The Innovation and Practice of the Training Mode of Computer Network Technology Professionals in Connecting Middle and Higher Vocational Education Based on “Three Emphases and One High Requirement”

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Abstract. The rapid development of information technology has made the five-year continuous training mode of secondary and higher vocational schools more and more prominent. This paper takes the computer training of Shanghai Xingjian Vocational College and Shanghai North Vocational High School as the basis of practice. Students study for a total of five years, including the first three years in secondary vocational schools, the next two years in higher vocational colleges, and graduated from higher vocational colleges. In order to explore new measures to penetrate the talent training model, the professional construction was implemented through the integration of talent training programs, curriculum, teaching resources and quality evaluation. At the same time, it also made a useful attempt for the reform of this training model.

The Necessity of the Connecting Middle and Higher Vocational Education

At the Third Session of the 12th National People's Congress, Premier Li Keqiang proposed in the government work report: Formulate an "Internet +" action plan to promote the integration of mobile Internet, cloud computing, big data, Internet of Things, etc. with modern manufacturing, and promote e-commerce, The healthy development of industrial Internet and Internet finance has led Internet companies to expand into the international market. ”

In recent years, the demand for network technology in emerging fields such as Internet+, cloud computing, Internet of Things, and big data has grown exponentially. According to the statistics of talent network, the demand for talents in the Internet field in the first quarter of 2015 has ranked first in the industry, and The demand for online talents in Shanghai far exceeds the output of skilled talents in higher vocational colleges, and the market is no longer pursuing high education.

With the rapid development of information technology, the traditional "3+3" training mode has become more and more conspicuous. The students in secondary vocational colleges have weak knowledge base, limited ability to accept, and skills training cannot meet the needs of enterprises; higher vocational colleges Due to the diversification of students, it is necessary to build a curriculum system based on zero foundation, which makes the three students have repeated knowledge, limited skills, and the cultivation of high-end skilled talents. Therefore, relying solely on the training of talents in secondary vocational schools and higher vocational schools cannot meet the needs of Shanghai's rapidly developing information industry. Higher vocational colleges need to intervene in the integrated design and training program at the secondary vocational stage, adopting a five-year system of training. In order to more effectively cultivate high-end skilled network talents who are adapted to the development of information technology.

Professional Positioning and Talent Training Goals

Combining the two schools' own situations, the company is specialized in transporting high-end skilled talents that are urgently needed in the mainstream areas such as the Internet+, cloud computing and other areas that adapt to the development of information technology and industrial structure for the regional economy and the Shanghai information industry.
Five-year consistent computer network technology professional training can be engaged in network management and maintenance, website development and design, database management and maintenance, three job groups related employment, such as the establishment, management and maintenance of local area networks, network equipment installation, configuration and Debugging, network system planning and implementation, for computer and network technology applications, can be engaged in small and medium-sized network and website planning and design, website front-end and background program development, database management and maintenance, and expand to the frontier technology field (cloud, high-quality, highly skilled personnel in computing, Internet of Things, mobile terminals, big data, etc.). The career development path diagram of computer network technology is shown in Figure 1.

Figure 1. Computer network technology professional career development path map.

Talent Cultivation Model Innovation and Measures of “Three Emphases and One High Requirement”

Talent Training Program Design Integration. Promote school-enterprise cooperation, deepen the integration of production and education, and innovate talent training models. Taking the "integration of knowledge integration, the spiral of ability training, and the whole process of professional literacy" as the innovative ideas, relying on the regional vocational education group, the school and enterprise jointly explore and implement the talent training mode of "heavy application, heavy technology, innovation and high quality". The talent training program is built with the competency standard as the main line, and the "three-in-one" teaching system of theoretical teaching, practical teaching and innovative teaching is constructed horizontally. The professional basic module, vocational technology module, professional core module, comprehensive training module and occupation are constructed vertically. Expand the module system of the “six modules” of the module and quality development module. Innovate and practice in the teaching content, teaching methods, teaching assessment, innovation and entrepreneurship education, and post-training.

“Emphasis on application”—The company participates in the selection of teaching items, teaching process, evaluation and teaching plan in the whole process; students complete the cognitive internship week in the first semester, complete the engineering and internship in the sixth semester for ten weeks, and complete the enterprise internship in the tenth semester More than three months, understand the business operation mode, participate in the implementation of enterprise projects; teachers and students jointly develop enterprise commissioned projects, set up community to carry out network maintenance and computer maintenance for the teachers and students of the two schools and surrounding communities; select outstanding students to participate in the network maintenance of the school network management center, A spiral of capacity development in practice.

