

# Analysis on the cultivation of innovation ability in secondary vocational electrical and electronic teaching

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**Abstract:** with the continuous promotion of the current concept of quality education, higher requirements are put forward for the teaching work carried out by the teachers of electronic and electrical engineering major in secondary vocational colleges. Teachers should not only strengthen the teaching of students' theoretical knowledge and the cultivation of their practical ability, but also realize the important value of cultivating students' innovative ability. Teachers should combine the process of knowledge transfer and skill training to innovate teaching mode and explore specific methods to enrich the value of the curriculum. This paper first discusses the implementation principles of the cultivation of students' innovative ability, and then explores the Cultivation Strategies of students' innovative ability in secondary vocational electrical and electronic teaching, in order to help students achieve better growth and development while comprehensively improving the quality of electrical and electronic teaching.

**Key words:** Secondary Vocational electrical and electronic; Innovation ability; Training strategy

Innovation is the driving force to support and promote the rapid development of all walks of life. As technical talents cultivators, secondary vocational schools should pay attention to the cultivation of students' innovation ability and help them lay a solid foundation for participating in and carrying out innovation activities. The secondary vocational electrical and electronic specialty involves many fields and is an important position for the development of various industries to cultivate technical talents with high innovation ability. In order to enhance the competitiveness of students in the future society and promote the construction of electronic and electrical engineering specialty to meet the needs of the industry, teachers must strengthen the exploration of scientific and efficient teaching methods to effectively cultivate students' innovation ability.

## 1. Principles of cultivating students' innovative ability in secondary vocational electrical and electronic teaching

### 1.1 Systematic principle

The process of cultivating students' innovative ability is gradual, not overnight. Teachers should design electronic and electrical teaching and objectives in a systematic way, and build the development process of students' innovative ability into a systematic project. On the one hand, teachers need to combine the characteristics and learning rules of secondary vocational students, formulate a systematic innovation ability development plan, and integrate relevant development strategies into students' daily learning. Secondly, teachers should pay attention to the gradualness of students' learning content and difficulty, steadily improve their innovation ability and innovation consciousness, and lay a foundation for them to adapt to social development.

### 1.2 Flexibility principle

To a certain extent, innovation is an activity that is not rigidly bound by methods and forms. In Cultivating Secondary Vocational Students' innovative ability, we should adhere to the principle of flexibility, and develop students' creativity through diversified training modes. In the implementation of electronic and electrical teaching, we should widely adopt students' opinions and learn from others' experience, so as to realize the brainstorming process of training mode innovation, create a flexible learning atmosphere for students, and promote their free innovation.

### 1.3 Applicability principle

As an important part of professional quality, innovation ability should adapt to the actual needs. When training Secondary Vocational Students' innovation ability, teachers should explore the teaching mode that is really suitable for students under the principle of applicability, and ensure that the training content is connected with the development of electronic and electrical industry. When choosing, innovating and applying the teaching mode of electronic and electrical engineering, we should avoid innovating for the sake of innovation, and should not ignore the actual needs of students because of the pursuit of novel mode.

## 2. Analysis of the current situation of electrical and electronic teaching in Secondary Vocational Schools

### 2.1 Lack of professionalism in teaching objectives

At this stage, the teaching objectives of secondary vocational electrical and electronic professional courses lack the guidance of post ability requirements. Even if students master the most critical technologies and application methods, they may not be able to enter the enterprise or find suitable jobs smoothly. This is because the teaching of this major is influenced by the traditional education concept, which makes the students' knowledge and skills as the goal. Although most of them have achieved good academic results in theory, they are always lacking in cognitive concept, ideological and moral character, and interpersonal skills. The author believes that the solution to this problem is not achieved overnight. Only by integrating all-round and multi angle professional quality training, and effectively optimizing the teaching

objectives of the professional courses, can we cultivate excellent talents matching social posts, and effectively improve the school running vitality and comprehensive level of secondary vocational colleges.

