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Thoughts and Suggestions on Practical Ability Cultivation of Optoelectronic Technology Application Specialty in Technical Colleges

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ABSTRACT. *As one of the current high-tech, optoelectronic technology has played an important role in social development. However, there are still many problems in the cultivation of optoelectronic technology specialty in Chinese technical colleges, which seriously affects the quality of training technicians. This paper first analyzes the problems in the cultivation of optoelectronic technology application specialty in technical colleges, then the construction of the practical ability training system of optoelectronic technology applications in technical colleges is studied, and finally puts forward some valuable suggestions. The research in this article can provide a reference for talent training in technical colleges.*

KEYWORDS: *Technical colleges, Optoelectronic technology, Practical ability*

1. Introduction

In recent years, China has proposed a strategy of “developing secondary vocational education” in an attempt to make technical schools an independent educational entity and participate in market competition. With the progress of modern society and the continuous change of social needs, society has increasingly higher requirements for talents. As an important part of China's education system, technical colleges play an important role in cultivating high-quality, high-level, high-capacity technical and professional talents. This article mainly takes the practical ability training of photoelectric technology application specialty in technical colleges as the starting point, and some views on the problems and development strategies are puts forward.

2. Overview of Optoelectronic Technology Applications

Optoelectronic technology application specialty of technical colleges is to cultivate the production, application development design, engineering application design of photovoltaic products such as LEDs, solar panels, etc., and engage in product production, testing, and application design in the frontline of production, service, and management. , Engineering design, installation and commissioning, sales service and other technical and part-skilled professionals. The professional knowledge structure and level mainly include basic knowledge of electronic technology, basic knowledge of computer operation, preliminary knowledge of electronic product manufacturing technology, basic optical knowledge, and so on. In particular, the combined application of the basics of electronic technology and optical knowledge requires a certain level of knowledge and the ability for sustainable development. This major requires students to have basic circuit analysis capabilities, optoelectronic device test application capabilities, comprehensive application of professional knowledge to solve problems, and proficiency in operating electronic instruments. Judging from the investigation of enterprises, enterprises urgently need a large number of first-line technical talents in optoelectronic technology who have a solid foundation, outstanding capabilities, strong adaptability, and peace of mind. Therefore, the specialty of photoelectric technology application in technical colleges and universities has broad development prospects.

3. Analysis of Current Problems

3.1 Engineering Education Philosophy Cannot Keep Pace with the Times

At present, the photoelectric major mainly adopts traditional practice teaching methods. The lectures are mainly taught and demonstrated by teachers. The knowledge of traditional practice teaching content is outdated and cannot keep up with the rapid development of the photovoltaic industry, resulting in the development of

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students' knowledge and industry in the classroom. And the requirements are not adapted. With the development of science and technology, modern enterprises have begun to apply new technologies such as electrical control technology, automation technology and other high-tech control applications. Traditional photoelectric equipment and technologies are constantly being replaced, but some technical schools have not updated their teaching concepts in a timely manner. Therefore, the current teaching links of some technical schools cannot well meet the basic requirements of “new ideas, new requirements, new approaches” in the new era.

3.2 The Theory and Practice Fail to Connect Organically

Due to the centralized training mode adopted by some technical schools, the theoretical learning progress of each class cannot be kept consistent, and even some classes started the centralized training without completing the theoretical teaching, while some classes took a long time after completing the theoretical teaching. Only after the time entered the training. Some teachers believe that the talents of technical schools should be based on practice and supplemented by theory. The existence of this idea has made students in many technical schools “know it, but don’t know why”. Some technical schools independently carry out theoretical and practical teaching according to different classes in each school year and semester, forming what you teach you, I practice my, time, space, content division, separate situation, organic integration of engineering, theoretical practice The development of the whole has a negative effect.

3.3 Training Content is Difficult to Adapt to Job Needs

Technical colleges are the main positions for training middle and advanced blue-collar workers. The major of technical and optical technology application training in technical schools is mainly high-tech enterprises, and electrical and electronic companies are the first-line technical personnel engaged in quality control and after-sales service of equipment control products. This will inevitably require technical schools to place technical practice drills in a prominent position in their regular teaching. The training goal should be positioned on the improvement of comprehensive professional ability. This includes solid basic knowledge of optoelectronics, basic skills of maintenance electricians, certain equipment repair, maintenance capabilities, common troubleshooting capabilities and product quality inspection capabilities. However, in the current training system of technical schools, attention is paid to the content and form of training, which makes students feel boring, not enthusiastic about operation, lacks novel topics, and is disconnected from job demand. Practice links always leave students in a passive state of acceptance, and students lack the subjective initiative to acquire knowledge.

4. Construction of Practical Ability Training System

4.1 Actively Update the Concept of Engineering Education

In the process of practical teaching reform and exploration, we must form a teaching mode of “equal emphasis on theoretical teaching and experimental teaching, equal emphasis on basic skills training and innovative application ability training, equal emphasis on in class teaching and extra-curricular teaching”, and establish a three-level experimental teaching system of “basic experiment, professional experiment, comprehensive application experiment and innovative experiment” Through strengthening basic training, strengthening professional characteristics, paying attention to comprehensive application and encouraging innovation, we will cultivate application-oriented talents with solid foundation, broad knowledge, innovative spirit and practical ability. Through the establishment of the practice center of students' scientific and technological innovation, the training of students' engineering application ability, innovation consciousness and ability is strengthened, and the activity form of research-based practice is constantly explored, the practice content is enriched, and the atmosphere of independent practice and innovation of college students is formed.

