

# Research on the Construction of New Energy Vehicle Technology Specialty under the Mechanism of Industry Education Integration and Education

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## Abstract

In the new era, with the rapid development of the national economy, the automobile industry is gradually changing from the traditional internal combustion engine with heavy pollution to the new fuel vehicle with new energy and new technology. Regarding to this industry trend, the vocational colleges constantly innovate the education mechanism and update the teaching methods, gradually supporting the new energy vehicle industry in line with the direction of production and education integration education mechanism of new energy vehicle professional personnel training mode, has a certain reference and reference significance.

## Keywords

**Integration of Production and Education; New Energy Vehicle Major; School Enterprise Cooperation.**

## 1. Introduction

In the implementation plan of national vocational education reform issued and implemented by the State Council in January 2019, it is clearly pointed out that the development of meeting employment and industrial needs is the ultimate goal of vocational education development. Vocational colleges can try various ways of school enterprise cooperation with enterprises, so as to finally provide high-quality and skilled talents for the society. With the help of the domestic government, new energy vehicles have become a new direction for the development of the automotive industry. Combined with the author's talent training program construction of new energy vehicle technology major in Suzhou Institute of industry and technology, this paper explores the talent training program setting, curriculum system construction and teaching team construction based on school enterprise cooperation with Jinlong United Automobile Industry (Suzhou) Co., Ltd.

## 2. Significance of the Research on the Educational Mechanism of the Integration of Industry and Education

The integration of industry and education education mechanism takes the training of applied technical talents as the training goal, teaches students according to their aptitude, optimizes the knowledge, ability and quality structure of the training object, and the way to achieve this goal. Through the integration of industry and education, higher vocational colleges can appropriately add enterprise elements on the basis of their complete discipline system. On the one hand, it can ensure the education and teaching of traditional disciplines, on the other hand, it will quickly improve the quality of professional discipline education and teaching. In order to cultivate high-quality technical talents, higher vocational education must implement school

enterprise cooperation training, send students to enterprises for skill training, and let students adapt to work posts and role transformation in advance.

## **2.1. Research Objectives**

Learn from the European and American school enterprise cooperation system, focus on school enterprise cooperation and cultivate people, and build a higher vocational new energy vehicle technology talent training mode with the main characteristics of real post and people. The Automotive Engineering Department of Suzhou Institute of industry and technology and the advanced technology research institute of Jinlong United Automotive Industry (Suzhou) Co., Ltd. jointly formulate talent training programs, jointly develop courses, jointly organize teaching, jointly formulate student evaluation and assessment standards, do a good job in double teacher teaching and management, and cooperate with students to complete practical training and employment.

## **2.2. Research Contents**

### **2.2.1. Joint Construction of New Energy Technology Specialty**

Suzhou Jinlong technical director as the professional leader of the enterprise; Invite Jinlong managers and professional technicians to participate in professional construction, teaching plan, curriculum standard formulation and other construction work; Employ Jinlong professional and technical personnel to take part-time courses, hold technical lectures and classroom meetings for enterprise senior engineering, guide students' graduation design or graduation practice, introduce real projects of Jinlong Institute of advanced technology into majors, and teachers and students of Automobile Engineering Department assist in completing various quality engineering projects at all levels.

### **2.2.2. Construction of Campus Training Base**

Build a new energy commercial vehicle technology training room. The original automotive engineering department has always focused on the development of new energy cars with small vehicle quality (Geely Dihao ev450 and ev300, etc.), built vehicle new energy training room, new energy battery training room and new energy motor training room, built a new energy three electricity training operation system, and focused on cultivating students' post market maintenance technical ability of small new energy vehicles. Now we introduce the vehicle resources of Jinlong new energy commercial vehicles (Jinlong has successfully developed and mass produced automatic unmanned vending vehicles and automatic navigation minibuses), and build a new energy commercial vehicle technology training room, which not only enriches the content of professional teaching curriculum system, but also meets the productive training teaching of various new energy vehicle maintenance and vocational skill certification. The enterprise will appoint engineers to participate in teaching and teachers' practical skills training.

### **2.2.3. Overseas Service Technician Class**

Build Jinlong overseas service technician class. In view of the pick-up of overseas orders, especially in Africa, Suzhou Jinlong United Automobile Industry (Suzhou) Co., Ltd. implements double salary treatment (domestic salary plus overseas travel subsidy), enterprises and colleges conduct foreign project assembly, commissioning and test (technician) training, and the teaching and training process is fully parameterized with the actual work process.

### **2.2.4. Master Studio Construction**

Build a master studio. Haige Vocational School under Suzhou Jinlong United Automobile Industry (Suzhou) Co., Ltd. has used the advantages of enterprise schools for many years to train a group of excellent enterprise masters and employees. The Automotive Engineering Department of Suzhou Institute of industry and technology will build a master studio in Haige

vocational school, give full play to the important role of high skilled leading talents and teams in apprenticeship, skill tackling and skill promotion, support the technical skill innovation of high skilled talents, and promote the achievements of technical skill innovation.

