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Research on Practical Teaching of Basic Information Network Operation and Maintenance Guarantee Courses Based on Situational Teaching

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Abstract

The operation and maintenance guarantee of basic information network is not only a headache problem that has to be faced, but also a problem directly faced by the operation and maintenance personnel. In view of such practical teaching problems, a "three-level" hierarchical and progressive ability standard based on the basic competencies, core competencies and comprehensive competencies of the post in the practical teaching is put forward. An experimental teaching situation is constructed, and a problem-explored experimental teaching method based on theoretical cognition is proposed, so as to solve the theoretical problems that restrict the practical teaching, and improve the teaching effect.

Keywords

Basic information network operation and maintenance guarantee; Situational teaching; Three-level competency standard.

1. Introduction

The overall teaching objectives of basic information network operation and maintenance guarantee courses are as follows: master the equipment operation and maintenance methods of the basic information network, and the system operation and application of the basic information network. Students' professional knowledge and skills can be strengthened. A scientific way of thinking is formed to guide students to apply course knowledge for thinking and solving, so as to improve their practical ability. According to the orientation of teaching objectives and the requirements of syllabus for key points and standards of the teaching content, combined with the reform of the teaching methods, the idea of the experimental scheme is designed.

This topic is guided by the cultivation of practical network operation and maintenance talents, with the basic information network operation and maintenance support as the background, and the application of operation and maintenance support practical skills as the core. The multimedia technology, modeling simulation technology and human-computer interaction technology are applied rationally. Through building a scientifically rigorous, rich content, realistic situation, and convenient virtual training experiment environment, the whole network system structure that is difficult to be displayed intuitively in the actual installation experiment is visualized, and the post experience situation is visualized.

The experimental scheme design is carried out according to the idea of "reality, integrity and flexibility ":

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Reality. This paper starts with the actual structure, actual protocol, and actual parameter configuration specifications of the actual operation of the basic information network. Based on the theoretical knowledge, students can build a layered, sub-regional and divided command information network system through simulation to master structure the and technical principles of the command information network. According to the designed experimental plans through actual failure cases, students can experience the process and methods of troubleshooting, and try to find the best troubleshooting solution repeatedly to exercise students' higher-order thinking in analyzing problems.

Completeness. The project order is the backbone network first and then the access network, the autonomous domain network first and then the autonomous inter-domain network, network configuration first and then operation monitoring, then fault analysis, and finally handling the situation. According to the generation method of the post ability to the basic information network operation and maintenance guarantee, the experimental content of the whole network department, the whole business and the whole process is designed, so as to fully exercise students' comprehensive ability and creative thinking to solve complex problems.

Flexibility. Giving full play to the flexible organization of the virtual training experiment platform cannot only organize the course content flexibly according to the focus of the course teaching purpose, but also the parameters of the entire network can be flexibly configured. The one-key configuration method can also be used to drive the installation network for experimental verification and installation failure reproduction. In this way, students can test and improve the treatment plan, so as to fully exercise the comprehensive ability and creative thinking of them to solve complex problems.

2. The Implementation Process of Practical Teaching

The experimental implementation method in practical is compatible with the theoretical teaching implementation method. Relying on the virtual training experiment system, the theoretical study, post experience and experimental practice are deeply integrated. According to the "three-level" hierarchical and progressive competency standard of the basic ability, core competency and comprehensive ability of the post, the post-experience learning is divided into three stages of "post cognitive experience-post simulation experience-post rehearsal experience". The experimental teaching situations are constructed respectively, and the situational experimental teaching practice is carried out. Finally, a new model of professional situational experimental teaching based on job experience is innovated as shown in Figure 1.

Specifically, according to the purpose orientation of the experimental teaching situation, combined with the three different stages of post-experience learning, three types of experimental teaching situations of "theoretical cognition orientation, skill operation orientation, and job duty orientation" are correspondingly designed. A single experimental teaching situation from the four elements of "situational subject, situational resources, situational space and situational time" is constructed, and a variety of teaching situations are formed according to the optimal combination of experimental purposes. Three types of experimental teaching situations are distinguished to design four stages of "situation construction, situational exploration, situational practice and situational reflection", so as to standardize the organizational procedures of situational experimental teaching. The design of "problem inquiry-based teaching method, action-oriented teaching method and task-driven teaching method" is optimized to integrate the teaching process with the post experience. It can break the traditional teaching form of "theoretical explanation first and practical operation later", highlight the consistency of teaching training and post work process and work flow, and improves the effectiveness and pertinence of talent cultivation.

