Research on the training of applied talents in Electronic Information Engineering under the background of the Integration of Production and Education

Qin Fu 1, *, Shaohua Hu 2

Guangdong University of Science & Technology, Dongguan, Guangdong, China,

Abstract. The integration of production and education to cultivate applied talents refers to the establishment of close cooperative relationship between enterprises and colleges and universities, and the joint training of applied talents to meet the needs of society. The background and significance of this mode of cooperation lies in meeting the social demand for high-quality talents and promoting industrial development and economic prosperity. This paper takes the integration of production and education to train applied talents as the background, and takes the electronic information engineering major as an example, systematically discusses how to develop the integration of production and education to train applied talents in the electronic information engineering major. Through this research, it is expected to use theory to guide practice in the follow-up talent training to realize the leap-forward development of the major and the leap-forward improvement of the quality of student training.

1. Background and significance of industry-university cooperation in cultivating applied talents

In 2015, in the Opinions of The State Council on Deepening the Integration of Industry and Education, Promoting the Optimization of the Structure of Higher Education and Improving the Quality of Talent Training (Guofa [2015] No. 38), the state put forward relevant policies and measures to strengthen the collaborative innovation of industry, university and research and promote the in-depth development of the integration of industry and education. The cooperation mode of industry-university-collaborative education has met the society's demand for high-quality talents and promoted industrial development and economic prosperity.

First of all, due to the gap between the traditional education model and the social demand, it is a general trend to integrate industry and education to cultivate application-oriented talents. Traditional education emphasizes the imparting of theoretical knowledge, while in practical work, application ability is as important as practical experience. By cooperating with enterprises, students can get in touch with the real working environment, learn practical application skills and improve their overall quality. Secondly, with the continuous progress of science and technology and the adjustment of industrial structure, enterprises have an increasingly urgent demand for high-quality and application-oriented talents. By cooperating with colleges and universities, enterprises can participate in the process of personnel training and cultivate talents that meet their own needs. This not only improves the competitiveness of enterprises, but also promotes the development of the industry. At the same time, the training of applied talents will also help solve the employment problem, increase the employment rate and promote social stability [1]. In addition, the integration of production and education in training applied talents will also help promote scientific and technological innovation and knowledge transformation. As the main body of practice, enterprises have rich practical experience and technical resources, which can provide practical problems and needs for colleges and universities, and promote the transformation and application of scientific research results. At the same time, as the creators and disseminators of knowledge, colleges and universities can provide enterprises with cutting-edge scientific and technological knowledge and research results, and promote the improvement of enterprises' innovation ability and competitiveness. Industry-university cooperation provides a mutually beneficial and win-win platform for both sides and promotes the acceleration of scientific and technological innovation and knowledge transformation [2].

This paper takes industry-university cooperation to train applied talents as the background, taking electronic information engineering as an example, systematically discusses the problems and solutions of industry-university cooperation to train applied talents, which has certain practical significance.

* Corresponding author: 739238760@qq.com*, 740698050@qq.com
2. Research progress of training application-oriented talents by integrating production and education

The integration of production and education to cultivate applied talents is one of the current research hotspots in the field of education. Many schools and enterprises are exploring how to cultivate application-oriented talents more in line with market demand through closer integration of production and education. Related research is mainly focused on the curriculum, practical training, tutorial system, etc., in order to better meet the society's demand for high-quality talents. Wang Xiaoyan et al. [3] combined with the ICT innovation base platform and focused on cultivating students' practical ability, they actively explored the reform ideas of "digital signal processing" course in theoretical and practical teaching, including various reform measures such as teaching content design, practical teaching mode, curriculum ideological and political construction, curriculum assessment and evaluation. Huang Xiaosong et al. [4] explored the current situation and problems of the integration of the new apprenticeship system in enterprises and the development of higher vocational education, and put forward some relevant countermeasures and suggestions. Zhu Yanfang et al. [5] fully recognized the significance of the construction of cross-border e-commerce practice and training base, deeply analysed the existing problems in the construction of the current cross-border e-commerce practice and training base, actively explored the construction path and content of the cross-border e-commerce practice and training base based on the integration of production and education, and cultivated the urgently needed applied professionals in the cross-border e-commerce industry. Rybnicek R et al. [6] extensively analysed the published studies on industry-university cooperation projects, aiming to extract the factors affecting the success of such cooperation, and finally put forward a new conceptual model. Hanel, P et al. [7] suggest that collaboration with universities is frequent in knowledge-based industries. Research undertaken in partnerships complements, rather than replaces, R&D by collaborating firms. Collaboration improves the performance of innovating firms.

