New Teaching Methods of Electronic Specialty Practice Courses under the Master-Apprentice System

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Abstract: With the development of society and economy, communication electronic technology has been widely used in various fields, which requires universities to carry out related education reforms to meet the needs of talents and technology in various fields of society. With the continuous progress and development of this field, many studies of secondary vocational education have become more and more common. China urgently needs a large number of high-skilled talents, transforming from a large manufacturing country to a strong manufacturing country. As a research result on the training of similar talents abroad, China first proposed the establishment and implementation of a master-student electronics professional practice training system in China. Suggestions. At present, China's electronic communication industry urgently needs different types of compound talents for electronic communication applications. This article studies the new teaching method of electronic specialty practice course under the apprenticeship system. In this article, through the course survey of college teachers and apprentices, it was found that 12% of school experimental equipment can be used normally, 17% of schools are not yet available, 8% are satisfied with school investment, 20% are dissatisfied, and professional Teachers account for 21%, but the integrated teaching method has not been fully realized, and in-depth research and analysis are made from the current status of pedagogical and apprentice practice teaching and improvement strategies to achieve a "seamless connection between talent cultivation and social employers "It is necessary to reform the existing experimental teaching model and improve students' comprehensive quality and employment competitiveness. The construction and assumption of the teaching method and system for the practice of apprenticeship in the electronics specialty of schools in China are put forward preliminarily.

1. Introduction

The rapid development of science and technology, especially the development of electronic technology, has changed with each passing day. This places higher demands on our e-learning experience [1]. Experimental projects based on traditional content are severely separated from existing technologies and production and cannot meet the social demand for talents [2]. For example, in the field of electronic technology, a large number of integrated, digital, and intelligent devices are used to form circuits that are convenient and fast. We have rarely participated in electronics research before, and the experimental methods are relatively primitive. Once learning begins, students need to relearn and cannot adapt to the needs of the enterprise quickly [3]. The purpose of secondary vocational education is to train high-tech, talented and technically advanced personnel who can meet the needs of production, service, management and other aspects [4]. The apprenticeship of mentoring system is a very important part of the electronics professional talent training plan. The formation of the mentoring system for practical learning should be based on the combination of theoretical knowledge and the ability to apply professional technology, and the master with the apprentice can improve the apprentice's ability to apply technology, analyze and solve practical problems [5]. With the acceleration of China's industrialization process, the demand for talent is particularly important, especially in the application field. This not only plays a role in the theoretical verification, but also plays a very important role in ensuring the apprentice's future adaptability and ability. Must have the ability to independently analyze and solve knowledge,

master methods and work experience, so the apprenticeship training is an important part [6]. In the modern apprenticeship, the teacher-apprentice relationship exists in the cooperation between the school and the enterprise. The master is employed by the enterprise or school. There is no direct employment relationship between the teacher and the apprentice. It is the identity of master and teacher and apprentice in modern apprenticeship system that has changed from the traditional apprenticeship system and the characteristics of schools and companies involved in the process of skills transfer. The authority and responsibility of the apprenticeship process need explicit regulations and contracts Go to divide. In addition, in the modern apprenticeship, the relationship between master and apprentice is still a kind of interpersonal relationship. During the process of the master and apprentice interaction, there will be hidden ethical power-responsibility relationships in addition to the regulations. Combining the characteristics of the apprenticeship relationship between the traditional apprenticeship system and the modern apprenticeship system, it is concluded that China's current apprenticeship relationship comes from the master of the enterprise and the apprenticeship from the school to form an explicit right, obligation relationship based on both identities and based on emotion The collective name of the hidden power-responsibility relationship formed. Both the teacher and the apprentice take the contract agreement as the premise, the work skills transfer as the core, and based on their own identity, they should establish and enjoy relatively equal explicit and implicit rights and obligations. The relationship between the two will be affected by factors such as the time spent together, the number of masters and apprentices, and the way of teaching.

The experimental teaching of faculty and apprenticeships is a key link in the entire learning process and an important tool for cultivating students' innovative spirit and practical ability [7]. To improve the quality of training, train high-quality talents, and conduct talent education based on the existing problems in communications and electronics. The "seamless relationship" with social employers should reform the existing experiential learning model to improve students 'overall quality and employment competitiveness [8]. It must be conducive to the cultivation of students' ability to apply technology, analyze and solve practical problems The demand for talents, especially for application-oriented talents, is particularly urgent. Therefore, it is very important to construct, reform and improve the practical teaching system.