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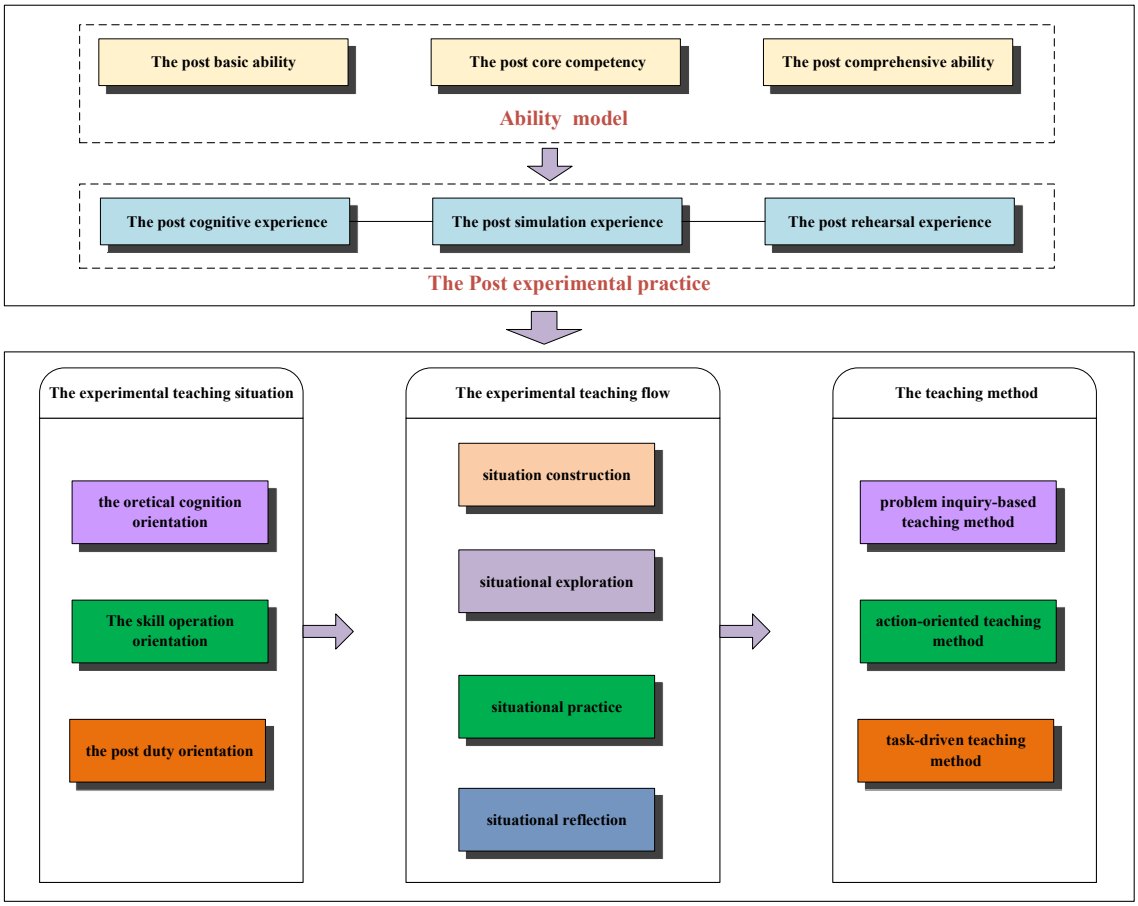

Figure 1. The overall structure of situational teaching research and practice based on job experience

3. Teaching Methods in Practice

The practical teaching of this topic aims at the simulation of the “Two Characteristics and one Degree” standard of "Golden course". According to the teaching method and the experimental method, the experimental teaching method of problem exploration based on theoretical cognition is designed.

“Theoretical cognition based problem exploration ", that is, students can carry out experiments on protocol parameter configuration and single-load operation by simply reading the instruction and guide video without knowing anything about the knowledge. However, it is difficult to obtain ideal score, and sometimes there are unexpected extreme false results. At this time, students will be confused, and then arouse the interest in learning. They explore and discover problems, and think about the causes to propose improvement strategies. The inquiry process has high demands on students, and sometimes they may feel at a loss. As such, the theoretical teaching is changed to students' self-learning before class. Individualized questions are raised by some methods, such as drawing mind maps, and they are discussed and exchanged in class to promote mutual learning, as shown in Figure 2.

