Research and Practice on Construction of a New Generation of Information Technology Specialty Based on the Demand of Intelligent Manufacturing Industry

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ABSTRACT

This article focuses on the transformation and upgrading of the intelligent manufacturing industry. The integration of the two needs of a new generation of information technology professionals and training of "T-type" composite technical skills personnel who are proficient in IT, familiar with business and equipped. To study the mechanism of labor education, education and co-operation, "innovation and implementation of personnel training mode of" dual element and project carrier "of school-enterprise cooperation, optimization of knowledge transfer, skill training, innovative practice, quality improvement and value accumulation" five in one Training system and building a "platform + direction + project actual combat" curriculum system, and promote the implementation of "professional basic ability + post special ability + post comprehensive ability" ability to progressively practice teaching system, the implementation of "online + offline +" Hybrid teaching model, build “base + studio" teachers ability to enhance the platform to build first-class training conditions, enhance scientific research ability and social service capacity and other content, improve the quality of personnel training, service regional economic development.

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KEYWORDS

A New Generation of Information Technology, Professional Group; Personnel Training Model, Personnel Training System, Practical Teaching System

INTRODUCTION

In recent years, with the vigorous development of new technologies and new formats such as smart manufacturing, cloud computing, internet of things, mobile data, big data and virtual reality, a new generation of information technology industries has also accelerated its transition to service-oriented, networked and converged The direction of development. The new generation of information technology industry has not only increased its relevance and interaction with other industries, but also integrated more deeply into all aspects of social life. The new generation of information technology revolution represented by artificial intelligence, internet of things, cloud computing, big data, virtual reality and information security has become the focus of global attention and one of the industries with the fastest market expansion and has become a new growth point of the world economy, as[1]. Therefore, all countries in the world have successively introduced industrial policies and vigorously promoted the development of a new generation of information technology industries, as[2].

"Made in China 2025" and "Guiding Opinions on Actively Promoting" Internet + "Action" and other documents to promote the combination of mobile Internet, cloud computing, big data, Internet of things and other modern manufacturing industries to integrate the Internet and the Internet through a new generation of information technology All industries, including traditional industries, should be integrated to enhance the level of industrial development, enhance the innovation capability of various industries and build new advantages and new momentum in economic and social development.

Shandong Province has vigorously promoted the in-depth integration of informatization and industrialization, fostered the development of a new generation of "new-generation information technology" industries and strengthened the support and support of qualified personnel. Our province is a large province of electronic information industry and manufacturing industry with the advantage of good foundation, scale, precedence and agglomeration in technology research and development, industrialization, market application, human resources and new industry cultivation. "Outline of the Thirteenth Five-Year Plan for National Economic and Social Development of Shandong Province", "Shandong Province Platform for Action 2025 Made in China", "Shandong Provincial People's Government General Office on Printing and Distributing Shandong Province Action Plan for Industrial Transformation and Upgrading (2015-2020), it mentioned that cultivating and developing [4] new emerging industries such as "a new generation of information technology", using a new generation of information and communication
technologies to transform traditional industries, developing new industries, speeding up industrial restructuring and upgrading, and constantly creating new models of new formats. Construct high-end software, cloud computing, big data, next-generation network and communication, Internet of Things, industrial manufacturing and other products and fields into the industrial R & D, production, service and management and other links, build applications such as Internet of Things, cloud computing, big data Innovation platform, strengthen the support of personnel support, focusing on the construction of high-level and highly skilled personnel to strengthen the introduction, training and use of qualified personnel [5].

A new generation of information technology as a strategic emerging industries, industrial technology changes the fastest, most innovative, involving the most technical areas, the demand for talent is diverse. As a new direction of industrial restructuring and upgrading in China, smart manufacturing has great demand for T-type composite technology professionals who are proficient in IT technology, are familiar with the business and are familiar with the equipment. Strong demand for talent and the government's attention, put forward new requirements for training a new generation of information technology skills and skills [6], will also promote faster, better development of a new generation of information technology industry. A new generation of information technology industries need a large number of proficient in IT technology, familiar with the business, understand the equipment, comprehensive quality, with independent learning ability of complex technical talent, as[3].

In short, the lack of a new generation of information technology professionals has become one of the problems that constrain the industrial transformation and upgrading of China and Shandong Province at this stage. As a knowledge-intensive and technology-intensive industry, a new generation of information technology industry needs a large number of technical and technical personnel who are engaged in the industry and need a certain number, structure and quality of personnel to support the development of the industry. The new generation of information technology industry, human resources reserves, employment training and employment status of the industry, determines the level of employment in the industry and potential. Strong demand for talent and government attention, will promote a new generation of faster and better information technology industry, as[3].

