Practice and Reform of Electronic Technology Practice Curriculum under Background of Professional Certification In Engineering Education

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Abstract: According to the requirements of engineering education certification for the practice course of electronic technology, the contents and measures of practical teaching reform are put forward for the problems existing in the teaching of electronic technology practice courses, and the goal of practical teaching reform is clarified. Construct a student-centered, engineering-oriented and diversified practical teaching model.

1. Introduction

According to the "Engineering Education Professional Certification" standard, we adhere to the results-oriented, student-centered, continuous improvement, and cultivate the educational philosophy of lifelong learning. Cultivate students' ability to use the comprehensive application ability, new knowledge and new technology search and learning ability, and professional work communication skills as an engineering and technical personnel. Achieving the "Engineering Education Professional Certification" standard has practical significance for the cultivation of applied talents and the improvement of teaching quality in colleges and universities, and the improvement of graduates' practical ability and innovative ability. Engineering education professional certification is an opportunity for colleges to standardize and improve the quality of professional teaching. Higher education urgently needs to be embedded in engineering education, and engineering practice teaching has increasingly become the focus of higher engineering education reform.

The electronic technology practice course involves multiple experiments, training and curriculum design, with many knowledge points, abstract teaching content, and closely related to engineering practice. The practice link is the introductory training link to guide students into engineering application, which is essential for the cultivation of applied talents, and is an important way to cultivate students' practical ability, engineering quality and innovation consciousness[1-2].

2. Problems in the Teaching of Electronic Technology

2.1 The Arrangement of Practical Teaching Content is Unreasonable.

The teaching content of electronic technology practice mainly includes three aspects: experiment, training and curriculum design. First of all, the proportion of verification content in the existing experimental projects is too large, and the design and comprehensive experiments are insufficient, which is not conducive to the cultivation of students' innovative design ability. Secondly, the content of the training program is small and fixed, and the students lack the space to use their own resources. Basically, they passively perform circuit assembly or circuit simulation experiments according to the requirements set by the teacher. Students do not play their own initiative, lack of a comprehensive view of the completion of complex engineering problems, can not proceed from the overall task of the overall situation, comprehensive consideration of the various factors of the completion of the project. There are also curriculum design projects that emphasize theoretical design, lack of interest, practicality, difficulty in mobilizing students' enthusiasm and initiative, and

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are not conducive to students' ability to innovate.

2.2 Lack of Innovation in Practical Teaching Methods.

At present, most of the experimental project operations use the existing ready-made circuit on the experimental box, students only need to add signal test, so that students' ability to identify components, circuit lap and debug can hardly be exercised. In the training and curriculum design projects, the teachers are too strict on the content and steps of the practice, which limits the students' ability to play.

2.3 The Practice Teaching Evaluation System is not Perfect.

At present, most of the electronic technology experiments are in-class experiments. There is no separate course. The experimental results only account for a small part of the total score. Therefore, the students do not pay enough attention. The training and curriculum design pay more attention to the practice report assessment, lack of defense links and students' practical ability assessment. There is no different assessment content and standards according to different practice links. The whole process is lack of monitoring in the whole process. Some students even take the same ride and rely on other similar topics. Classmates complete the task.

Therefore, the existing practical teaching can not achieve the expected training objectives of engineering education professional certification. For electronic related majors, the practice teaching reform of electronic technology is particularly necessary [3-5].

3. Electronic Technology Practice Teaching Reform Content

3.1 Designing Practical Teaching Content for the Purpose of Training Engineering Practice Ability.

Engineering education certification emphasizes that the profession should have the necessary practical teaching system to meet the engineering needs, and attach importance to cultivating students' engineering practice ability and innovation consciousness. Therefore, the practical teaching philosophy based on capacity development must run through the whole process of the talent development plan. In the specific implementation process of practical teaching, it is necessary to clarify which abilities of students are cultivated and how to construct students' engineering awareness in a subtle way. In practice teaching system should design the practical teaching link that matches the expected goal; construct the four-in-one electronic technology practice course teaching system of "experimental teaching, practical training, curriculum design, innovative practice", which will be verified, designed and integrated. Type practice and innovation and entrepreneurship projects are integrated into the practical teaching process. Formed by the "basic experiment - professional training - comprehensive project training - innovation training" four levels constitute students from shallow to deep, systematic engineering practice ability training, as shown in Figure 1.

