

Analysis on the training strategy of transportation equipment manufacturing professionals from the perspective of integration of production and education

Pengwei Zhang Yiying Tu

Jiangxi Transportation Vocational and Technical College, Jiangxi Nanchang, 330013

Abstract: High end equipment manufacturing is a major industry that affects the core competitiveness of the country. Industrial innovation, transformation and development put forward higher requirements for manufacturing talents. However, the current talent training standard is difficult to keep up with the pace of industrial development, and students lack practical ability. The integration of production and education has become a channel connecting the talent training of schools and the talent demand of enterprises, providing ideas and directions for the sustainable development of schools and enterprises. In this context, the school should closely contact with local enterprises, closely follow the needs of industrial development, pay attention to the requirements of front-line posts, optimize the education environment, build an education platform integrating industry and education, and cultivate multiple types of talents in production management and technology research and development, which can not only solve the problem of insufficient practical ability of students, but also output excellent talents meeting the talent selection criteria to enterprises. This paper analyzes the connotation of the integration of industry and education in the new era, expounds the necessity of implementing the integration of industry and education in higher vocational colleges, introduces the premise of promoting the integration of industry and education in schools and enterprises, and explores the training strategy of transportation equipment manufacturing professionals.

Keywords: integration of production and education; Transportation equipment manufacturing; personnel training

The integration of industry and education is an important mode to coordinate education supply and industrial demand, which has a profound impact on the school's building of a high-quality education system and the sustainable development of enterprises. From the perspective of education supply, the embryonic form of the integration of industry and education is school enterprise cooperation, which was initially the responsibility of vocational education and local enterprises entrusted by the state. It requires schools and enterprises to work together to combine vocational education, social training and technical services by sharing educational resources and technical service resources, and output talents matching social needs. From the perspective of education demand, the integration of industry and education is not only an objective demand for enterprises to connect with school education services, but also a personal demand for talents to take a good career development path. Therefore, by promoting the integration of industry and education, the school can not only refer to the enterprise talent selection standard, introduce front-line resources, improve the practicality of theoretical teaching and practical teaching, but also combine the learning development of students, introduce corporate culture and management content, connect teaching content with work tasks, and achieve the connection and integration of education chain, industry chain and talent chain.

1. The connotation of the integration of industry and education in the new era

In order to further improve the social service ability of vocational education, the state strongly advocates vocational colleges to explore the talent training mode of integration of learning, production and education. On the surface, "production" not only represents enterprises, but also refers to production activities related to economic development; "Teaching" not only refers to schools, but also refers to education related departments. The integration of production and education requires relevant enterprises and various colleges to integrate their respective advantages on the basis of ensuring independence, break the traditional concept of school enterprise cooperation, and enable enterprises to establish a sense of responsibility for actively cultivating talents. Different from the power and responsibility distribution system of school enterprise cooperation, the integration of industry and education requires both parties to define talent training objectives,

deepen cooperation, provide comprehensive resource guarantee for talent training, and achieve the coordinated development of industry and education.

2. The Necessity of Implementing the Talent Training Mode of Integration of Production and Education in Higher Vocational Colleges

2.1 The need to implement educational policies

From the perspective of vocational education, schools need to follow the general trend of social and economic development, establish a modern education system adapted to society, promote school enterprise cooperation and integration of production and education, and cultivate more high-quality, versatile and practical talents. In the new era, the state encourages schools to develop a multi type and multi-level vocational education model, guides the whole society and industry to participate in vocational education, integrates industrial resources with school resources, and builds a vocational education system with local and national characteristics. At the same time, relevant departments require vocational education to clarify the development principle of integration of production and education, and improve the quality of talent training and practical education level with the help of enterprises and social forces. Only by strictly implementing the educational principles and policies, paying close attention to the growth needs of skilled personnel and the trend of social and economic development, can the school clarify the direction of teaching reform based on employment, optimize the talent training mode, update the teaching content, and then improve the integration of industry and education, dual education mechanism.

