

Exploration on the construction of professional quality system of rail transit equipment under the background of new era

Chunyan Yao

(School of Rolling Stock, Nanjing Railway Polytechnic, Nanjing 210031, China)

Abstract: The equipment manufacturing industry is an important part of the national economy and national defense construction, with the characteristics of high industrial correlation, strong driving force, high technical content, strong driving ability, etc. The manufacturing industry is an important carrier to build a strong manufacturing country, is the only way to realize the Chinese dream, is an important symbol of comprehensive national strength. At present, China's rail transit equipment manufacturing industry has entered the camp of intelligent equipment intelligent manufacturing, with the continuous expansion and wide application of artificial intelligence field, to further promote the rapid transformation and upgrading of rail transit equipment industry.

Vocational education is the main position of rail transit industry skills personnel training, which means that rail transit industry related majors need to reconstruct the knowledge system, ability system², literacy system, in the "three comprehensive education" environment to cultivate lifelong learning ability, multi-technology composite, multi-disciplinary literacy of the new era of technical skills personnel. To further support the great changes in the new era of equipment manufacturing industry.

Key words: New era; Rail transit; professionalism

1. New requirements for vocational education for the development of rail transit equipment industry

1. New changes in industry development

At present, the rail transit equipment manufacturing market is changing from "product manufacturing oriented" to "product manufacturing service oriented". The product service oriented demand means that customers are no longer satisfied with obtaining specific products from enterprises, but tend to obtain a dynamic product service flow³ composed of products and a series of services in the whole life cycle of product and product-related design and development, manufacturing, operation and maintenance, technical support, remanufacturing and so on.

After the cloud manufacturing technology was proposed by Academician Li Bohu and others in 2012, the smart chemical plant began to develop gradually, and the production services of the rail transit equipment industry have undergone tremendous changes, including the in-depth use of artificial intelligence and the extensive sharing of big data. Gradually formed a complete rail transit equipment manufacturing industry chain integrating intelligent manufacturing, intelligent operation and maintenance, information sharing, cloud technology and other advanced production technologies.

2. New changes in the demand for talents for industry development

With the continuous investment and upgrading of smart factories in the rail transit equipment industry, coupled with the changes in the market direction of the rail transit equipment manufacturing industry, new changes have been brought about in the requirements of industrial workers' job skills, knowledge system, comprehensive literacy and other aspects. Therefore, industrial workers who can adapt to changes as soon as possible and follow up technological progress in a timely manner have become a new direction for the training of professional education talents of rail transit equipment in the new era.

2. The new changes in personnel training methods

The talent training goal of vocational colleges is to provide high-quality and high-quality industrial workers for related industries. In the process of rapid development of rail transit equipment industry, the ability of one specialty and multiple abilities, pioneering and innovation, lifelong learning and other abilities are the key directions of talent training in vocational colleges.

1. Ideological and political education into all learning and life

In the course implementation process, we should pay attention to the integration of ideological and political elements, break the situation of ideological and political education and professional education, implement moral education into the whole teaching process, all-round and full staff, and build a general pattern of education.

Create and introduce learning situations, closely related to the history of the Party, the development of China's rail transit and the development of famous rail transit related enterprises, so that students can feel the speed of national development, stimulate students' patriotic feelings, and enhance students' sense of national pride and professional mission; In the process of classroom teaching, we will actively publicize advanced and exemplary deeds, invite enterprise mentors to the teaching site demonstration and participate in class evaluation, so that students can have a deeper understanding of professional norms, experience the professional quality of the post, and cultivate students' rigorous and standardized, independent innovation, diligent self-improvement and excellence attitude; After class, students participate in various development activities, skill training and competitions in small groups, so that students' initiative and

creativity can be fully displayed; The unique teaching materials, the teachers’ words and deeds, and the exemplary advanced deeds have influenced the students silently, and strive to make the students become the talents of the new era with ideals, wisdom, noble character, creativity and courage to open up.

2. Integration of production and education, deeply integrated into intelligent manufacturing, intelligent operation and maintenance of new technologies

The teaching team works closely with enterprise technical experts to jointly develop talent training programs, curriculum standards, teaching content and assessment, and aims to jointly evaluate teaching quality. The school and enterprise cooperate to develop practical equipment that meets the needs of the field, build a practical training platform for the integration of production and education, and realize the sharing of talent training materials inside and outside the school. Make full use of the complementary resources of enterprises and schools, constantly enrich the classroom, create a work context-style classroom teaching with industrial characteristics, create a smart manufacturing, intelligent operation and maintenance frontier classroom, carry out in-depth “learning, doing and using” learning activities, to achieve school-enterprise resource sharing, talent co-education, cooperation and win-win.