### **3. Implementation Methods and Steps of Industry Education Integration Education Mode**

#### **3.1. Study Initiation Phase**

After visiting and investigating Jinlong United Automobile Industry (Suzhou) Co., Ltd. to understand the employment needs of Suzhou Jinlong enterprises, carry out data collection according to the professional post capacity requirements of its subordinate advanced technology research institute, grasp the context of the formulation of early talent training plan, and fully pave the way for school enterprise cooperation, So as to finally sign a talent training agreement with Suzhou Industrial Vocational and technical college in the form of enterprise orders.

#### **3.2. Research and Experimental Stage**

According to the data from the survey, formulate and adjust the setting and professional direction of new energy vehicle technology specialty of Suzhou Industrial Vocational and technical college. At the same time, the school and enterprise cooperate to jointly prepare the talent training plan of new energy vehicle technology specialty, and take the talent training plan jointly formulated by both sides as the starting point to parameterize and quantitatively calibrate the curriculum system of new energy vehicle technology specialty. According to the sequence of the project workflow of Suzhou Jinlong Institute of advanced technology, the professional curriculum system is also divided into three different levels, which are public basic courses (Fundamentals of computer application, etc.) Professional core courses (four systems of traditional vehicles and three electric systems of new energy vehicles, etc.) and professional expansion and improvement courses (application and maintenance of advanced sensors, etc.). Through the discussion of talent training plan, the negotiation of education and teaching methods and the determination of systems and regulations, schools and enterprises cooperate with the enterprise training courses finally required by the specialty to jointly improve the all-round education and teaching of students, take the integrated experimental training base as the carrier, meet the enterprise standard requirements, scientifically and rationally set up the professional curriculum system and construct and optimize the professional curriculum.

#### **3.3. Summary Stage**

Set up Jinlong new energy automobile college with the participation of both schools and enterprises to guide the construction of new energy automobile technology specialty. The major shall hold at least two meetings every academic year to exchange professional talent training and actual demand information within the framework of Jinlong new energy automobile college, approve, revise and improve the curriculum teaching schemes at three different levels of professional talent training scheme and professional subject system, and encourage and support full-time teachers to take part-time exercise in Suzhou Jinlong, Jinlong engineer is employed as an external teacher of new energy technology specialty of Suzhou Industrial Vocational and technical college. Teachers and technicians of both sides participate in and carry out curriculum development. At the same time, Jinlong new energy automotive college has set up a "teaching and production quality management office". Jinlong engineers and professional teachers carefully and deeply quantify the difficulty of the learned content and their mastery degree, early arrangement, later evaluation, whole process supervision, through face-to-face communication and hand-to-hand operation with students in class, enterprise production recess and experimental training place Effective management. Under the

management of Jinlong new energy automobile college, a school enterprise college, the two sides conduct real-time evaluation of the real-time process of education and teaching and the corresponding integrated teaching effect of theory and practice. From the enterprise standard to the class process and then to the training effect, they always feed back to the teaching subject, form a benign education and teaching mechanism and realize the best mode of school enterprise cooperative teaching.

#### **4. Innovation of Education Mode of Integration of Industry and Education**

As one of the few automobile manufacturers in Suzhou, Jinlong United Automobile Industry (Suzhou) Co., Ltd., as the enterprise side, has opened its subordinate advanced technology research institute to work with the Automotive Engineering Department of Suzhou Institute of industry and technology to jointly formulate and adjust the professional setting and professional direction of new energy vehicle technology in its department, and jointly prepare the talent training plan of new energy vehicle technology. Jointly parameterize and quantitatively calibrate the curriculum system of new energy vehicle technology specialty, and establish Jinlong new energy vehicle college. Under the effective carrier and promotion of the school enterprise college, it takes enterprise standards as the requirements, double teachers as the teaching (external teachers and full-time teachers of the enterprise) and digital quantitative assessment standards as the final assessment criterion to improve the quality of education and teaching in an all-round way. The new energy vehicle technology specialty under the mode of industry education integration focuses on cultivating technical talents who serve the production process, quality inspection, technology development, technology application and after-sales service of new energy vehicle and its key parts assembly production and R&D enterprises, constructs the construction of new energy vehicle technology specialty under the mechanism of industry education integration, and puts forward feasible Scientific talent training is a guarantee system for a virtuous circle, which promotes the economic and social development of Suzhou, and reserves and transports a number of high-quality technical talents for enterprises.

#### **5. Conclusion**

New energy vehicle technology specialty is an emerging specialty that matures with the development of automobile industry. Constructing the talent training mode of new energy vehicle technology specialty in higher vocational education is the only way to cultivate high-quality new energy vehicle talents. School enterprise cooperation, training room construction, teaching resource database construction and teacher construction are the main construction objectives of the main body of higher vocational education. Its ultimate goal is to provide more high-quality and high-tech automobile talents for the automobile industry.

#### **References**

- [1] Li ZHANG. Exploration and practice of modern apprenticeship mode under the dual education of industry and education, school and enterprise.
- [2] Peiyun ZHANG. Thoughts on the integration of industry and education and the "dual" education of schools and enterprises. Journal of State Grid Institute of Technology.
- [3] Yanhong DAI. Research on talent training mode of school enterprise cooperation specialty. Professional time and space.
- [4] Yulei MA. Research and Practice on the integration of industry and education and the innovation of "dual" education mode of schools and enterprises. Journal of Harbin vocational and Technical College.