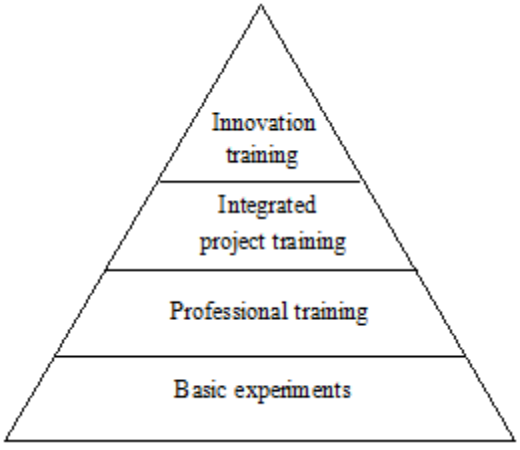

Figure 1. Multilevel capacity development

3.2 Taking Students as the Main Body, Reforming Practical Teaching Methods.

Under the concept of student-centered engineering education, the existing teaching model will be reformed to study the "diversified, hierarchical, and procedural" teaching model. Introduce open experimental teaching and virtual-practice combined diversified teaching methods to provide students with new and more resource-rich experimental teaching platforms; for different levels of knowledge, students should layer design the experimental content; The implementation process is decomposed into four main stages of learning, simulation, experimentation and innovation, which help students to effectively understand and apply knowledge, and then generate the ability of knowledge innovation.

3.3 Optimize the Evaluation and Evaluation System based on the Requirements of Engineering Education.

Based on the requirements of engineering education, based on the training and orientation of engineering professionals and the practical curriculum system, an evaluation system based on “resultive” and “procedural” is constructed. Establish practical teaching evaluation indicators for all-round, multi-angle and whole-process monitoring of practical teaching objectives, contents and teaching processes, in order to fully reflect the characteristics of practical teaching that match the professional certification of engineering education, and form diversified practical teaching forms and practical innovation capabilities mode.

4. Electronic Technology Practice Teaching Reform Measures

4.1 Strengthen the Engineering Practice Knowledge System and Cultivate Students' Engineering Application Ability.

In practical teaching, it emphasizes the application background of engineering, approaches the application of engineering, closely follows the practical application, integrates relevant engineering practice knowledge into the teaching content, and effectively combines experimental teaching, practical training, curriculum design and innovative practice. Make the practical teaching closer to the actual project and achieve the purpose of learning. At the same time, in the arrangement of teaching content, it not only pays attention to the foundation, but also closely follows the engineering application[6-7] .

4.2 Create Mobile Labs and Virtual Simulation Platforms to Broaden the Content, Time and Space of Practice.

For the major professional basic practice courses such as circuit, mode power, digital power, and single-chip microcomputer, develop various experimental teaching aids, experimental equipment, virtual experiment simulation platform, and create a mobile laboratory, so that students' experiments are no longer limited to laboratories and Conduct a fixed time to expand the content, time and space of innovative practice activities to meet the needs of different curriculum practices.

4.3 Integration of Innovative Practice Activities and Experimental Teaching to Cultivate Students' Innovative Application Ability.

With the various types of innovative practice activities such as college students' competitions, college students' innovation and entrepreneurship projects, electronic interest groups, and open laboratories, they actively carry out extracurricular practice activities and build a proactive practice teaching system to enable students' practical ability and innovative ability. Double promotion. At the same time, update and expand the teaching content, explore various flexible teaching methods and means to improve the teaching effect [8-10].

4.4 Construct an Evaluation System for the Whole Process of Practical Teaching, and Effectively Implement the Whole Process Monitoring.

According to different practical teaching links, the corresponding process evaluation system is

formulated to effectively implement the whole process monitoring. Provide effective support for the analysis of the achievement of engineering education certification.

5. Conclusion

Based on the certification of engineering education, the concept of results-oriented is applied to the experimental teaching of electronic technology, and the practical teaching experience centered on students is explored. Establish a diversified teaching model, expand the content, space and time of innovative practice activities, strengthen students' engineering practice ability and innovation awareness training; construct a practical teaching evaluation index system for all-round, multi-angle and whole process monitoring of practical teaching to meet The engineering education certification target has been assessed. In order to play a leading role in the teaching reform of the electronic technology practice course.

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