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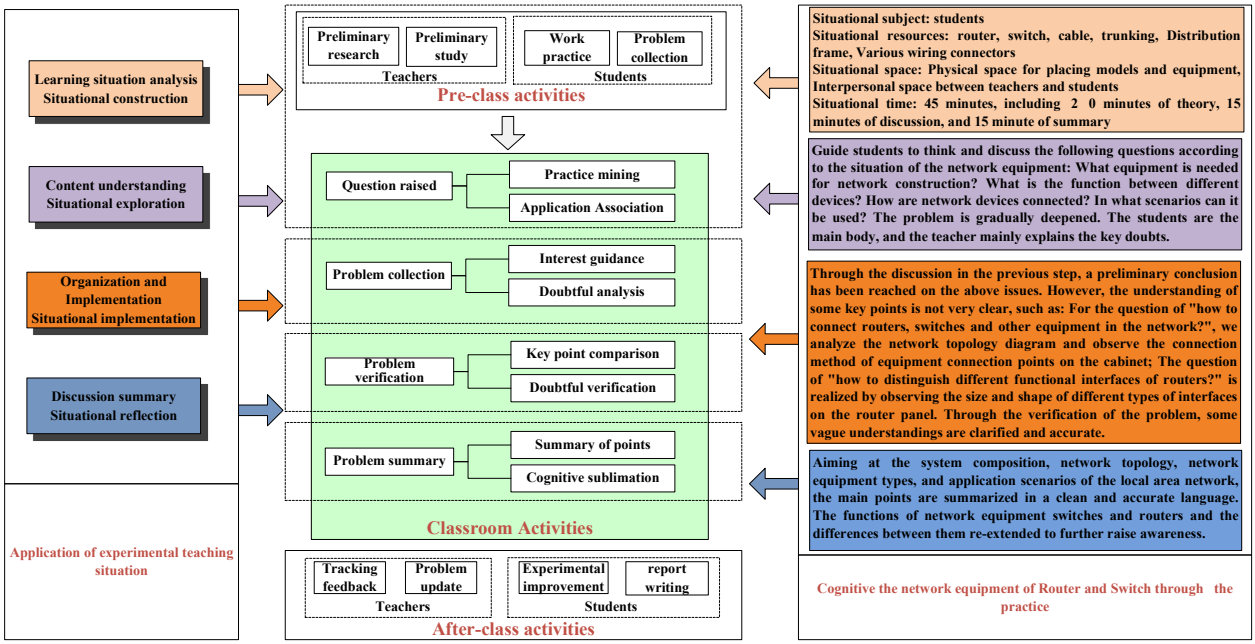

Figure 2. Problem-explored experimental teaching method based on theoretical cognition

Taking the cognitive practice of routers and switches as an example, the application of experimental teaching situations is divided into four stages: learning situation analysis, content understanding in the situational construction stage, organization and implementation in the situational exploration stage, discussion and summary in the situational practice stage, and situational reflection stage. Correspondingly, our classroom teaching activities are divided into three periods: pre-class activities, classroom activities and after-school activities.

In the stage of pre-class activities, the learning situation analysis and the situational construction are completed. Through preliminary research, teachers communicate with students about their own work practices and collect students' questionnaires to complete the analysis of learning situation. The specific content field of the situation is constructed as: the main subject of the situation is students, and the resources include routers, switches, cables, wiring ducts, patch panels, and various wiring connectors. Situational space is the physical space where models and equipment are placed, as well as the interpersonal space formed by teachers and students. In terms of teaching practice allocation, the situational time is 45 minutes in total, including 20 minutes of theory, 15 minutes of discussion, and 10 minutes of summary.

In the classroom activity stage, the teacher guides students to think and discuss the following questions: What equipment is needed for network construction? What is the function between different devices? How are network devices connected? In what scenarios can it be used? The problem is gradually deepened. The students are the main body, and the teacher mainly explains the key doubts to deepen students' understanding of the content and explore the situation. Then, through the discussion in the previous step, a preliminary conclusion is reached on the above issues. Students may not have a clear understanding of some key points. Through the verification of the problem, some vague understandings have been made clear and precise. Finally, the problems of the local area network such as the system composition, network topology, network equipment types, and application scenarios are summarized, and the main points are summarized concisely and accurately. The functions of network equipment switches and routers and the differences between them are extended to further improve understanding. Final summary and discussion are formed for situational reflection.

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In the stage of after-school activities, the teacher should track the students' learning and update the problems. According to the teacher's feedback, the students correct the problems and begin to complete the experimental report.

4. Conclusion

Aiming at the method of practical teaching, this paper designs a "three-level" hierarchical and progressive ability standard based on the basic ability, core competency and comprehensive ability of the post. The experimental teaching situation is constructed, and the problem-based experimental teaching method based on theoretical cognition is put forward to improve students' post-employment ability and the teaching efficiency. The aspects that need to be further improved in the follow-up research lie in the implementation and management of on-site teaching, and the construction of the teaching effect evaluation model.

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