

## Exploration of Practical Talent Cultivating Mode of Rail Transit

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**ABSTRACT:** With the rapid development of China's high-speed railway, inter-city railway, urban light rail and the subway, we have a growing demand for talented personnel, and the requirement for the personnel is higher and higher, especially the demand of practical ability. But nowadays, the shortage of professional and technical personnel is still very prominent. As the main position of cultivating professional and technical personnel in railway field, the colleges and universities must pay more attention to talent cultivation, attach great importance to the strategy research of the teaching mode, reform the traditional teaching mode, and implement the talent training mode of "university-enterprise cooperation, and engineering-teaching combination", to shoulder the task of training of railway professional and technical personnel. The article summarizes the cultivating mode of the innovative talents in the major of rail transit signal and control, hope to be helpful to the cultivation of talents in this field.

**KEYWORDS:** Rail transit , Talent cultivating, teaching mode, University-enterprise cooperation , Engineering-teaching combination

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### I. INTRODUCTION

As the artery of the China's economic development, the importance of railway is self-evident. In future development, in order to realize the goal of win-win and win more, in implementing the collaboration mode of "horizontal cooperation", "vertical integration" and "strategic alliance", we must pay more attention to the personnel training strategy. We must adhere to the guiding principle of "establish the talent priority development strategy, adhere to the talent resources prior development, talent structure prior adjustment, the talent investment prior guarantee, personnel system prior innovation", and fully understanding the fundamental stand to promote the development of rail transit is to cultivate more high-skilled talents<sup>[1, 2]</sup>.

From the perspective of long-term development, to complete the multiple development goals, such as high-speed, overloading, informationization, to achieve modernization and the application of the new knowledge, new technology and new equipment, China's railway and rail transit industry need a large amount of professional talents with high comprehensive quality and strong professional skills, and must have a sea of high-skilled personnel with high scientific and cultural qualities, high comprehensive quality, and solid technical strength<sup>[3]</sup>. The development of highly skilled personnel is not only beneficial to improve core competitiveness of railway enterprise, but also generate great demonstration effect and promoting role in constructing the high-skilled talent team of the national industries.

With the rapid development of China's economy and the expanding of the city, rail transportation of more and more cities have reached the golden age, successively entering the age of "light rail era" and "subway era". At the same time, demand for the professionals in rail transit quickly soars. Currently existing talent cultivation system is not perfect and mature, therefore, how to cultivate personnel with high professional quality, strong professional skills and meet the requirements of the enterprise, has become a problem that the major of the rail transit signal and control in all colleges and universities must face. "Engineering-teaching combination, university-enterprise cooperation" is the only way for the major of the rail transit signal and control to cultivate high-quality talents with high skill<sup>[4, 5]</sup>. This work discusses the cultivating mode of the innovative talents in the major of the rail transit signal and control, hope that it is helpful to the cultivation of talents in this field.

### II. IMPORTANCE OF TEACHING MANNER REFORM

At present, the practical ability of domestic workers in the rail transit field and the level of the graduates does not match. Enterprises require that the graduates have considerable practical and hands-on ability, but majority of personnel cultivated by the colleges and universities focus on the theoretical learning, so there is disconnect on the talent requirements between the enterprises and the colleges<sup>[6, 7]</sup>. Introducing the talent

cultivating mode of “engineering-teaching combination, university-enterprise cooperation” can realize a perfect docking between the universities and the enterprises. University-enterprise cooperation refers to the multi-level and comprehensive cooperation on professional construction, curriculum system, faculty construction and practice condition between the universities and related companies. With the help of the training resource of the enterprises, we can well combine the classroom teaching and practice, the school education and the off-campus internship, and runs through the whole four years cultivation process of the students. Students learn theory knowledge and the vocational training in the classroom, gain experience in the internship. Therefore, they can lay a solid foundation for the better future work development. Above all, “engineering-teaching combination, university-enterprise cooperation” is a novel teaching mode which combines the advantages of both the universities and enterprises, the talents cultivated can both conform to the requirements for the students from the colleges and universities, and meet the needs of innovative ability from the employers, thus the student cultivated is a kind of composite practical talents who can effectively combine the theory with practice.

### **III. SUMMARIZATION OF THE TEACHING MANNERS**

#### **(1) “3+1”cultivating mode reform**

“3+1” cultivating mode means that the students spend three years to study the theory and one year to attend the internship. We increase the internship time to solidify the practical ability of the students<sup>[8]</sup>.

The professional practical teaching of the rail transit signal and control can be divided into three levels: first, in the first semester of the fourth year, training teachers organize the students to carry out the comprehensive professional training in campus training rooms. Second, after the campus training, the students are sent to the enterprise to perform training and practice. Practice has two modes, one is field work which means that the students go to the enterprises to participate in the concrete work of the rail transit signal detection, diagnosis and maintenance. Enterprises arrange specific person to discuss and communicate with the students. Another mode is training practice which means that the universities cooperate with related training institutions, and establish the training laboratory in the school and perform the secondary special training for the students.

