to the role of the training base in the organization of teaching activities, teaching curriculum development, professional knowledge training, technical skill training, event undertaking, social training services and other fields, and carry out the overall planning and design of the training base. On the one hand, improve the construction of "three electricity + whole vehicle" training base, and increase the construction of virtual simulation training room. Virtual training is combined with real operation, virtual training is first followed by practical operation, so as to improve the safety factor of students' training, reduce the damage rate of training equipment, and effectively improve the effect of training teaching. On the other hand, with the goal of completing the assembly, adjustment, maintenance, inspection and repair of intelligent networked vehicles, combined with the requirements of 1 + X certificate standard, map the real work scene of the enterprise front line to the training base, and build a new intelligent networked vehicle training room.

3.5.2. Construction of New Energy Vehicle Training Base outside School

Actively cooperate with intelligent networked automobile related enterprises to establish a new off campus training base. Strengthen process management, make out of school teaching and in-school teaching synchronous, in the same order and in the same quality, realize the "deep coupling" with the employing enterprise from the aspects of teaching plan formulation, curriculum construction, post knowledge, post study, post practice and even employment, and promote the enterprise to feed the professional construction through thoughtful service work.

4. Conclusion

China's automobile industry is facing a "undergoing changes unseen in a century". Higher vocational colleges must comply with the trend and constantly optimize and adjust their majors. According to the demand for talents in the current industrial chain, the new energy vehicle technology specialty should timely and accurately adjust the talent training objectives and professional curriculum system, create a reasonably structured double division team, improve the internal and external training base, strengthen the cooperation of industry enterprises, cultivate high-quality compound technical and skilled talents, and make due contributions to the promotion of regional industrial upgrading and development.

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