Focusing on helping the transformation and upgrading of the smart manufacturing industry in Shandong Province and promoting the integration of the two industries, the professional group focuses on "Made in China 2025" and "Internet + Actions" and is deeply integrated into the "Belt and Road" strategy. It aims at mobile Internet, Cloud Computing, Big Data, Virtual Reality, Cyberspace Security, Internet of Things, and Intelligent Manufacturing. Focusing on the next generation of information technology applications, the core of software technology is core technology. Mobile application development, computer network technology, Internet of Things application technology, Application technology, digital media application technology based on the expansion of cloud computing, big data, virtual reality,
cyberspace security professional direction. A new generation of information technology professional group as shown in Figure 1.

![Figure 1. A new generation of information technology professional group composition.]

DEEPEN THE SYSTEM OF EDUCATION AND LABOR COOPERATION AND EDUCATION SYSTEM

We will deepen the integration of production and teaching, and the cooperation between schools and enterprises, so as to further improve the system and mechanism for diversified and coordinated running of schools and schools and strengthen the service capabilities of professional groups. And Zhongan United Group, the wave of the Group to build a mixed-ownership nature of the two colleges. Relying on the construction of computer professional education in Shandong Province Steering Committee, the establishment of a new generation of information technology professional group construction alliance. Shandong Province to complete the integration of school-run demonstration model colleges and universities identified projects. Exploring the professional group credit system, flexible academic system reform. Establish professional dynamic regulation and professional diagnosis and reform mechanism.
INNOVATION AND IMPLEMENTATION OF "SCHOOL ENTERPRISE DUAL, PROJECT CARRIER" PERSONNEL TRAINING MODE

Deepen the "school-enterprise dual element, project carrier" personnel training mode. Together with the industry and cutting-edge enterprises, the company adheres to the concept of building a professional group of school-enterprise cooperation based on the principle of "school-enterprise duality" to realize the sharing and integration of teachers, management and evaluation, education and certification, teaching implementation, enrollment and employment, and curriculum resources. Adopting the "project carrier" talent training mode, the introduction of real business projects to schools, business engineers and college teachers, students together to complete the project development, and then into a teaching project, the implementation of project-based teaching, strengthen the comprehensive training links to ensure that Teaching theory and practice of organic integration, work together to create "T-type" composite technical skills talent. Promote international cooperation in teaching, construction of software technology international cooperation in running a school. "School-enterprise dual, project carrier" personnel training mode shown in Figure 2.

FIVE TALENTS TRAINING SYSTEM CONSTRUCTION

To Lideshu people as a fundamental, to improve the quality of personnel training as the core, the concept of educating people, practice education, cultural education concept into the curriculum system construction, practice teaching system implementation, cultural construction. Construct a professional group course system of "platform + direction + project actual combat". Promote the implementation of
"professional basic ability + post special ability + post comprehensive ability" ability to progressively practice teaching system. Improve the innovation and entrepreneurship practice education system to promote students' ability to innovate and start a business. Optimize quality training system to promote students' physical and mental health, as [4].

(1) Build "platform + direction + project actual combat" professional group curriculum system. Based on the typical jobs, select typical work projects scientifically, starting from post requirements and people's all-round development requirements, to build a professional group curriculum system. Integrate the concept of educating people into the construction of the entire curriculum system, practicing the concept of "thinking and managing courses" to "thinking of courses", strengthening the education of all courses and leading the value through professional courses, practical courses and their educational activities in the formation of curriculum teaching "big thinking" a new pattern.

(2) Promote the implementation of "professional basic ability + post special ability + post comprehensive ability" ability to progressively practice teaching system. Follow the principle of "from single to comprehensive, from beginner to senior, step by step", connect typical professional work groups and working process of professional groups, integrate vocational skills and professional accomplishment education, and promote professional groups to implement practical teaching system. Will practice the concept of education into practice teaching system throughout the implementation process. Through the organization of students to participate in the military training education, comprehensive training and other practical business activities, so that students in practice activities by education, talent, establish the correct values of life and enhance social responsibility.

(3) Perfect innovation and entrepreneurship practice education system, improve students' ability of innovation and entrepreneurship. Form a "one core, four platforms, ten support" innovation and entrepreneurship practice education system to enhance students ability to innovation and entrepreneurship. Relying on innovative education, the key is to cultivate entrepreneurship as the core, to build a comprehensive system of innovation and entrepreneurship, for the professional training of outstanding practical talents. Driven by four platforms: Innovation and Entrepreneurship Education Platform, Innovation and Entrepreneurship Simulation Practice Platform, Innovation and Entrepreneurship Competition Actual Combat Platform and Postdoctoral Innovation and Entrepreneurial Base Platform, they lay a solid theoretical foundation for innovation and entrepreneurship, and enrich students' experience of innovation and entrepreneurship. Based on ten supports of professional technical support, innovation and entrepreneurship guidance, career planning guidance, comprehensive literacy training, professional associations, training both inside and outside the school, campus entrepreneurship simulation, professional innovation and entrepreneurship competition, cross-disciplinary innovation and entrepreneurship competition, and base project incubation, Innovation and entrepreneurship, to create public entrepreneurship.
(4) The concept of cultural education into the culture of professional groups in building, to create sophisticated pragmatic, committed to innovation, the pursuit of excellence in the professional group culture. Professional group culture infiltration in the construction of professional groups, construction of training facilities, curriculum development, teaching material development and teaching reform, the professional groups to enhance the connotation, the formation of a professional group of spiritual culture, material culture, institutional culture, Professional culture and humanities culture, to cultivate students a good occupation spirit play a positive role.

