Exploring the Practical Teaching Reform of Network Courses

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ABSTRACT

With the transformation from normal college to applied university, the professional courses of science and engineering pay more attention to the transformation of theory to practice, and practical courses are put in an increasingly important position. Computer Network Courses originally had strong applicability, monotonous teaching methods aren’t more suited to the current curriculum development needs. This article starts from many aspects and tries to analyze and study the practical teaching mode of network courses, so as to improve the teaching quality of these courses in essence so that the teachers can fully understand the theoretical knowledge and at the same time it strengthens the investment in practical teaching, and actively promote students to carry out experimental activities, and finally allow students to absorb and digest heretical knowledge in practice.

KEYWORDS

Applied university; computer network course; practical teaching mode; teaching quality.

INTRODUCTION

Computer network courses include: Computer Network, Network Operating System, Routing and Switching, Network Experiments, Cabling, Network Programming, Network Management and Maintenance, Database Principles And application, network information security and so on. All along, due to various reasons, the teaching process of the above-mentioned courses are generally prevailing theory of light practice, the students’ understanding the content of the curriculum can only be expressed through the language of teachers, but to make practical application is powerless.

With our university transformed to the application-oriented university, the reform of the teaching mode of the curriculum becomes more and more urgent, under the new situation and new environment. Especially as a science and engineering computer class teacher, I can not only meet the transmission of theoretical knowledge to students, but also continue to improve my operational skills and engineering experience, can actively promote students to carry out practical activities, can truly enable students to apply their knowledge and effectively improve the quality of subject teaching.

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ANALYSIS OF THE STATUS

Network courses generally have a strong practicality and applicability, learning network technology, we must first lay a solid theoretical foundation, and then by tireless, harsh practice training, it can be effectively grasped. However, in the current teaching of network courses, there are many situations in which the number of class hours practiced to theory is low, the relationship between each subject is very weak, and the correlation between subjects is feeble. The types of experiment projects are single, the content is aging, and the practicality is not high.

Specific issues are listed below:
(a) Teaching objectives are not clear, practical content settings are not reasonable
The teachers did not grasp the practical teaching content of the course, the experimental project arrangement was sloppy and there was no unified planning and setting. Experimental project content is obsolete, repetition rate is higher. The types of experiment items are single, the total proportion of confirmatory experiments is too high, and the comprehensive and research-based experiment out rate is too low, which directly leads to the students' creative thinking cannot be fully stimulated during the experiment, and the theoretical knowledge cannot be more understood further.
(b) Practice teaching organization less perfect, poor teaching effectiveness
Teachers must be involved in all the students practice activities, monitor and manage practice and operation of the students, actively interact with students and answer doubts, and help students successfully complete the experiment. However, for now, the guiding role of teachers in practice is not fully demonstrated, and students' learning sentiment has not been completely mobilized. And the performance assessment stage of practice is still mainly relied on the calculation of the experimental report, it should increase the point-to-point practical assessment, so as to be more intuitive and more effective grasp of each student's practical ability.
(c) The quality of practical teaching needs to be improved
The quality standard of practice teaching is not perfect, and there are differences with the goal of "all-around and whole-process training and practice" expected by the school. Facilities related to experimental teaching resources need to continue to optimize, and share the laboratory does not do well.
(d) Practical teaching research level is not high, the application effect is not satisfactory
Although in recent years many teachers are or have been engaged in practical teaching research on network related courses, due to the lack of deep and consistent research on the project, most of the project achievements stay in personal practice and publish papers, don't actually apply the research results to practice teaching to test, few promote the use, and truly valuable research results is rare.

THE INNOVATION OF PRACTICE TEACHING IDEAS

As the saying goes, "If you want to get rich, you should first build roads." Similarly, if you want to improve your practical teaching model and improve the quality of practical teaching effectively, teaching staff should well comb the order line and keep improving with the time. In order to solve the problems existing in the practical teaching of the current curriculum, we should brainstorm extensively, listen extensively to suggestions of all parties, actively carry out the reform of practical
teaching, and boldly expand the research results into the classroom to test and to seek truth from facts. Finally, we found a most suitable practice teaching model.

As a full-time teacher who works in the front line of computer teaching for a long time, I think that in order to carry out teaching reform and research on online courses, we must do a good job in the following aspects:

(a) Optimizing personnel training programs to train high-quality personnel

We should carry out in-depth investigation and research to fully understand the needs of the local economic and social development, industries and enterprises for network engineering professionals and make overall plans to meet the basic requirements of cultivating undergraduate talents, professionals and applied talents. We should scientifically formulate a network engineering professional quality standards that have professional characteristics and meets the needs of the society and industry and business ,and actively carry out school-enterprise cooperation and research, determine the professional training objectives, and constantly improve and optimize network engineering talent training programs, the curriculum should give full consideration to the needs of students ‘career development and Personalized development .

(b) Continue to strengthen students' application and innovation ability

The purpose of our practical teaching research is to improve students ‘application and innovation ability. We should continue to improve the practical teaching system, clarify the practical teaching objectives, and cultivate students' scientific spirit of studying hard, seeking truth and being pragmatic, and forging ahead with determination. In practical teaching, students should be proficient in mastering and applying basic technical skills, and should guide and help students to participate in design practice activities and scientific research so as to achieve the goal of learning in operation and research. To strengthen the contact with industry and business, train students’ work ability in different positions as much as possible. It is necessary to strengthen the application and guidance of student innovation and entrepreneurship projects, strengthen the organization and development of various specialized competitions, and continuously improve the comprehensive ability of students. (c) Pay close attention to teaching style construction

"A man who is right that his heart is positive." A good teaching style can promote a good style of study. We should strengthen teaching style building, strengthen teaching management, and strengthen the ethics education so that every teacher can always be full Enthusiasm, rigorous scholarship in practical teaching.

