

# Exploration and Practice of Personnel Training Mode of Electrical Automation Equipment Installation and Maintenance Major Based School Enterprise Cooperation

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**Abstract:** Through the analysis of the necessity of school enterprise cooperation in personnel training, the results and implementation experience of our school enterprise cooperation personnel training based electrical automation equipment installation and maintenance major, a conclusion can be drawn: the school enterprise cooperation in personnel training is the only way of occupation education, is an effective mode of personnel training in medium occupation education.

**Key words:** School enterprise cooperation; Necessity; Implementation measures

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## 1 Introduction

In recent years, with the large-scale development of enterprises and the actual production needs, training of skilled workers skills have increasingly attracted great attention of the country and society, as the main way of medium occupation education in our country at present technical workers skills training, their educational ideas, training mode, especially the application and practice of the training mode of school enterprise cooperation personnel, get more attention by the whole society.<sup>[1]</sup>

## 2 The Necessity of Personnel Training in School

### Enterprise Cooperation

#### 2.1 What is School Enterprise Cooperation Personnel Training?

The *high-skilled personnel training system construction of" the 11th Five-Year "plan (2006 - 2010)* developed by the Ministry of labor and social security pointed out that the school enterprise cooperation personnel training is that the establishment of high skilled personnel training system of schools enterprises cooperation is closely combined with the enterprises according to the demand for highly skilled personnel. The plan points out vocational colleges need closely integrate the requirements of high skilled jobs, meet the national vocational standards, determine the training objectives, reform the teaching model, and adjust the content of teaching, to realize the close integration of school teaching and enterprise needs. The plan also points out, while vocational colleges undertake systematic education to cultivate high skilled talents, they should take the task of training highly skilled workers. The plan encourages enterprises to combine the actual needs of highly skilled personnel, and work together to develop training plans for vocational schools to provide training venues for the school, select practice instructors, and attract students to participate in key technical problems.<sup>[2]-[3]</sup>

#### 2.2 The Personnel Training of School Enterprise Cooperation is the Demand of Current Employment

## **Situation of Electrical Professionals**

Because of the particularity of electrical automation equipment installation and maintenance major, the employment situation is not optimistic all the time, in the daily production and life, electrical professional and technical personnel is mainly responsible for the installation and maintenance of electrical equipment, which requires technical personnel not only have a solid theoretical knowledge and strong practical ability, but also requires a certain practical experience, so there is a "older better than younger". In the traditional mode of medium vocational education, although schools pay attention to solving the students' theoretical knowledge and practical ability, but the promotion of work experience has not been able to solve very well. Under the business model of state-owned enterprises, after recruiting students of electrical major, the enterprises will arrange the technical personnel to help the students through the model of "master brings apprentice, through 1 to 2 years of practice, gradually increase students' practical experience. But with the market economy and the change of people's values, this model has disappeared. How to solve this situation is the urgent problem to be solved in our vocational education.<sup>[4]</sup>

### **2.3 The Personnel Training of School Enterprise Cooperation is the Need of Enterprise Production**

The enterprise attaches great importance to production efficiency and economic benefit, so for new graduate, on the one hand, there is a great gap between the knowledge they have learned and the equipment they will contact, the production environment, so students must have a transition process and time to adapt; on the other hand, the graduate do not have time to adapt that because of the enterprise production efficiency and enterprise staff positions competition. How to use the school resources and reasonable practice model to resolve this contradiction, and adapt to the requirements of modern production, is the important direction of our teaching reform.

### **2.4 Personnel Training in School Enterprise Cooperation is the Need for Vocational Education to**

## **Improve Itself**

Students are school products, but also are the entire enterprise education products, and the quality of this product depends on the needs of enterprises and social employment to test. Therefore, through the improvement of education mode based employment orient, through the combination of education and study, order training, school enterprise integration, Production-Learning-Research integration mode and so on, put the actual production demand into teaching, establish and use personnel training mode of school enterprise cooperation, give full play to the role of enterprise and talent demand lever in the occupation teaching, to enhance the level of China's occupation education.<sup>[5]-[7]</sup>

## **3 The Implementation Measures of Personnel Training Mode of School Enterprise Cooperation**

### **3.1 Determine the Curriculum System through the Investigation of Enterprise Demand**

According to the education policy of "the service for the purpose, employment for the guidance, the quality for the core, improvement the integration education model reform, promotion education innovation, and improvement the educational efficiency, highlight the school characteristics", in order to put actual production needs of enterprises into teaching, we first visited nearly 60 enterprises in Tianjin city, through the investigation, questionnaire, understanding the needs of enterprises for the quality of the staff, know the needs of the production for professional knowledge, skill level. Through research, we determined the tasks of electrical automation equipment installation and maintenance major based on job. After collecting, we invited experts and front-line technician from school long-term cooperation enterprise and professional teachers to take forum, according to production needs, the task will be reextraction to form task summary based on the occupation station and get the teaching system of electrical automation major.