2.2 Keep up with the requirements of the times

With the accelerated process of industrial informatization, technology intensive production gradually replaces labor-intensive production mode. Enterprises urgently need a group of high-tech and high-quality application talents, which puts forward higher requirements for technical talents and labor talents. Only by following the trend of the times and connecting professional standards, industrial norms and teaching processes, can the adaptability of talents be improved. At the same time, the manufacturing industry is at an important stage of transformation and development, and major enterprises are paying more and more attention to the innovation ability of talents. To meet the needs of enterprise talents, schools should not only pay attention to theoretical teaching, but also constantly introduce front-line practical achievements and innovative ideas to cultivate students' innovative spirit. Therefore, by accelerating the integration of industry and education, both schools and enterprises can integrate superior resources, embed enterprise management and enterprise work in the process of talent training and development, improve the adaptability of talents, and better serve the society and enterprises.

2.3 The need to improve the competitiveness of schools and enterprises

Under the mode of integration of production and education, the school can formulate targeted talent training programs according to the needs of partners, set up corresponding curriculum groups around the post work standards, and adopt the talent training program of "students+staff", so that students can enter the post training to develop their post competency and adaptability. Compared with the traditional talent recruitment and enterprise training methods, the integration of production and education reduces the cost of enterprise talent training and improves the employment rate of talents in higher vocational colleges. Under the strategic requirements of building a manufacturing power, enterprises need to constantly improve their self-development capabilities and core competitiveness to achieve innovative development. Talent is the key element of enterprise innovation and development. Only by deepening the cooperation with the school, promoting the combination of work and learning, promoting post practice, and unifying production, teaching and research, can we reasonably link the talent needs of enterprises with the talent training objectives of the school, and build a high-quality and innovative talent team.

2.4 Requirements for sharing school and enterprise resources

At the level of education and teaching, the school and the enterprise promote the integration of production and teaching, which can

provide students with real work and internship opportunities, make them contact with work standards, work processes and advanced equipment in advance, and solve the problem that the school's training equipment is not advanced. At the same time, enterprise tutors can rely on their rich practical experience to provide guidance for students' practice and practice, which can not only expand the vision of full-time teachers, but also solve the problem of lack of industry experience. In addition, by promoting the integration of industry and education, the school can provide intellectual support and technical consulting services to enterprises, help enterprises improve their core competitiveness, and thus achieve a win-win situation for schools and enterprises.

3. Preconditions for school and enterprise to promote the integration of production and education

3.1 Build a transportation equipment manufacturing collaboration center

Together with local transportation equipment manufacturing enterprises and supporting manufacturing enterprises, the school can build a transportation equipment collaborative manufacturing center with the support of relevant departments. Based on the technological innovation points and product demands of enterprises, the school can strengthen cooperation with enterprises to promote technological integration, technological innovation and knowledge innovation. Focusing on the manufacturing field of EMUs, urban rail cars and electric locomotives, all major entities can give play to their technological synergy advantages, vigorously carry out research and development activities on intelligent control technology, driverless technology and transportation traction transmission technology, promote the application of new technologies and promote enterprise transformation. On this basis, the school and the enterprise should establish a close two-way interaction relationship, build a school professional group around the transportation equipment manufacturing industry cluster, carry out skill training, teacher training, and teaching resource construction activities for the school, and the school provides staff training and technical consulting services for the enterprise to achieve collaborative education and development.

3.2 Build a university enterprise deep integration alliance and practice base

In order to promote the deep integration of schools and enterprises, the school should cooperate with brother colleges and local leading enterprises to jointly establish an industry education integration alliance that is open and sharing, virtual and real, and expert collaboration. Based on the support of schools, enterprises and industry resources, the three parties can jointly establish a practice environment based on virtual learning+artificial intelligence from the perspectives of talent training, social services, education training and industrial development. School and enterprise experts can jointly develop practical teaching projects, teaching standards and training resources to provide conditions for promoting the development of industry technology and improving the quality of school practical teaching.