#### 2.2 Lack of job responsibilities in teaching content

Since the implementation of the new curriculum standard, new educational concepts and teaching methods have been gradually integrated into the teaching of electrical and electronic specialty courses in secondary vocational schools. The traditional teaching mode has changed to a new mode. Many front-line teachers have also tried to expand classroom teaching ideas in this way. But in fact, the adjustment of teaching methods is far from enough. In view of the lack of job responsibilities in the relevant teaching content, teachers need to understand, explore and practice more, not only to avoid the repetition of teaching content, but also to introduce new "professional" content as much as possible. Only in this way can secondary vocational students know how to deal with and solve practical problems when they are exposed to relevant work in the future. It can be seen that secondary vocational electrical and electronic professional course teachers should fully understand the relevant job responsibilities, and adjust the teaching ideas according to the job responsibilities.

#### 2.3 Teaching methods are inconsistent with students' Cognition

In the teaching of secondary vocational electrical and electronic professional courses, most teachers adopt the project-based teaching method, hoping to exercise and improve students' hands-on ability through project practice. However, some secondary vocational students lack a solid professional foundation, and there are also deficiencies in team awareness, cooperation awareness and other aspects, so the final teaching effect can be imagined. It can be seen that the single teaching method has limitations. Teachers of secondary vocational electrical and electronic professional courses should also take a long-term view, explore situational teaching, case teaching, mixed teaching and other methods, and apply several methods to urge students' hands-on operation and practical training as much as possible.

#### 2.4 Teaching evaluation is difficult to reflect students' level

Score is an important indicator to intuitively reflect students' phased learning achievements, but it is not the only reference indicator. In teaching practice, it is easy for professional teachers to confuse these two concepts, which makes students' understanding of their own learning situation unclear, and it is even more difficult for parents and schools to implement education. Secondary vocational electrical and electronic majors, like other majors, take the scores of theoretical examination and operation examination as the standards to measure students' phased learning achievements. This also makes many students gradually lose their interest in professional learning, and they are prone to be bored, irritable and tired in the process of learning.

### 3. Strategies for cultivating students' innovative ability in secondary vocational electrical and electronic teaching

#### 3.1 Clarify market demand and scientifically set talent training objectives

Secondary vocational schools aim to cultivate skilled talents, connect the talent chain with the industrial chain, and open up a new path for the development of vocational education. The author believes that in order to clarify the teaching objectives of secondary vocational electrical and electronic professional courses, we must understand the talent training objectives of the major, that is, we must establish a special leading group to optimize the talent positioning and education objectives, and introduce a new training plan or curriculum standards to guide front-line teachers to carry out targeted and refined vocational education. On this basis, teachers of electrical and electronic professional courses should also actively explore the "professional" content, which is bound to integrate new content into the process of the integration of theory and practice teaching, realize the employment oriented electrical and electronic professional course teaching, and further cultivate secondary vocational students' independent thinking and independent practice. With market demand as the orientation of professional talent training objectives, students as the basis for education, and ability-based training, we focus on the development of students' practical ability and core competitiveness. Such teaching of electrical and electronic professional courses can achieve twice the result with half the effort. It can also stimulate the internal potential of secondary vocational students, so that they can establish great ideals and beliefs and work hard for them.

#### 3.2 Improve teachers' quality and help students' all-round growth and development

In the teaching process of secondary vocational electrical and electronic professional courses, the level of teachers is very important, and the comprehensive quality of teachers will also directly affect the students' learning and ideological status. However, there is a lack of professional teachers to support the cultivation of electrical and electronic professionals in secondary vocational schools, especially teachers with information teaching, practical teaching experience and professional practical experience. The overall quality of most teachers needs to be improved. In this regard, secondary vocational schools can use holidays, winter and summer holidays to arrange some teachers to take temporary posts in enterprises, so that they have the opportunity to contact the job content, further feed back the job information and market demand information into the teaching process, and strengthen the guidance and pertinence of the teaching of electrical and electronic courses. Of course, front-line teachers should also actively explore new educational ideas, communicate with students in depth, explore students' interests, psychological needs, personality characteristics and family conditions, and strive to rebuild the teaching system of electrical and electronic courses. In addition, the school should also strengthen efforts to promote the construction of "double qualified" teaching team, actively introduce talents from outside, and let those professionals who really understand technology and operation enter the school and classroom by deepening the school enterprise cooperation relationship, so as to guide students' project practice and share some experience of job hunting and employment for the majority of students. In short, it is important to strengthen the comprehensive quality of the professional teaching team. Secondary vocational schools should grasp the development strategy of "bringing in and going out",

strengthen the teaching staff and improve the school running vitality and education level of the major.