Electronics is the traditional field of electronic education in the field of vocational education. Over the years, the application of the electronics industry has attracted many graduates of electronics majors. These students are mainly engaged in front-line assembly and assembly. These personnel usually do not need much technical knowledge [8-9]. At the same time, with the rapid development of electronic technology, enterprises urgently need excellent technical talents and can carry out design innovation. With the strong development of national vocational education, many small middle schools have gradually become college-level professional colleges according to this trend. In order to realize the savings of the times, it is necessary to innovate and strengthen practical learning to ensure that schools and social occupations have the skills required, and to ensure that teachers and students are combined with practical workers [10-11]. This requires research and innovation in talent education programs, curricula, practices and learning.

2.Method

2.1 Master-Apprentice Electronic Practice Teaching Method

(1) Establishing a "dual teacher structure" of the faculty It is difficult for higher vocational teachers to change theoretical and practical teaching methods based on the knowledge and practical skills learned during pre-service training. Provide practical skills throughout your vocational education career. Most vocational teachers are assigned directly to higher vocational colleges after graduating from high school or university. Schools need to create a conducive environment and gradually improve the skills of these teachers to become "double teachers" with deep theory and rich experience in the shortest time.

(2) Encourage "open" experiential teaching mode. Open experimental learning enables students

to select experimental content, correct experimental steps, select tools and equipment, and process and analyze experimental results and experimental data. Gender It provides students with a space to think freely so that they can make the most of their knowledge and skills and play games. This will help stimulate students 'awareness and initiative, develop students' creative ability, and increase the speed of laboratory use.

(3) Create a comprehensive apprenticeship system for practical learning. The experience learning system focuses on training professional talents. When teachers design curriculum outlines, it combines the curriculum with each teaching experience, and then supplements and supports theoretical training. These mainly include: experimental teaching, practical training, post-training, etc. They are various forms of practical training according to the requirements of professional ability, professional spirit and professional quality, they can complement each other and perform different tasks. The development of practical teaching materials with characteristics of higher vocational education is an important part of the education system. The curriculum should reflect the following principles: Knowledge and technology are necessary and sufficient to train technically applied talents based on students' physical and mental development levels, focus on student capacity building, and reflect project-based learning models. It can promote development and provide development space for different students. Establish a strict evaluation mechanism. The evaluation of experimental results depends on the evaluation results, the usual results, the results of the experimental report, and the overall weight. In order to fully understand the importance of internships, students must conduct experimental evaluations of each course to qualify for scholarships and alumni qualifications. Reasonably arrange the internship time and combine with the actual training system to make reasonable arrangements for the relationship, content and teaching methods. : Class 1 ratio.

(4) Implementing the "dual certificate" system The "dual certificate" system means that when a vocational college student is studying at the college, he or she has obtained one or more vocational qualification certificates at the same time as obtaining a diploma after graduation. These vocational qualification certificates are recognized by the labor market, and also play a vital role in the employment of vocational students. Therefore, with the certificate examination, the interest of vocational students in practical training will be greatly increased, and students will have a broader adaptability. To a certain extent, it is also an innovation of traditional teaching models.

(5) The goal of strengthening higher education in school-enterprise cooperation is to provide hands-on, efficient, service-oriented and manageable front-line talents. Open school-enterprise cooperation is a key way to promote the integration of "industry-based research" and promote higher education. Enterprises play a unique and irreplaceable role in developing the comprehensive quality of students. Society and enterprises should make full use of higher vocational education, and they should deepen the links between cooperative education and deepen the form, content and level.

2.2 Methods for Improving the Quality of E-learning in Apprenticeship System

First, the trend of using electronic technology to further optimize course content continues to evolve, and society's demand for talent is constantly changing. The concept of modern education is gradually developing towards science. Therefore, the choice of educational content should be based on the needs of the community. Optimize the content of existing e-courses to provide structured lessons and scientific knowledge based on students' long-term development. At the same time, according to career choices, courses can be designed to improve the relevance and purpose of e-learning, make the courses more scientific and practical, and improve student learning.