3.3 Build a platform for technical innovation and transformation of transportation equipment

In order to rapidly transform and apply technological innovation achievements, both schools and enterprises should take the transportation manufacturing specialty as the main body, build a technological innovation and transformation platform, gather the personnel of application enterprises, manufacturing enterprises and schools, jointly process technologies and related resources, and introduce the latest standards, technologies and processes into enterprise production. In this way, it can not only form operation manuals, maintenance plans, technological processes and operation standards that conform to the times, but also convert these resources into professional teaching resources to ensure the consistency of industrial technology content and teaching content. At the same time, the school should investigate the product demand and operation of the enterprise, and update the teaching content in a timely manner.

3.4 Build "1+X" enterprise technology service platform

Based on the local transportation equipment manufacturing industry chain, the school can invite well-known enterprises and leading enterprises to jointly build an enterprise service platform and a "1+X" training base from the perspective of technology, products and services. In this way, the school can optimize the training system of skill level certificates in combination with the types of talents lacking in the enterprise, and better promote the combination of "1+X" certificates and professional education.

4. Cultivation of talents in transportation equipment manufacturing from the perspective of integration of production and education

4.1 Focus on industrial connectivity and reconstruct professional teaching framework

First, establish a professional platform for resource sharing. When building the professional curriculum system, the school can implement platform courses, build a curriculum pattern of curriculum co construction, production and learning exchange, and resource sharing, and reconstruct the professional teaching framework. For mechanical tolerance fit and technical measurement, mechanical drawing, mechanical engineering foundation and other courses, full-time teachers and enterprise tutors can optimize basic modules and professional modules according to teaching content and production requirements, combine traditional basic teaching with on-site student resources, promote the connection between basic knowledge and core content, and stimulate students' interest in learning. Secondly, build professional core courses for industrial connectivity. Both the school and the enterprise should adhere to the principle of professional docking industry, connect the professional core curriculum with the enterprise post content, integrate the front-line production standards and norms into the curriculum, and create

Featured courses with service posts to promote the construction of professional core courses. In addition, practical training courses promoted by schools and enterprises shall be constructed. Practical training courses are important aspects to help students understand and transform knowledge. Both schools and enterprises can strengthen the relationship between enterprise tutors and full-time teachers, develop practical training courses with the help of real working environment, integrate production operation processes and projects into the courses, and set up craftsmanship modules. At the implementation level, enterprise tutors can adopt the method of master leading apprentice to let students solve practical production and operation problems.

4.2 Implement collaborative education and reform professional teaching mode

First of all, teachers should reasonably choose teaching content based on the principle of "industry development and post applicability". By analyzing the international development process of transportation equipment manufacturing talents and the development trend of the transportation industry, the traditional transportation theories and advanced theoretical knowledge are integrated to form teaching contents that meet the requirements of the post. According to the advanced teaching content, the school and the enterprise can jointly develop practical handouts and vigorously promote the project-based training method. Secondly, explore online collaborative education mode. Relying on the campus network, the school can introduce and transform high-quality resources of enterprises, build a resource library based on the transportation equipment manufacturing specialty, and build an interactive platform for independent learning and auxiliary learning for professional students. On the platform, the school can invite enterprise tutors and full-time teachers to work together to develop high-quality online and offline courses and record teaching videos with enterprise production and management. In teaching activities, full-time teachers can use remote teaching methods to invite enterprise tutors to carry out case teaching and demonstration teaching activities to bring enterprise knowledge to students. In addition, both schools and enterprises should actively transform and apply teaching and research achievements, transform advanced theories into teaching practice, design work scenarios and practice cases related to enterprise work, and design project tasks around the achievements, so that students can exercise their scientific and technological innovation and practical application ability while learning professional knowledge.