3. The main problems faced by colleges and universities in training applied talents

3.1. The teaching content is out of line with the actual demand

Traditional college education emphasizes the imparting of theoretical knowledge, while in practical work, students need to master practical skills and problem-solving abilities. This disconnect between teaching content and practical needs is widespread in many industries. One of the reasons is that teachers lack practical experience to keep abreast of the latest developments and changes in demand in the industry. Many teachers may have worked in related industries before entering the education field, but their ties to the industry gradually waned over time, leaving them unable to keep up with the latest developments in the industry. This makes it impossible for them to accurately impart the practical skills and problem-solving abilities needed by students in their teaching. Another reason is that the pace of syllabus and textbook updates can't keep up with the industry's development. The development of syllabuses and textbooks usually needs to go through a series of approval and revision procedures, which makes them relatively slow to update. However, the pace of development of the industry is usually very fast, and new technologies and methods are constantly emerging. As a result, teaching content often lags behind actual needs and fails to reflect the latest developments in the industry in a timely manner. This makes students often need to go through a period of adaptation and training after graduation before they can be qualified for work, which brings certain troubles to both enterprises and students.

3.2. Lack of teaching staff

Training applied talents is one of the important tasks of college education. To achieve this goal, teachers with rich practical experience and industry background are needed. However, the reality is that many college teachers are teachers directly after graduation, and they lack practical experience in enterprises, let alone cannot combine theoretical knowledge with practical application, which has a certain impact on the cultivation of students' practical ability. First of all, teachers who lack practical experience cannot provide students with real industry background and case analysis. In the training of applied talents, students need to understand the actual working environment and problems, and this knowledge can often only be imparted through the practical experience of teachers. However, since teachers themselves have no experience working in enterprises, they are unable to provide real cases and practical experience, which makes it difficult for students to combine theory with practice. Secondly, college teachers need to undertake a large number of scientific research tasks, which also leads to their inability to devote more energy to teaching. Scientific research is one of the important responsibilities of college teachers, but too many scientific research tasks will distract teachers from teaching, and they will not be able to devote more time and energy to the cultivation of students' practical ability. In this case, teachers may only be able to teach through classroom explanation and book knowledge, rather than providing more practical opportunities and guidance.

3.3. Imperfect practice environment and facilities

When cultivating application-oriented talents, colleges and universities need to provide good practice environment and facilities so that students can carry out practical operations and practical projects. However,
many laboratories, studios and other practice places in colleges and universities are old and unable to meet the practical needs of students, which limits the cultivation of students’ practical ability. In this case, students may not be able to truly grasp the application of what they have learned, only staying at the theoretical level, unable to combine what they have learned with practical problems. This is a hindrance to cultivating students’ practical ability and problem-solving ability. In addition, an imperfect practice environment may also result in students being unable to access the latest industry developments and technological trends, putting them at a disadvantage when faced with job competition after graduation. In the fast-moving era of science and technology, the technologies and demands of the industry are constantly changing, and students need to keep abreast of and adapt to these changes. However, if the practical environment of colleges and universities cannot provide the latest equipment and technical support, students will not be able to keep up with the pace of the industry and lack the ability to keep pace with The Times.

3.4. The evaluation system is unreasonable

The traditional evaluation system pays too much attention to students' mastery of theoretical knowledge and neglects the cultivation of practical ability. Under the traditional teaching mode, students acquire knowledge mainly by listening in class and taking examinations, but lack opportunities for practical operation and practice. However, application-oriented talents need to possess practical operation and problem-solving abilities, which cannot be acquired through the study of theoretical knowledge alone. In addition, the traditional evaluation system pays too much attention to test scores and neglects the cultivation of students' innovative ability. Under the traditional teaching model, students pursue high scores mainly through rote memorization and rote test-taking training. However, innovation ability is one of the necessary qualities for application-oriented talents, which requires students to have the ability to think independently, solve problems and innovate practice. However, the traditional evaluation system cannot effectively evaluate the students' innovation ability, resulting in the lack of innovative thinking and practical ability in the training process.

