Research and practice on training mode of applied talents for electrical engineering majors in universities

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Abstract: The training of applied talents focuses on students' innovation ability and engineering practice ability, which requires electrical engineering teachers to fully embody the integration of theoretical knowledge and engineering practice in their teaching. In the teaching reform work, teachers should pay attention to optimize the teaching Settings, starting from two aspects of theory and practice, to promote students to obtain more knowledge of electricity, effectively develop students' application level of electric electronic technology, and help students develop comprehensively. Colleges and universities should pay more attention to the training of application-oriented talents and train more qualified talents for the development of social production. Based on this, this paper analyzes the practical strategies for the training mode of applied talents for electrical engineering majors in colleges and universities, in order to provide references for educators.

Key words: universities; Electrical engineering major; Applied talents; Training mode

Introduction: In 2014, the Ministry of Education clearly proposed to guide a number of undergraduate colleges and universities to turn to applied technology colleges and universities, promote schools to play a role in serving economic construction, and train more application-oriented talents. The training goal of applied talents for electrical engineering major is to cultivate high-quality talents with excellent professional skills, teamwork ability and ability to solve complex engineering problems in the electric power industry with the international certification standards as the core. However, as far as the reality is concerned, students currently have few opportunities to practice and cannot achieve zero distance with the industry. Teachers should focus on the training objectives of applied talents, adjust teaching reasonably, improve teaching practicability, and help students develop in an all-round way.

1. Current situation of training applied talents for electrical engineering majors in colleges and universities

1. Theoretical teaching content lags behind technical development

The courses of electrical engineering major are more difficult, and the theoretical knowledge is comprehensive, including advanced mathematics, electric power system relay protection and other contents. Students need to master the basic principles and analysis methods of electrical engineering, which plays an important role in personnel training. The electrical engineering industry is developing rapidly. Taking the development of electric power system relay protection as an example, it has experienced electromechanical type, transistor type, integrated circuit type and the current microcomputer type. Students need to master the knowledge and skills of equipment maintenance and debugging in the course learning, so as to pave the way for the future operation and maintenance and equipment debugging work, and ensure the close combination of teaching and engineering site. However, in the actual teaching, the teachers mostly explain the principles of electrical engineering knowledge, and the content of technical development and engineering practice is less, coupled with the lack of professional textbooks to supplement the front-end technical information of the industry, so that the skills mastered by students can not meet the needs of the industry.

2. The teaching method of professional practice needs to be reformed

The teaching method of electrical engineering is relatively simple, which is not conducive to the development of students' practical ability. In the new era, modern information technology and new teaching methods are emerging one after another. Teachers need to adjust their teaching according to the development of The Times, and apply modern technology such as virtual simulation technology and cutting-edge teaching methods such as project-based teaching to practical teaching, so as to make teaching activities more flexible and vivid. As far as actual teaching is concerned, many teachers are influenced by traditional teaching concepts and use lecture-style teaching methods in teaching, which makes the integration of theoretical teaching and practical training insufficient, and the teaching methods adopted are relatively simple. Traditional teaching cannot mobilize students' enthusiasm for learning, which is not conducive to the improvement of teaching effect.

2. Practical research on the training mode of applied talents for electrical engineering majors in colleges and universities

1. Clear curriculum teaching objectives and pay attention to the overall development of students

Teaching objectives have a strong orientation, and reasonable setting of teaching objectives can guide the subsequent teaching reform. First of all, teachers should pay attention to students' ability development and make curriculum teaching objectives clear. Taking the course of electric power system relay protection as an example, teachers can set the following goals in combination with teaching content and students' ability development needs: First, knowledge goals. Through the course learning, students can master the basic principles of current protection, distance protection and longitudinal protection of transmission lines, can understand the basic principles of generator,

transformer and bus protection, and understand the basic composition of power system relay protection. The second is the ability goal. Through the course study, students can master the setting calculation principles of current protection and distance protection, and can apply the knowledge to solve problems related to protection systems and analyze complex engineering problems. Third, quality goal. Through teaching activities, cultivate students' good scientific and cultural accomplishment and professional ethics, and develop students' innovative spirit and cooperative spirit. For example, in the teaching of "High Voltage Technology", teachers can set the following goals: first, to be able to use dielectric electrical strength, materials and other course knowledge to explain electrical engineering related problems; Second, to be able to apply the principle of experiment to implement related experimental activities; The third is to be able to analyze and use lightning protection, combined with the actual needs of electrical work to select and configure related lightning protection devices; The fourth is able to take different measures to inhibit the internal overvoltage of the power system, combined with the actual needs to determine the insulation cooperation of complex electrical engineering. In order to effectively promote the development of students' ability, teachers should pay attention to updating the professional teaching objectives according to the dynamic development of the market, and enhance the scientific and credibility of the teaching objectives. In professional teaching, teachers should not only pay attention to the development of students' practical operation ability, but also pay attention to the cultivation of students' professional ethics and comprehensive quality. The course of electrical engineering is very difficult, so teachers should pay attention to sorting out the teaching content, find out the connection between theory and practice, set teaching objectives scientifically around the development of students' ability, and refine the overall objectives into small objectives of each course, so as to ensure the effective implementation of teaching objectives. Secondly, on the basis of establishing teaching objectives, teachers should pay attention to innovation and integration of course content, make boring theoretical knowledge more vivid and interesting, reduce the difficulty of course understanding, and help students absorb and master the original knowledge of concepts. In this process, teachers can integrate teaching resources with the help of information technology and Internet platform, provide students with cutting-edge electrical engineering knowledge, integrate boring theoretical knowledge into interesting teaching videos, and broaden students' learning vision.