### **3.2 According to the Actual Needs of Production,**

### **Establish Personnel Training Program**

According to the formatted curriculum system, under the personnel training mode, we organized professional teachers to revised and formulated the "regular + optional integration" personnel training mode program. The "regular + optional integration" personnel training mode program.: student's study in school will be divided into two stages, the first stage in the program must be on the basis of theoretical knowledge, while focusing on the study of middle and senior technical standard knowledge, strengthen the occupation skill, and, put the related theoretical knowledge into skill training according to the "use enough" principle, to implement of personnel training mode of "integration", and to obtain the corresponding certificate, this stage is students' compulsory stage; the second stage is the comprehensive skills enhancement stage, according to students' characteristics and the situation that student learn and grasp content, the curriculum was divided into professional skills improvement model, Production-Learning-Research integration model and skills elective module, professional skills improvement model is mainly used for students to complete the compulsory teaching content and improve it; Production-Learning-Research integration model is mainly used to bring enterprise into the school, students enter the production practice training base to study, through completing the task closely actual production situation, the students get to grasp and consolidate the knowledge and skills, while students can adapt to the production requirements ahead of schedule; skills elective module is mainly for the students who do not fully grasp the advance knowledge, that students can choose to restudy it according to their situation. professional skills improvement model mainly includes tasks such as mechatronics system design and debugging, maintenance and application of building automation, industrial automation instrument assembly and maintenance, competition skill enhancement, the competition skill enhancement can improve students' employability and stimulate the enthusiasm of the

students' entrepreneurship through daily training and skills contest, the competition skill enhancement can be combined with the actual competition time to flexible arrange, and can concentrate, can also dispersed in spare time, students can choose according to the situation.<sup>[8]</sup>

In order to make the teaching content much closer to the production demand, and more meet the requirement of enterprises for personnel, we extracted typical tasks and invited the enterprise experts and forefront technical staff to select from our teaching subject and content according to the production task, to convert production tasks into the task of teaching, this makes student master production requirements in the school. At the same time, in order to better cooperate with the "integration" of personnel training model, we made the "credit system implementation program". Through the "regular + optional integration" personnel training program, we can enhance the core skills of the students and the overall quality of students, truly make a solid foundation for meeting the job needs, the successful employment of students and the perfect employment of students

### **3.3 Cooperate with Enterprises to Build High Quality Core Courses**

#### **3.3.1 Develop the Curriculum and Teaching Plan**

According to personnel training program, we arranged teachers related major to modify and develop the syllabus related to courses and teaching plan, after revised school hired experts and enterprise forefront technicians to demonstrate combined production needs.

#### **3.3.2 Work on the Key School-Based Teaching Materials and Training Guide Book**

According to the survey, the curriculum system and personnel training program was developed. After a full investigation and verification, we organize forefront technician of enterprises, together with the teachers, study teaching style and uniform format, write textbook and outline, and write the task. the enterprise technical personnel get task division, compile the task.<sup>[9]</sup>

### **3.3.3 High Quality Core Curriculum Construction**

In order to highlight our "integration" features, better integrate digital campus construction and the existing practice conditions and equipment as well as the needs of enterprises, we work together with software companies, for the core curriculum's simulation, animation, video and material library and so on, we integrated. This improved the level of teaching resources. It not only meets the needs of teaching and learning of students, but also realizes the full sharing of resources, to a certain extent, play a leading role in demonstration.

### **3.3.4 Combine Work with Learning, Integrate Existing Training Room Function**

In the construction of laboratory teaching hardware, in order to improve the existing training function, expand the students' employment ability, in accordance with the "production practice environment", the training room in accordance with the function and the practical project optimization and integration planning, complete training base construction plan, organize experts and leaders to demonstrate the plan.<sup>[10]</sup>

### **3.3.5 Combine Production with Training, and Give Full Play to the Function of Intramural Training Base**

All along, the school takes Tianjin fifth machine factory and Tianjin Yuan Feng Technology Co., Ltd. as our school training base, it plays an important role in school enterprise cooperation, production training combination and other aspects. In order to promote students to further contact with the actual production, so we arrange each class into two school training base for 4 weeks of production and training combination in the fourth semester. The students are grouped by Yuan Feng company according to the production tasks, such as machine parts assembly, mechanical parts installation, electrical installation, electrical wiring, circuit board welding. The master is responsible for the different students. Through actual production tasks, students improve the manipulative ability and fully understand the actual situation of production, lay the foundation in order to go to work.

### **3.3.6 Practice in Enterprises, Promote Teaching and Enterprise Win-Win Situation**

Through the practice of teachers in-depth enterprises, on one hand, it can contact the actual production, understand the production needs about teaching mode, teaching contents and methods, and these needs are integrated into the teaching to further improve teaching quality, promote the cultivation of the students' occupation quality, and meet the social demand for skilled personnel. On the other hand, the teaching experience, teaching needs was integrated into the design and production of the products of the Yuan Feng company, and we actively participated the project development work of the Yuan Feng company and compilation work of training experimental guide textbook to promote teaching products closer to teaching and better services for occupation education and skills training. In order to overcome the shortcomings of previous 2013 Yuan Feng company training equipment used in teaching, we and the Yuan Feng company together upgraded and transformed DCS-32 type DC speed regulation cabinet and JC-2 machine fault circuit training cabinet, organized teachers to teach student installation production in accordance with the production process to effectively enhance our school teachers R & D and production organization ability, to lay a solid foundation for the integration of teaching in the future. Due to the construction of model school, my school teachers participate in the project development of Yuan Feng company, including industrial line training device, modular manufacturing training system, 3D interactive industrial automation integrated training platform and the all integrated automation system management software project. We cooperated with the Yuan Feng company to prepare training guidance materials, completed two books of the "machine fault maintenance training course" and "practical guide".

## **4 The Practical Significance of Personnel Training Mode of School Enterprise Cooperation**

The cooperation between school and enterprise can make teachers fully understand the needs of the enterprises, through it the occupation education and teaching is closer to the actual production, and better improve the teaching quality of teachers; the cooperation between school and enterprise can make the learning content of the students and enterprises needs to be zero distance and practical exercise and professional station to be zero distance. It can promote students' practical ability and comprehensive qualities and can improve the students' employment level to solve occupation practical educational problems and difficulties, especially in the secondary occupation education. Therefore, it is the duty of teachers to actively promote the school enterprise cooperation personnel training mode. It is the duty of secondary vocational schools and it is the only way for vocational education.

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