4.2 Actively Adjust the Content of Practical Teaching

Taking into account the characteristics of the course of application of optoelectronic technology, the practical teaching of this course involves knowledge of optics, electricity and computers. The comprehensive design experiment should also reflect the characteristics of “comprehensive”. For example, the school can set up two comprehensive design experiments: “Electro-Optic Modulation and Demodulation” and “Integrated Photoelectric Detector Testing”. The former is based on the ordinary experiment “Electro-Optic Crystal Half-

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Wave Voltage Measurement" and adds a demodulation part. Students can build various signal transmission and demodulation devices through self-assembly systems. Such as access to mobile phone music, laser transmission in the built-in electro-optic modulation and demodulation system, demodulation at the terminal and audio playback, through the audio-visual experience, the enthusiasm and initiative of student experiments have been greatly improved. The latter basically covers all kinds of photodetector devices learned in optoelectronic technology, such as photoresistors, photocells, photodiodes, phototransistors, position detectors, four-quadrant detectors, etc., to test the illumination characteristics and voltammetry of these detectors. Characteristics, spectral characteristics, photoelectric characteristics, etc., are very comprehensive, and can cultivate the ability to comprehensively use knowledge to solve problems.

4.3 Actively Promote the Reform of Practical Teaching

Due to the great difference between the practical teaching and the theoretical teaching, according to the characteristics of the practical teaching, we focus on the training of students' practical ability and the ability to analyze and solve problems. First of all, on the basis of determining the subject of the comprehensive design experiment, the experimental hardware system platform is built. After the establishment of the comprehensive design experiment platform, the experiment should be carried out through standard steps. In order to cultivate students' ability to design and practice with comprehensive application knowledge, the teaching activities of photoelectric technology comprehensive design experiment are organized according to the stages of theoretical teaching, scheme formulation, scheme implementation, scheme inspection, scheme summary and performance evaluation. The content of the theoretical course is the knowledge points involved in the comprehensive design experiment and the working principle involved in the scheme. After the plan is made, students need to be assisted and guided to coordinate and group by student committee or monitor, each group is about 2-4 people. In addition, two students with strong hands-on ability are selected as the experimental assistants of the teachers, who cooperate with the teachers to check the process of experiment specification, experiment safety and experiment process of each group of colleagues.

5. Suggestions for Strengthening Practical Ability

5.1 Focus on Pedagogy Organization and Guidance

The selection of teaching methods should be based on the principles of practicality and effectiveness on the basis of full consideration of academic situation, school situation, and lesson situation. In China, the "double-skilled" teachers in many technical colleges and universities actively adopt innovative teaching methods such as "programmed teaching", "task-driven", "enterprise observation" and "group cooperation teaching". In the classroom teaching of professional training courses, we often find that many teachers unilaterally emphasize the use of gorgeous acousto-optic and fashionable nouns to modify teaching methods in the new lessons. As a result, the core of the teaching task is inverted, and the students 'learning methods and skills Guidance is scarce, making students less flexible when faced with complex situations when entering a job. Teachers need to pay attention to the guidance of students' learning methods and learning abilities in the course teaching, apply theoretical knowledge to practical practice, and complete the transfer and sublimation of knowledge.

5.2 Paying Equal Attention to Basic Theory and Skills Transfer

The practical ability training system of technical colleges and universities emphasizes that the course reform orientation is the work process. However, in actual teaching, some teachers' guidance and leading role are not fully played, and there is less guidance in the classroom and practical operation, so that students do not fully understand the focus of learning, and the discussion between students is superficial. At present, the training objectives of China's technical colleges and universities are still positioned at the front line of enterprise production positions, engaged in equipment operation, installation, maintenance, commissioning, product assembly, quality inspection, and after-sales service technical personnel. The training of optoelectronic technology application specialty is no exception. Orientation of "Enterprise Production Line" and "Skill Application" makes typical work tasks the core of teaching tasks in technical colleges. Teachers should explain the essential basic knowledge and methods on the one hand, and focus on the other hand Improving students' practical skills, allowing students to not only learn a wealth of theoretical knowledge, but also practice through practice, and transfer the theory to practical work, complete the combination of theory and practice, and do lessons in learning and learning The mode enables the technical school students' interest, intelligence, practical

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ability and individual potential to be improved in an all-round way.

5.3 Unification of Practical Training and Theoretical Teaching

When we strengthen the unification of the professional practice and theory of optoelectronic technology, we must avoid being excessively guided by the work process. We cannot completely ignore professional theoretical learning because we emphasize the practical process in the teaching of optoelectronic technology. Professional theoretical learning is for more Good guiding practice cannot be mistaken as long as the actual practice is to be guided by the work process, that is, the curriculum reform. The real curriculum reform needs to complete the unity of practice and theory teaching from both sides. There is a difference. “Learning by doing, learning by doing” are mutually reinforcing. Typical work tasks are the links that can best reflect professional knowledge and vocational skills in the front line of an enterprise. How to scientifically and reasonably translate typical tasks into courses in the field of study is not a simple matter, but a rather complicated process. When we reform the curriculum, we cannot completely reject traditional textbooks. We must screen and reorganize the relevant knowledge in traditional textbooks. Technical colleges and universities train skilled workers, intermediate workers, senior workers, and reserve technicians, not scholars, engineers, and scientists. . Technical school students need to learn vocational technology, not just to cultivate the ability to operate, but to focus on the cultivation of practical skills and related theoretical knowledge, not simply the cultivation of scientific principles. Taking work process as the center is to focus on professional knowledge, vocational skills, and professional experience.

6. Conclusion

At present, China has entered a new era, and the development of optoelectronic technology is changing with each passing day. Vocational education is very important for social development and talent training. It is an essential link for cultivating professional technical talents, increasing employment opportunities, and starting a business. Intensify reforms, encourage mechanism innovation, establish a training mode suitable for multi-level training of talents in accordance with social development, and build a professional training system for optoelectronic technology applications with Chinese characteristics.

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