2. Introduce practical training programs to cultivate students' comprehensive ability

In order to effectively implement the training goal of application-oriented talents, teachers should pay attention to the introduction of practical training projects, use the integrated teaching mode, promote the effective integration of theoretical knowledge into practical activities, ensure the synchronization of theoretical learning and practical operation, and effectively cultivate the comprehensive ability of students. Electrical engineering requires relatively high knowledge and skills of relevant practitioners, who need to be able to use knowledge and skills to solve engineering problems, which requires students to effectively combine theoretical knowledge and practical skills. In this regard, schools should use project-based teaching to exercise students' comprehensive ability and promote students to apply what they have learned. For example, in the teaching of the course "Electric Power System Relay Protection", considering that most of this course is offered in the third year, students have learned a lot of electrical engineering knowledge before, and this course can be combined with actual engineering content to set up project-based teaching activities to provide students with opportunities to get in touch with practical work. The ability to solve practical work problems is a necessary ability for students to engage in post work. Teachers should carefully select project activities according to the teaching content to effectively mobilize students' enthusiasm for learning. Taking the project "35 kV one-sided power transmission line current protection Design" as an example, the teacher made a comprehensive analysis of the project content in the course, summed up the project requirements and sent them to each learning group. After receiving the task, the study group sorted out a relatively complete research process, including material collection, project discussion, project implementation and other processes, so as to form a feasible operation plan and summarize the research experience and problems encountered. Then, the teacher helped the students solve the problems they encountered, provided targeted guidance to each group, and promoted the project process of each group. Finally, each group presented the project results, the teacher evaluated each group project, put forward suggestions for modification, guided each group to improve the project design, and the teacher summarized the research results of each group. In daily teaching, teachers should first explore the future development direction and work content of electrical engineering major, mainly including electrical equipment debugging, electrical equipment maintenance, etc., in order to work out the specific goals of each course, including circuit maintenance ability and electrical equipment installation ability. According to the specific post requirements to develop teaching plans, set up different teaching content, such as electrical equipment installation and commissioning teaching, common electrical equipment maintenance practice training, set up different training programs for different ability objectives. For example, in the teaching of PLC technology courses, teachers can set the teaching goal of "mastering the ability to solve electrical engineering problems", design PLC technical problems for students, so that students can master theoretical knowledge through theoretical learning. On this basis, teachers can set practical activities of different difficulties, including completing the responder, lighting control, analog control, etc., to gradually enhance the practical difficulty of students. Effective development of students' comprehensive ability.

3. Promote the integration of production and education in teaching and supplement the content of science and innovation competitions

With the dynamic changes of the market environment, the electrical engineering industry continues to update and develop, in order to avoid the problem of insufficient connection between teaching and market, schools should strengthen the connection with the market, through the integration of industry and education, participate in science and innovation competitions, etc., to obtain market development trends, and absorb more emerging technology resources. First of all, pay attention to promoting the integration of production and education in teaching. The integration of production and education is an important means to promote the development of electrical engineering teaching. It can not only promote the updating of teaching content, but also provide more practical training opportunities for students and

improve their comprehensive ability. In this regard, the school should organize more students to participate in the practice of electric power enterprises, let students enter the substation and power plant to participate in the practice during the junior and senior years, and include the practice activities of students in the scope of teaching assessment. The practical activities of power engineering include power generation and distribution, power equipment maintenance and so on. For example, in the junior year, the school organizes students to practice in electric power maintenance enterprises, provides students with opportunities to practice electric power maintenance, allows students to experience the training of enterprise experts, on-the-job training, hands-on operation and other processes, experience electric power equipment fault inspection, fault maintenance and disassembly, etc., and gain ability growth in the experience. In this process, students can further feel the leading technology of power engineering industry and be influenced by corporate culture, which can enhance professional quality, cultivate students' craftsman spirit and make students willing to contribute their own strength to the development of the industry. A lot of knowledge in enterprises is not found in textbooks, and students can get answers to questions they meet in the internship from corporate tutors or school teachers, which lays a good foundation for their future development and employment. Secondly, pay attention to supplementing the content of science and technology innovation and competition. Science and innovation and competition integrate the industry's front-end technology and cutting-edge research problems, and it is of great significance to introduce it into professional teaching, which is conducive to promoting the updating of teaching. In this regard, teachers can organize students to participate in various competitions as a team, such as Internet +, Challenge Cup, etc., to provide guidance for students' participation. As far as Jiao Xu is concerned, many students are willing to participate in discipline competitions and science and technology innovation, which can not only exercise students' teamwork ability, accumulate practical experience, but also cultivate students' good thinking habits. For example, considering that the course content is abstract and difficult, many students cannot effectively grasp and understand it, teachers can organize students to participate in scientific innovation projects of synchronous reluctance motor, stimulate students' sensory experience with magnetic field distribution map, drive students' practice with experimental operation, and let students take the initiative to compare textbook knowledge with their own experience. And further deepen the understanding of knowledge. The introduction of science and innovation projects and competitions can not only serve as a supplement to teaching, but also mobilize students' enthusiasm for learning and pave the way for students to enter the industry in the future.

Concluding Remarks

To sum up, electrical engineering majors in colleges and universities should pay attention to the training needs of application-oriented talents, start from two aspects of theoretical teaching and practical teaching, set reasonable training goals, integrate theoretical teaching knowledge, enrich practical projects, effectively improve students' comprehensive ability through the teaching method of combining theory with practice, and enhance students' competitiveness in employment, innovation and entrepreneurship competitions. To supply more high-quality talents related to electrical engineering to the market. In the teaching process, teachers should pay attention to the innovation of teaching means, apply advanced teaching methods to create a good teaching environment for students, so as to improve students' professional operation level and help students' development.

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