3.5. Lack of opportunities to cooperate with enterprises

When cultivating applied talents, colleges and universities need to cooperate with enterprises to provide practical opportunities and internship opportunities. However, many colleges and universities have limited opportunities for cooperation with enterprises, and it is difficult for students to get access to real working environment and projects, which limits the training effect of applied talents.

4. The emphasis of training applied talents in electronic information engineering under the background of industry-university cooperation

4.1. Improvement of curriculum setting and teaching methods

The major of electronic information engineering should pay attention to cultivating students' practical ability and innovation ability. In the curriculum setting, practical courses and project practice courses should be added, such as electronic circuit experiment, embedded system design, electronic system comprehensive design, etc., to improve students’ hands-on ability and ability to solve practical problems. At the same time, the problem-oriented teaching method should be adopted to guide students to learn and explore actively, and cultivate students' independent learning and problem-solving ability.

4.2. Strengthen practical teaching and practice training

The major of electronic information engineering should strengthen practical teaching links, provide sufficient laboratory equipment and practice platform, so that students can carry out practical operations such as circuit design and electronic device debugging. At the same time, it should cooperate with enterprises to carry out practical training activities, so that students can have access to real engineering projects, understand industry needs and work processes, and cultivate practical operation and teamwork ability.

4.3. Carry out industry-university-research cooperation projects

Electronic information engineering majors should actively cooperate with enterprises and scientific research institutions to carry out scientific research projects and technological innovation activities. By cooperating with enterprises, students can participate in real engineering projects, understand industry needs and technological development trends, and cultivate the ability to solve practical problems. At the same time, the cooperation between schools and enterprises can also provide internship and practical training opportunities and employment opportunities, providing students with more practical opportunities and job security.

4.4. Launch innovation and entrepreneurship education

The major of electronic information engineering should focus on cultivating students' innovation and entrepreneurship ability. Schools may offer education courses on innovation and entrepreneurship to guide students to practice innovation and entrepreneurship and cultivate students’ innovative thinking and
entrepreneurial awareness. At the same time, schools can provide support and resources for innovation and entrepreneurship, such as business incubators and innovation funds, to provide students with platforms and opportunities for innovation and entrepreneurship.

4.5. Cross-disciplinary training

The major of electronic information engineering should encourage students to conduct cross-disciplinary training. Electronic information engineering is closely related to computer science, communication engineering, automation and other disciplines, and students can choose interdisciplinary elective courses to broaden their knowledge and skills. Interdisciplinary training can cultivate students' comprehensive ability and innovation ability, and improve students' competitiveness[10].

5. Summary and outlook

In today's society, industry-university cooperation has become an important way to train application-oriented talents. In the electronic information engineering specialty, it is of great significance to train application-oriented talents under the background of industry-university cooperation. By cooperating with enterprises, students can be exposed to real working environments and practical projects, and improve their practical ability and problem-solving ability. At the same time, industry-university cooperation can also promote the organic combination of teaching and practice, so that the theoretical knowledge learned by students can be applied in practice, and improve the enthusiasm and initiative of learning.

However, there are still some problems in the process of training application-oriented talents in electronic information engineering. First, the cooperation mechanism between schools and enterprises is not perfect enough, and the selection and management of cooperative projects need to be further strengthened. Secondly, there is a certain gap between the practical experience of school teachers and the needs of enterprises, and it is necessary to strengthen the cultivation of teachers' practical ability and communication with enterprises. In addition, students may face the challenge of practical problems in the practice process, and it is necessary to strengthen the cultivation of students' practical ability and problem solving ability. In order to solve these problems, we need to further improve the mechanism and management system of industry-university cooperation, and strengthen the cooperation and exchange between schools and enterprises. At the same time, schools should strengthen the training of teachers' practical ability and improve the matching degree between teachers' practical experience and the needs of enterprises. In addition, schools should strengthen the training of students' practical ability, provide more practical opportunities and projects, and cultivate students' problem-solving ability and innovation ability.

In a word, it is of great significance to train applied talents in electronic information engineering under the background of industry-university cooperation, but it still faces some problems. By further improving the cooperation mechanism and management system, and strengthening the practical ability training of teachers and students, we are confident that we can better train application-oriented talents to meet the needs of society.

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References