### 3.3 Promote school enterprise cooperation and comprehensively improve students' practical ability

Secondary vocational schools should actively promote the construction of school enterprise cooperation and work study combination education mode, apply for social resources to help in the principle of equality, justice, mutual benefit and mutual benefit, realize the effective connection between school education and enterprise production, and strive to promote the high-quality development of secondary vocational electrical and electronic professional curriculum teaching through the construction of training base and the revision of talent training plan. At the same time, the school can also infiltrate the enterprise culture, enterprise philosophy and other contents in the process of education, focus on Cultivating Secondary vocational students to form a "workplace person" thinking, strengthen their abilities and qualities in all aspects, and make the majority of secondary vocational students ready for further education and employment in the future. Based on the cooperation between school and enterprise and the combination of work and study, we should strengthen the reform of the talent training mode of electrical and electronic specialty in secondary vocational schools, further broaden the path of vocational skills training according to the job demand, and provide students with good learning conditions for electrical and electronic specialty in secondary vocational schools, so that they can be exposed to the actual operation of more advanced equipment and the content of vocational posts in advance.

### 3.4 Control the difficulty of practice and guide students' application and innovation ability

The design of teaching objectives and contents should consider the development status of students' practical ability, especially the difficulty of some operation training tasks should adapt to the development of students' ability. For example, secondary vocational students' basic knowledge is generally weak. When teaching the relevant knowledge of circuit diagrams, teachers should reasonably control the difficulty of practice according to their own teaching style and the development level of students' practical ability, so as to promote students to apply their innovation ability in the process of mastering textbook knowledge and realize the further development of comprehensive ability. First of all, based on the analysis of the learning situation, teachers need to select the circuit with less components as a teaching case to guide students to be familiar with the basic circuit connection methods and principles. Secondly, after students have formed a basic understanding of theoretical knowledge, learning tasks and electronic components, they can be organized to carry out practical training to avoid students' being too hasty in actual operation, or even making mistakes. When accepting this part of the content, the author selected the flashlight familiar to the students as the training material, and asked the students to transform it into a small night light. Training materials flashlight and training task night light are common in life. Students can explore the power supply principle of night light and the transformation method of flashlight in combination with their original cognition, which is conducive to stimulating students' interest in innovation and eliminating students' tension in learning new knowledge.

### 3.5 Constructing the second classroom and encouraging students to carry out free innovation

In order to help students master skills and cultivate their interest in exploration, teachers should build a second classroom for students - set up a maintenance interest group and an electrician production group, so that students can carry out innovative activities in relatively free time and space. Both groups are headed by teachers, who are responsible for the overall arrangement of practical activities. Although the production task is relatively simple on the whole, teachers should still pay attention to maintaining a certain gradient and gradually increasing its complexity when arranging practical activities. In addition, teachers should also pay attention to the practicability and interest of the production task to help students maintain a high interest in participation; The task of circuit troubleshooting is relatively complex, which needs to be discussed and solved by both teachers and students. Teachers should pay attention to giving students space for independent thinking. Generally speaking, after finding out the cause of the fault, students should be guided to design solutions and complete the maintenance work, organize to record the fault phenomenon, causes and treatment methods, and finally form electronic notes for everyone to share. When students' maintenance skills reach a certain level, students are encouraged to participate in volunteer activities in the community to repair objects for residents. In the actual maintenance practice, it can not only verify students' ability, but also create opportunities for students to contact more new electronic products. The author found that helping people solve life problems, letting students experience the fun of practice and the value of professional knowledge, and promoting the effective improvement of students' learning enthusiasm, innovation consciousness, service consciousness and identity.

## 4. Conclusion

In a word, the teaching reform of secondary vocational electrical and electronic professional courses is not achieved overnight, but also requires front-line teachers to devote themselves to exploration and practice, to optimize the professional classroom, improve the quality of course teaching, and further cultivate students' innovative ability. Through the introduction of information technology in the teaching process, I believe it can reduce the difficulty of students' understanding and mastering knowledge, inspire students to use computer thinking to solve problems, and then achieve twice the result with half the effort. This also has a positive impact on improving the teaching quality of secondary vocational electrical and electronic professional courses.

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