Second, strengthen the use of teacher and apprentice teaching methods In order to improve the quality of applied e-learning, it is necessary to reform traditional teaching methods, strengthen the use of modern teaching methods, and gradually abandon teachers' chalk and textbooks. The "appropriate and sufficient" principle of irrigation technology reduces theoretical class hours, increases practical training time, integrates new knowledge and new technologies in a timely manner, and regulates new technologies of modern electronic science in the curriculum. Design automation (EDA), "overall technology application" and other courses; modern educational

technology application and training courses must be targeted, vocational courses must adopt modular teaching, and students' subjective initiative should be brought into full play. Horizontal communication encourages teachers to master project-oriented teaching methods for teachers and students.

Third, the establishment of a practical training system for teachers and students, a scientific and reasonable, relatively independent practice system is the basis for talent development and an important guarantee for achieving network application goals. Business development requires student "skills", and "skills" are the most basic requirements for students to study at school and are targeted to specific students. It is necessary for teachers to bring students to practice training. It is necessary to create a scientific and acceptable environment for the entire education system, with different career directions, practical courses and skills training programs, and increase students' elective topics. At the same time, in the process of cultivating students 'practical ability, it is also important to cultivate students' creative thinking and skills. Establishing a practical training system suitable for different career-oriented and application-oriented is the guarantee to achieve the goal of skill training. The use of talents is very important. The establishment of a scientific and reasonable practical training system and targeted, planned, and progressive training will help students to combine their hobbies and skills, develop motivation and initiative, and implement their own implementation. skill. In addition, the application of electronics is a broad specialty and focuses on a set of tasks rather than positions. Students are required to produce small electronic products for design, installation and commissioning.

3.Experiment

3.1 Electronic Data Acquisition and Communication Experience

The acquisition of information and the experience of electronic circuits in the exchange of teachers and students can help students understand the definition, principle and ability of collecting electronic circuits. In general, communication electronics can be allocated 48 hours, 1.5 credits per lesson, and only 20 practical elements. There are 16 design-oriented comprehensive experimental projects and 10 experimental projects that students need to do. By organizing science and acceptable teaching time and practice, students can develop independent learning and independent operation learning, and can optimize the state of integrated practice.

3.2 Computer Communication Experiment

The purpose of computer communication experiments is to develop students' implementation skills, use concepts, principles, and skills in the book, consolidate textbook content in the process of completing experience projects, and develop student experiences. Skills and application skills.

3.3 Communication Comprehensive Experiment

The main courses of communication electronics are signal and system, communication principle, digital signal processing, sound signal processing, single-chip microcomputer principle and application, microcomputer interface technology, fiber optic communication. The technology and principles developed in these courses change with the development of social science and technology. In the information age, the electronics industry is characterized by the provision of innovative and practical talents to society. With the rapid development of the information society, the demand for information is also increasing. Therefore, a comprehensive communication skills course should be optimized to develop practical skills.

4. Discuss

4.1 Experimental Results and Analysis

After years of exploring professional practice teaching, under the master-student teaching mode, students can not only quickly improve their hands-on ability, but also can complement project

teaching methods as a useful supplement to project teaching methods. Electronic technology currently offers a wide range of expertise in vocational courses, and most vocational courses are exemplary and validated. As we all know, many graduates have very weak practical abilities. After graduation, they cannot be alone for a long time, which causes a great burden on employers, and students' practical abilities cannot meet market requirements. The apprenticeship system allows students to fully participate in the planning of practical lessons, the formulation of training objectives, requirements, and preparation of training equipment. After the reform, the new curriculum of the apprenticeship system emphasizes that teachers, as mentors, must fully mobilize the subjective initiative of students, truly "teach" and serve "learning", and through cooperation with students, rely on students to take the initiative in activities, practice, cooperation, and communication. To achieve teaching tasks; this requires that we involve students as much as possible before class preparation, let students collect relevant materials, choose teaching content, and design learning methods. The relationship between teaching experience and improving students' practical skills is the key to improving the quality of vocational education and training. Through the investigation of the original curriculum, the electronics specialty curriculum can be set to 50 hours, 2 credits per class, including 25 experimental projects. Based on practice, students must do 15 experimental projects. See Table 1 for the optimized and integrated curriculum.

Table 1. Optimized integrated curriculum

Course Title	Experimental hours	Experimental project	Must experiment	Comprehensive Design Experiment
Communication Comprehensive Experiment	25	55	20	35
Communication electronic circuit experiment	50	25	15	20
Computer communication experiment	20/44	52	1	15

An investigation of the mentoring system of electronic professional practice through experiments found that 12% of the school experimental equipment can be used normally, 17% of the schools are not yet available, 8% are satisfied with the school investment, and 20% are dissatisfied , Professional teachers accounted for 21%, but the integrated teaching method has not been fully realized, as shown in Figure 1.