3. Modular curriculum of “integration of post and class spiral”

According to the requirements of the curriculum reform of the integration of post and course, the integration of knowledge and practice is the main line, so that professional knowledge and professional application are closely linked, and the course content is integrated into the basic module (focusing on structure and function, cooperating with daily maintenance work and production cases), the improvement module (focusing on working principle learning, cooperating with the in-depth inspection and production cases of a single system/component), and the expansion module (focusing on comprehensive application, Cooperate with the whole system comprehensive production case) three modules; With professional service post requirements as the core, develop projects covering professional-related jobs (groups); Taking typical work tasks as the carrier, carefully designing the teaching links that apply knowledge to practice; With moral education as the foundation, the ideological and political themes are integrated into the whole process to realize the organic integration of professional knowledge, job application and ideological and political infiltration. Figure 1 is the urban rail transit vehicle control system installation course as an example of the design of enterprise production positions for the integration of the course module.

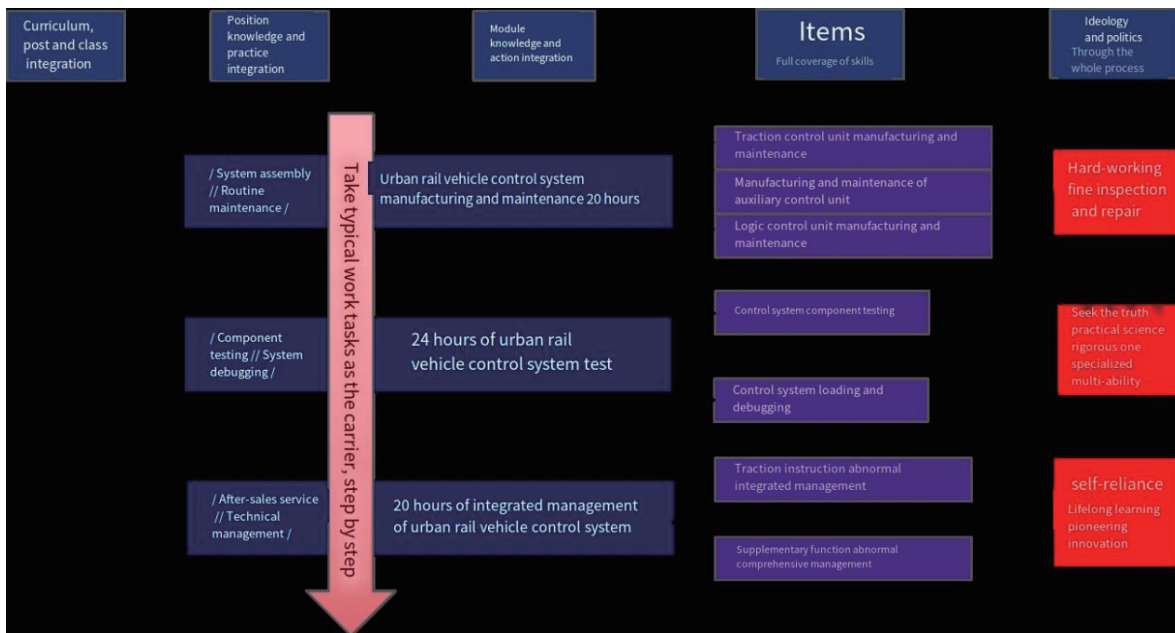


Figure 1 is the course module for the integration of posts and courses for enterprise production positions

3. Innovate new teaching models that meet the requirements of The Times

Professional courses need to take typical tasks of rail transit equipment industry as the carrier, create real career situations, and adopt the anchor-anchored teaching mode based on job site under the guidance of constructivism theory. The requirements for multi-functional posts should be added in the vocational situation that fits the actual situation, requiring students to realize the importance of one specialty and multiple abilities from the beginning of enrollment, and gradually develop the learning habit of active learning through theoretical learning and operational training.

In the teaching process, the “anchoring” teaching method is implemented to encourage students to try, question, debate, collaborate and practice. Teachers, as collaborators, solve advanced problems with students together, and display and evaluate the results, so as to fully mobilize students’ thirst for knowledge. Design and implement spiral advanced learning tasks, form a closed loop of learning, help students from passive knowledge receivers to active knowledge builders, enhance students’ confidence in learning.