4.3 Pay attention to the joint construction of schools and enterprises, and build a comprehensive training base

In the fierce social competition, enterprises pay more attention to whether talents have professional ethics, key abilities and professional abilities, which need to be cultivated in the real service and production environment. First of all, according to the development needs of the transportation equipment manufacturing industry, the school can cooperate with enterprise personnel to strengthen the construction of the school training base. In the construction process, the school can refer to the suggestions of enterprise personnel to build a comprehensive

traffic manufacturing training area, industrial robot automation training area, CNC machine tool processing area, and intelligent manufacturing training base, and introduce enterprise production and training projects. In terms of the operation mode of the training room in the school, the school and enterprise can implement the studio training mode, invite enterprise tutors to cooperate with full-time teachers to carry out daily training tasks, and organize students to participate in training and expansion activities. Secondly, based on the social industry and industry structure, the school should strive for the support of well-known enterprises to build a number of industry education integration training bases for coordinated development, so that more students can go out of the school to understand the latest technology, process and standards. In addition, relying on the integration platform of production and education, both schools and enterprises should build off campus training bases. At present, the training cost of transportation equipment manufacturing related majors is relatively high, and it is difficult for students to understand the cutting-edge production technology and environment. In this regard, the school can regularly arrange teachers and students to go deep into the enterprise to understand and observe real projects and clarify the requirements of the enterprise for talents. Among them, enterprises can introduce specific corporate culture and job skills to teachers and students according to different job requirements, and lead students to the enterprise work and production front.

4.4 Deepen the integration of production and education, and create excellent teachers

Excellent teaching team is the guarantee to improve the quality of talent training. First of all, in order to build an excellent teaching team, the school should deepen the integration of industry and education, invite enterprise personnel and industry personnel to participate in professional construction, curriculum development and teaching reform, and cultivate the teaching ability of enterprise tutors by strengthening the construction of teachers' ethics and style. Secondly, based on the demand of the society for transportation equipment manufacturing talents, both schools and enterprises can build a collaborative innovation mechanism of teaching, research and technical skills, education and teaching, and improve the professional quality and industrial quality of teachers through academic exchanges and scientific research activities. Third, vigorously carry out international cooperation. Based on the development opportunity of the "Belt and Road", the university should actively participate in international projects, strengthen cooperation with international enterprises, and expand employment channels in the student market. By giving full play to the advantages of "Internet+" technology, the school can, with the support of relevant departments, integrate the power and resources of integration of industry and education, and vigorously cultivate information-based and international talents. Based on the environment of network interconnection and resource sharing, the school can communicate with various enterprises in a timely manner, continuously update and introduce high-quality educational resources, and invite teachers with international perspectives to teach.

5. Conclusion

To sum up, to further promote the integration of industry and education, and to vigorously cultivate transportation equipment manufacturing talents are related to the process of industrial transformation and development, and the quality of higher vocational talent training. Therefore, the school should pay more attention to ideology, combine specialty with industry, build a teaching system of transportation equipment manufacturing specialty based on school enterprise cooperation and integration of industry and education, give play to the advantages of enterprise resources, and improve the social service ability of the school. Specifically, both schools and enterprises should, on the premise of building a collaborative innovation center, a practice base, a technology transformation platform, and a "1+X" service platform, build a dual education talent training model by restructuring the professional framework, reforming the professional teaching model, building a comprehensive training base, and creating an excellent teacher team, so as to cultivate composite talents that meet the needs of transportation equipment manufacturing posts.

References:

- [1] Yang Wen, Tong Zhongwen, Huang Jianfeng. Construction of the professional curriculum system of the rail transit equipment manufacturing professional group under the background of industry education integration [J]. Science and Technology Horizon, 2021 (30): 101-102

[2] Jiang Lizheng, Cao Huanya, Yu Yang Innovation and Practice Research on the Integration Mechanism of Industry and Education in the Major of Higher Vocational Equipment Manufacturing -- Taking the Numerical Control Technology Major of Zhejiang Electromechanical Vocational and Technical College as an Example [J]. Science and Education Guide - Electronic Edition (first ten days), 2021 (2): 19-20

[3] Yang Wen Construction of talent training mechanism for coordinated development of professional clusters and regional industrial clusters in the context of industry education integration -- Taking Hunan Railway Vocational and Technical College as an example [J]. Science and Technology Horizon, 2021 (26): 100-101

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