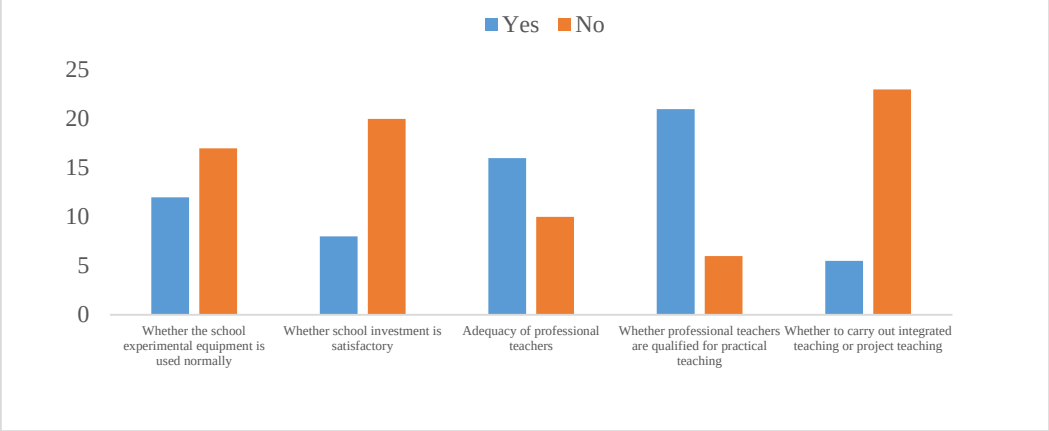

Figure 1. Statistics of practice survey

4.2 Measures to Address the Issue of Mentoring Electronics

(1) Develop teacher-apprentice teaching methods and improve students' practical ability

In school, the purpose of training is determined as "practical purpose", because it aims to train the students' theoretical knowledge, enhance students' practical ability, and develop students' practical ability and professional skills. When reforming teaching methods, teachers need to

improve the content and nature of teaching and practice of experimental learning, and develop students' innovative thinking and practical skills.

(2) Improve practical courses, increase experience and training intensity

Curriculum is an important part of teaching activities. While updating the curriculum in accordance with the practical principles of teaching, we aim to improve the state of practical learning. In the learning process, the master can increase the proportion of practical training courses, enrich the content of electronics practical training courses, and emphasize the importance of practical courses.

(3) Improve the quality of teachers

Due to the competition in the electronics industry, the professional quality of the master includes not only rich professional knowledge, but also advanced practical concepts and sufficient electronic practical skills. Therefore, in the process of teacher training, schools need to improve teachers' practical skills and actively guide teachers to participate in practical activities and skills training at all levels.

5.Conclusion

China's education system is constantly reforming and moving forward. Secondary vocational education has also received increasing attention. Popular majors in electronics and electrical engineering. Although we still have problems in teaching in this field, we will actively research and develop to lay the foundation for the future of special education students and help our education develop faster and better. With the continuous deepening of teaching reform in the field of applied electronics, some problems gradually appear in the learning process. When introducing e-learning, schools should take students' future employment and development as the starting point, reasonably set up content, teaching methods, and evaluation systems, and strengthen investment in the actual teacher-disciplinary learning relationship to enable students to master applications. Relevant knowledge of electronic technology will help improve technology, better respond to the requirements of high-quality education, train more people with better skills, and serve the country and society. We must give play to the role of the teacher and apprentice practice education system to meet the requirements of talent training, improve the quality of students, and enhance their practical ability. Continuously improving the teaching system of teachers and students will improve students' innovative ability and practical ability, and update the content of teaching practice, which can not only meet the needs of society, but also contribute to the sustainable development of the profession. Promoting the modern apprenticeship system in colleges and universities and developing the modern apprenticeship training model are of great significance to China's vocational education. This system is widely welcomed by teachers and students, and the development of modern teacher-apprentice model has good prospects. Effectively solving the main problems of the modern apprenticeship system at the current stage is of great help to better realize the modern apprenticeship system with Chinese characteristics. I hope that this study can provide reference and help for the development of future talent training models.

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