#### **(2) Build practical ability training as the core of talent cultivation system**

By combining the advantages of the theory education of school and practical, professional ability of the enterprises, realizing the co-operative education, students can not only learn the systematic theory knowledge, but also undertake vocational ability training in the enterprise practice. Through exploring the manner of university-enterprise collaboration to cultivate the professional ability, we can perfect the cultivating mode and cultivating system.

Moreover, we can establish a set of the management system to ensure the quality of specialty construction, universities and the enterprises jointly supervise and manage the construction process, perfect the construction measures and improve the construction quality.

#### **(3) Constructing the teacher team**

Because of the rail transit signal and control specialty is emerging in recent years, and it is our school’s new professional, so teachers’ level is relatively weak. In order to better adapt to the teaching model of “university-enterprise cooperation, and engineering-teaching combination”, we should construct a high-quality teacher team. Teachers not only have profound theoretical knowledge, but also have strong ability of practical production. University teachers usually have solid theory foundation of basic skills, while the enterprise personnel have rich manufacture experience, through the combination, we can construct a teacher team conforming to the “university-enterprise cooperation, and engineering-teaching combination”. Therefore, all the professional teachers in the rail transit signal and control must take part-time work in an enterprise, to participate in the normal production and operation, increase their practical ability. At the same time, we employ the technical backbone of the industry enterprises to be the part-time teachers of the practical skills classes. Study and communication between the teachers can effectively improve the full-time teachers' practical teaching ability.

#### **(4) Constructing the teaching experiment training conditions**

In terms of the requirements of basic ability training, professional ability improving, according to the three levels: basic professional training, special professional skills training, professional and comprehensive training, we build the training rooms of rail traffic signals/sand table simulation training, rail transit signal control laboratory, microcomputer interlock training laboratory, and provide the students with the campus experiment and training rooms. In addition, through cooperating with the related enterprises, we establish and perfect the practical teaching management system of the rail transit signal and control, develop the off campus internship and training bases, and ensure that each graduate can finish one year’s internship program.

## **(5) Reforming teaching methods to adapt the development of the information technology**

### 1. Multi-media teaching method

In order to improve knowledge quality of the classroom teaching, we can adopt the advanced teaching means such as multimedia, which can guarantee the integrity of the course content under the limited class hour. At the same time, teachers can refer large amounts of data in extracurricular, and introduce the current development of rail transit, especially some new conditions and new technology of the urban rail transit and high speed railway development to the students. Nowadays, we have completed the rail transit lines design teaching courseware, and constantly revise and perfect the content in the teaching process. Through the multimedia courseware, we effectively improve the teaching quality and increase the unit class lectures.

### 2. Case teaching

During the teaching, combining the concrete case of the design, operation, and management of the rail transit lines, the teachers can efficiently explain and analyze the different cases, to improve the students' ability to apply the basic theory. The teachers can design the rail transit typical case, put the knowledge into the design and manufacture procedure of the typical case, let the students have obvious learning destination, and master the knowledge and skills in completing the case.

### 3. Video teaching

Restricted by the teaching hours, for the students who lack of understanding of the rail transit lines design, theoretical teaching is often too abstract. Therefore, teachers can make full use of video resources, using the class time and outside of class time, carry out the video teaching, to make up of the inadequate theoretical teaching and enhance the students' perceptual knowledge.

### 4. Bilingual teaching

Teacher should adopt the bilingual teaching gradually, and at the same time, add some relevant content about the foreign rail transit line design, to make the students know and grasp not only the course content, but also understand the dynamic development of rail transit line design technology at home and abroad, and achieve a better teaching effect.

## **(6) Strengthening the practical teaching of the course design**

Perfect the outline of course design and strengthen the direction of the course design. Teachers write the course design instruction to match the course teaching, used to guide the practical courses. Instructions written should be comprehensive, strong operability, timely update, and can guide the practical teaching. During the using, based on the advice of numerous students, the course design instruction has been modified and perfected many times. At present, the course design instruction has been generally accepted by the students and teachers. Curriculum design mainly carries on the appraisal of the students from two aspects, namely, the integrity of the design content, accuracy of the calculation process and standardization of the design specification. The appraisal combines the design process and the design results.

## **(7) Graduation design combined with production and scientific research practice**

In the graduation design teaching, universities should strengthen the combination with the production practice and scientific research practice. We assign the students to the rail enterprises to carry out their graduation practice and graduation design. During their participation in the production process, the guide teachers assign the design task in combination with the production task, and guide the students to complete their graduation design task with the field engineers.

## **IV. CONCLUSION**

This paper discusses the importance of the teaching manner reform in the major of the rail transit signal and control, and summarizes the concrete teaching reform methods from the following aspects: "3+1" cultivating mode reform, build practical ability training as the core of talent cultivation system, constructing the teacher team, constructing the teaching experiment training conditions, reforming teaching methods to adapt the development of the information technology, strengthening the practical teaching of the course design, and graduation design combined with production and scientific research practice.

Teaching manner reform is a process of continuous improvement, in this procedure, we should continuously summarize the experiences and address the new problems. Generally, if we can effectively implement the talent training mode of "university-enterprise cooperation, and engineering-teaching combination", and try every way to improve the teaching quality, thus we can cultivate more and more innovative talents.

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