"Emphasis on Technology"—With the help of the internal and external training bases, the construction of a "full process, integration, multi-module" practice education system. The first to
fourth semesters focus on the cultural foundation and vocational basic ability training. The fifth to seventh semesters focus on the cultivation of professional core competence, and the seven to nine semesters focus on cultivating comprehensive and expanding abilities. Before the transfer, all of them passed the examination of the intermediate vocational qualification certificate. According to the needs of the enterprise and the training conditions of the school, the original personnel insurance certificate was changed to the enterprise certification certificate H3CNE. The teaching implementation takes the enterprise project as the carrier and adopts the “practice-theory-practice” three-stage teaching mode. Give full play to the main role of students. From the eighth semester, we will implement teaching in three major directions, realize the integration of knowledge, and focus on cultivating skilled talents who can adapt to employment and have sustainable development capabilities.

"Emphasis on Innovation"--implementing the spirit of innovation and entrepreneurship and comprehensively promoting the "six-one" engineering education. In the course system, we joined the "Entrepreneurship Training Camp" and "E-Commerce Application", relying on the innovation and entrepreneurship incubator of college students, and concentrating on cultivating innovative and entrepreneurial talents.

"High Quality"--In combination with the training of our colleges and universities, "Introduction to self-improvement of self-improvement", this major regards Lideshu people as the fundamental task of educating people, in order to promote the all-round development of students. Incorporating the comprehensive quality of students as an important measure of talent cultivation into the talent training program is regarded as an important part of the talent training system. The “Quality Development Archives” is added to the training program, and the comprehensive quality of students is comprehensively cultivated and examined from the modules of academic technology, community activities, public welfare activities, social practice, innovation and entrepreneurship, and competition research, so as to achieve full professionalization. When the students graduate, the “Quality Development Archives” will be loaded into their files as an important basis for the employer to comprehensively evaluate the overall quality of the students.

Establish a goal of strengthening the cultural foundation, broadening the professional field, and improving the practical ability. With the implementation of the continuous training of secondary vocational colleges and higher vocational colleges as the link carrier, the integrated design, the original secondary vocational and higher vocational education independent curriculum system is effectively integrated and rationally connected.

Formulate skills assessment criteria that adapt to market needs and students choose their own career direction. In order to provide students with independent choice of space, the certificate of the Ministry of Human Resources and Social Security is taken as a mandatory test. The enterprise certification certificate is selected by the students to choose H3C, Huawei, Ruijie, Cisco, etc.

Integration of Curriculum System. Starting from the characteristics of the students' psychological and cognitive development, the courses are set up in stages, and the courses can be fully connected. The curriculum of the three major positions and the six major vocational modules are constructed, as shown in Figure 2. Three business internships are carried out throughout the course of the course. The courses of the vocational and technical modules are more focused on the basics, highlighting the pertinence of the follow-up core courses; the professional core module improves the teaching objectives of the course, and the teaching content focuses on the real cases of the cited enterprises, highlighting “Re-application” in the “triple-high” training mode; the career development module starts the direction-oriented teaching for students from the eighth semester, and expands the cutting-edge technologies of the three major positions, including virtualized cloud computing, mobile terminals and big data. Etc., highlighting the "heavy technology" in the "three-up-one-high" training mode, and adding "entrepreneurial training camp" and "e-commerce application" in the elective course, cultivating and encouraging students to innovate and start a business, highlighting "three highs and one high" "Re-innovation"; quality development module, innovative implementation of quality expansion files, from the aspects of innovation and entrepreneurship, academic technology, public welfare activities, social practice and other aspects
to cultivate and examine the comprehensive ability of students, highlighting the "high quality" in "three weights and one high".

Compared with the traditional “3+3” training mode, this professional has reduced the number of professional basic courses in general, avoiding the repetition of knowledge points; keeping the professional foundation of students at the same starting line, avoiding the teaching brought about by the diversification of traditional higher vocational students. Difficulties; improve the training objectives of professional core courses; keep up with the development of the industry, broaden the professional direction, and increase the corresponding courses for database administrators, cloud computing engineers, and IoT engineers. Therefore, when students graduate, their skills are mastered and solid, they can adapt to the needs of various job positions, expand their employment prospects, and have good employment prospects.