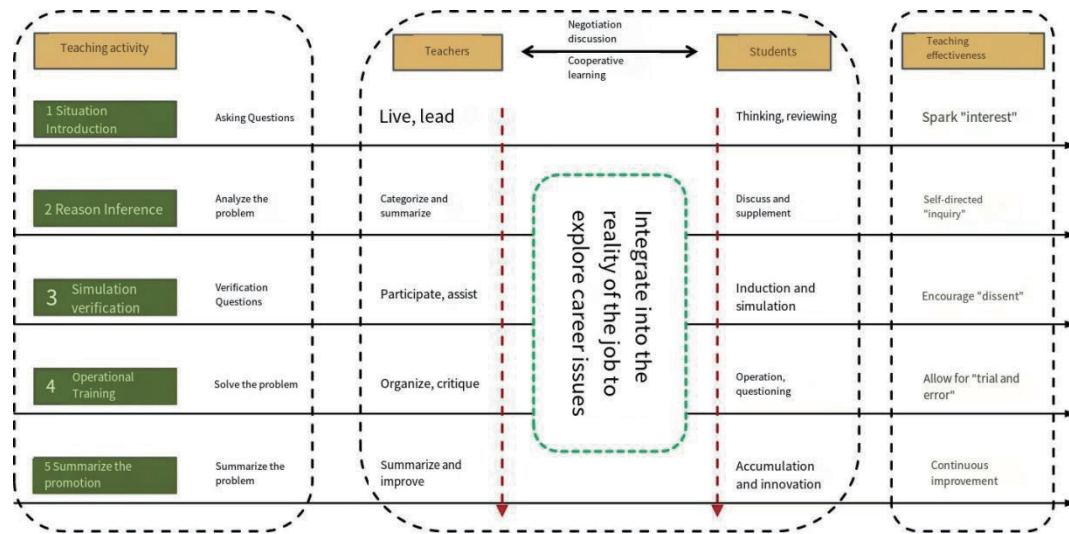


Figure 2: Exploring career issues and integrating them into job realization

4 Conclusion

The professional development of rail transit equipment is standing at the key crossroads of industrial upgrading, and whether the professional development planning of relevant vocational colleges can adapt to the needs of industrial structure changes in the new era has become the key point of professional survival. A professional that can meet the requirements of industrial workers in the new era with the spirit of innovation, lifelong learning ability and the requirements of one specialty can support the rapid development and endless growth of the rail transit equipment industry.

References:

[1] Huicong Zhou. Research on Development Strategy of J Company of Rail Transit Equipment Manufacturing Industry [D]. Beijing Jiaotong University, 2022

[2] Dashuai Wang. Research on the construction of professional quality system of railway specialty in Higher vocational Colleges under the background of Intelligent operation and maintenance [J]. Henan Education, 2022,12.

[3] Fei Di,Jingling Li,Jinjun Wu,Ying Wang,Wu Wen, etal. Research on Key Technologies of Service Platform for Rail Bus Equipment Manufacturing Industry [J]. Development and Innovation of Mechanical and Electrical Products,2021,11.

[4] Wenjing Du,Deqiao Huang,Yanfang Guo,Jun Liu, etal. "Three Full Education" in Higher vocational Colleges: Important characteristics, System Support and Realization Path [J]. Adult Education, 2023,7.

[5] Jian Mo. Construction of four-year Higher vocational curriculum System for Rail Transit Equipment Manufacturing major [J]. Journal of Light Industry Science and Technology, 2012,12.

Acknowledgements (fund) :

Supported by the "Blue Project" of Nanjing Vocational Institute of Railway Technology. Supported by the "Blue Project" of Nanjing Vocational Institute of Railway Technology

Supported by the 'Blue Project 'of Jiangsu University. Supported by the 'Blue Project' of Jiangsu University

Nanjing Railway Vocational and Technical College School-level Party Building, Ideological and Political Project (Exploration and Practice of Ideological and Political Education in Railway Professional Courses from the perspective of "Sanquan Education" ---- Taking EMU Maintenance technology major as an example 2022SD011) Supported by the "Party Building and political Project Ideological and Ppolitical Issues" of Nanjing Vocational Institute of Railway Technology(2022SD011)