MODERN VOCATIONAL EDUCATION CURRICULUM CONSTRUCTION AND TEACHING REFORM

Relying on Tsinghua University network teaching platform is the new development of "online, offline, career-oriented" modern vocational education curriculum. Implementation of the "online + offline + workplace" hybrid teaching model reform, develop students' ability to learn independently. Make full use of information technology to realize the in-depth integration of information technology and education and teaching, and implement the reform of "online, offline and career-oriented" hybrid teaching mode. Online teaching and face-to-face classroom integration design, teachers’ pre-recorded teaching micro-video and other curriculum resources uploaded to the teaching platform; online use of modern vocational education platform to learn, students can learn according to their own needs and learning progress, to meet individual training demand. The course is mainly for students to conduct group discussion, project actual combat, task study, display exchange, homework and evaluation activities. The teachers are mainly responsible for answering questions, organizing activities. The "project lead, task-driven" teaching mode organizes teaching, Design and organize teaching process. "Work-oriented" features into the online and offline links, online mainly reflected in the teaching content, select the most advanced technology companies, real projects, case columns, industry standards and other enterprises as a knowledge point; offline select enterprise workstations, School workshops, off-campus training bases and other workplace environment, according to the real case project design classroom tasks, the implementation of action-oriented teaching, guiding students or independent or group to complete the task, project or operation, and in accordance with the standards of the enterprise to complete the implementation of the evaluation, as[5].

HIGH LEVEL OF TEACHING STAFF BUILDING

The school-enterprise build "dual-type" teacher training and training base, teacher's studio; implementation of the "dual professional leader" system; the introduction of high-end talent, training 30 backbone teachers to enhance the overall quality of teaching team; strengthen young teachers to train and establish youth
Teacher mentor system; attracting industry and business experts to set up part-time teachers' library; strengthening teachers' training abroad and introducing overseas high-end talents and teachers to build a "leading teacher, leading technology, integration of specialized departments, well-known domestic and international promotion" High-skilled, high-quality, high-level international teaching team.

FIRST-CLASS INTERNSHIP TRAINING CONDITIONS

Focus on a new generation of information technology hot spots, training "T-type" composite talents needs, build provincial vocational training base. Newly built and rebuilt 11 experimental training rooms, developing more than 60 training projects. New 16 off-campus training base will provide students with a real IT business environment. Improve practice management base training mechanism. Give play to the leading role of the training base construction on the upgrading, structural adjustment and technological innovation of the intelligent manufacturing industry so as to promote the coordinated development of the new generation of information technology industrial system and modern vocational education system in the region.

RESEARCH AND SOCIAL SERVICES CAPACITY BUILDING

Relying on business experts, part-time teachers and Shandong Province, smart manufacturing public training base, built provincial-level application technology co-innovation center, service regional economic restructuring and industrial restructuring and upgrading. The goals are the introduction of industry-renowned technology experts, the establishment of two master skills studio to create first-class research and innovation team and technical services team to further enhance the level of research and development and technical service capabilities for the regional industry to carry out research, technical services and social training.

CONCLUSIONS

The lack of a new generation of information technology professionals has become one of the problems that constrain the industrial transformation and upgrading of China and Shandong Province at this stage. In view of the demand for a new generation of information technology talents in fields such as Internet of Things, big data, cloud computing, cyberspace security, mobile application development and virtual reality, it is proposed to develop "T-type" composite technology skills that are proficient in IT, familiar with the business, and equipped Researching the training model of "dual element and project carrier" of school-enterprise; constructing the "five-in-one" personnel training system; studying the construction of modern vocational education curriculum and teaching pattern reform; Studying a high-level
faculty building mechanism and other contents will effectively stimulate the enthusiasm and initiative of students, improve the quality of personnel training, create a high-level faculty, and build a first-class practical training conditions. Therefore, it is of great theoretical research value.

Through the analysis of the new generation information technology industry background and the demand for talents, we have innovated and implemented the talent cultivation mode of "duality of university and enterprises, project carrier", and constructed the "five in one" personnel training system, curriculum system and practical teaching system, innovation The implementation of "online, offline, workplace" hybrid teaching reform, for our province to learn from vocational colleges and guide colleges and universities to conduct professional group construction research and practice, at the same time promote the smart manufacturing industry in Shandong Province Upgrading and development, promoting the integration of the two cultures and serving the regional economy have important practical significance and popularization and application value.

REFERENCES