Integration of Teaching Resources Construction. Teachers and teachers exchange, special and combined, joint teaching and research. The two institutions that have implemented the continuous training have jointly established the professional steering committee and the joint teaching and research group to participate in the process of talent cultivation. The joint teaching and research group regularly implements the revision of the professional talent training program every year, and regularly conducts teaching exchange activities. The teaching team broke through the boundaries of the school. A number of higher vocational college teachers participate in the teaching process of the lower grades, participate in the training of professional students early, and understand the situation of students in order to carry out the development of teaching materials more effectively. The establishment of three professional module collaboration groups, network management and maintenance, website planning and design and database management and application are respectively responsible for the three leaders of higher vocational schools. The professional leaders of the two schools regularly organize teaching and research activities, and each module exchanges teaching conditions, student dynamics, and common issues to solve problems. The establishment of a team of teachers with a combination of special and reasonable structure, the part-time teachers of the company account for more than 40% of the total class hours. Formulate professional leaders and professional teacher training programs, and strive for 100% of “double-type” teachers. Within five years, all full-time teachers will go to work for more than six months.

"Internet + teaching", school and enterprise jointly develop three-dimensional textbooks suitable for professional core courses. Established a medium and high vocational curriculum development and textbook writing committee and curriculum development and textbook writing team to jointly develop four series of eight textbooks suitable for the medium and high vocational training model. Each textbook is led by a higher vocational college teacher. College teachers and related corporate
engineers participated in the compilation and focused on citing cases from companies. The textbook format breaks through the traditional paper textbooks, and builds various forms of teaching resource libraries such as electronic lesson plans, e-books, CAI courseware, test questions, and online courses. Through the Internet, the resources are shared by websites, APPs, and clouds.

Improve the school, expand off-campus, inter-school sharing, and follow the industry development to create a training base. The two schools have a total of 800 square meters of professional training rooms on campus and equipment investment of 7 million yuan. It has a computer maintenance training room, a network security training room, a comprehensive wiring training room, a network engineering training room, and a network and management center to meet the professional training requirements. Jointly build experimental training and training assessment bases with more than ten enterprises, including network interconnection training room, virtualization and cloud computing training room, computer network technician training base, and IoT training base.

Visit and interact, multi-level, all-round integration. Strengthen inter-school exchanges and visit interactions so that students can learn about the campus environment and learning places that will learn life as soon as possible, conduct lectures, familiarize themselves with the post-learning courses of the majors as well as future employment prospects, and share the training room inside and outside the school. Through-training mode has been implemented, and multi-level and all-round integration has been achieved.

Quality Management Evaluation Integration. Improve the quality control system, develop the information platform, and use the information normal data to start the quality monitoring management from the new source. Implement teaching patrols, supervise lectures, and evaluate students' teaching methods to strengthen teaching quality management. The original evaluation model of “one year screening, three-year transition, five-year graduation”, in the implementation process, it is found that if the screening policy is no longer implemented after one year of screening, the learning motivation of students under the long-term system is difficult to maintain. In addition, the number of failing subjects exceeds three subjects per year, and the transfer test is carried out at the end of the secondary vocational stage, and multiple screening schemes coexist.

Promote diversified evaluation methods. Exploring the reform of the dual-certificate, the process assessment, the competition test, the project development and other assessment methods, and the reform of the assessment mode to promote the mastery of students' practical skills.

Summary

The two colleges have been through continuous training since 2013. At present, the first students are about to enter the higher vocational level, and have achieved good teaching results in the exploration of innovation and practice. In the future, they will be based on the analysis of the previous experience. With the development of the industry, we will explore new measures for the cultivation of high-level talents in computer network technology.

Optimize talent development programs. Comply with market dynamics, strengthen inter-school exchanges, reasonably link the six modules of the curriculum system, improve curriculum standards and training outlines; implement and improve the "heavy application, heavy technology, innovation and high quality" talent training model. Exploring the implementation of double-certificate integration, developing order training with enterprises, fostering studio model training, and mentoring mode; improving management mechanism and quality evaluation system. The information platform will be implemented as soon as possible to realize the unified management of student information. The professional steering committee and the joint teaching and research group are strictly institutionalized, the quality monitoring is complete, and the evaluation system is diversified. Emphasis is placed on teacher training and teaching and research. Through business training, production practice, teaching competition and other ways to improve the teaching level of teachers; expand the teachers outside the school, the part-time teachers of the enterprise will take 50% of the total class time within five years; complete three special topics for middle and high
vocational education, and build four modules. Eight three-dimensional textbooks provide four technical services for enterprises.

References