THE CONSTRUCTION OF PRACTICAL TEACHING SYSTEM

Network engineering students should first grasp the basic principles of computer networks, familiar with the composition of the network, proficiency in the configuration of a variety of network equipment, knowledge of network security technology and related applications, and with network management and maintenance capabilities. Therefore, according to the discipline training objectives and professional training requirements, with the main line of improving the students' comprehensive practical ability and innovative thinking, the application content of each subject is decomposed. According to "understanding network", "using network", "maintaining network,” design Network "four step-by-step process , refine the application content to
implement the practice of various departments, and initially proposed as shown in Figure 1 computer network course knowledge system.

In my opinion, through the organic integration of courses, by organizing and screening the application content hierarchically, and arranging the experiment teaching rationally, we can construct a mature teaching system of computer network courses and effectively improve the quality of practical teaching.

THE REFORM OF PRACTICAL TEACHING METHODS

The choice of practical teaching methods will directly affect the students' interest in experimental training class, as well as their practical ability and innovative awareness training. Improving the practice teaching methods can effectively improve the level of practice teaching. After many years of network class practice teaching, I summarize the four basic practice teaching methods: teaching method, demonstration method, group experiment method, task-driven method. Teachers use the teaching method to teach students the theoretical knowledge of the subject, providing theoretical support for future practice. Teachers use the demonstration method mainly for practical teaching content, you can use physical or model operation demonstration, to provide students with intuitive practical demonstration. Group experiment not only exercise students' ability to collaborate, but also develop their team sense, generally comprehensive experiments can use this method. Task-driven method can effectively mobilize the enthusiasm of students, and stimulate their creative thinking. If these four methods can be mastered and continually improved, they will certainly improve the teaching level of teachers and help students to arouse their enthusiasm for learning effectively and effectively.

Figure 1. Computer network course knowledge system.
EXPERIMENTAL PROJECT DEVELOPMENT

The development of the experimental project is related to the quality of the subject practice teaching. In addition to allowing the students to consolidate and strengthen the theoretical knowledge of the subject in the practice, the experimental course should also emphasize the cultivation of creative thinking. The main project I developed was a confirmatory pilot project, which was also partly integrated and designed. Confirmatory experiments is mainly to master the basic knowledge, basic skills, and develop students' practical skills, the process is to allow students to test a known result; comprehensive experiment emphasizes further strengthen the operational capability, But also take into account training to improving the students' ability of logical thinking and comprehensive analysis. The design research experiments emphasize the cultivation of innovative thinking of students and guide students to explore the unknown areas, the process is to allow students to experiment without knowing the premise, Through their own experimental analysis, to explore the conclusions reached after the study.

For example, I have been teaching network-based courses associated with two applications for many years: "Computer Network Experiment" and "Routing and Switching". These two subjects are not only carry out group practice training in the network lab Experimental platform, I also use the virtual network platform to develop a large number of experimental projects, these experimental projects can also allow students to practice after school time. It can also provide a good platform for students to conduct comprehensive and research-based experimental projects.

I use the powerful network simulation software DynamipsGUI to carry out project development. The experiment project is mainly generated by the bat file. It can be operated on all versions of windows operating system without the emulator. It is very convenient and practical. This experimental project can not only be applied to practice teaching in the classroom, but also can be provided for students to experiment after class. Of course, teachers can also explain to students how to use DynamipsGUI software and encourage their students to conduct comprehensive and design experiments in their spare time.

After several semesters of classroom promotion and application, this set of experimental projects that I developed has been successfully applied to the curriculum practice teaching activities and students' extracurricular practical training. The enthusiasm of students engaged in practical activities has been greatly stimulated and the practical operation ability has also been increasing day by day.

ORGANIZATION AND MANAGEMENT OF PRACTICE TEACHING

In the process of network class practice teaching, for the confirmatory experiment based on disciplines, I will require the students to complete independently and adopt the point-to-point guidance during the experiment, and I will give pointers and help students solve the problems encountered in the experiment. For the practice of comprehensive experimental project, I usually choose group experiment method, each group of students according to the strength of men and women and practical ability to match evenly, and select someone has strong organizational skills and practical experience as a group leader, The leader of the experiment overall assignment of each student's task in the process of the, and give a preliminary assessment of the team
members after the completion of the experiment, and finally submitted to the teacher's test results, the teacher will evaluate it based on the completion of the experiment and the cooperation of group members and give the final result of this experiment. Practice has proved that such a management mechanism is feasible and effective. The students laid a solid foundation in the practical operation of the confirmatory experimental project, and further developed and sublimated in the practical exercises of the comprehensive experimental project afterwards. Moreover, in the group experiment, everyone deeply understands the importance of teamwork, cultivate collective awareness, and further enhance the feelings of each other.

**TEACHER TRAINING**

In order to effectively improve the practical ability of teachers of network engineering, especially teachers of computer network courses, we should pay attention to two aspects:

A. Increase teacher training. In order to effectively improve teachers' practical skills, we should actively organize our teachers to attend higher level schools or companies for professional training. Teachers should also be encouraged to attend various national or international conferences related to professional research. Teachers should also be urged to actively obtain computer networks certification.

2. Training "double teacher". "Double-teacher" is a comprehensive talent with teaching ability and engineering experience, which combines the qualifications of teachers and professional ability. "Double-qualified" teachers have great help to improve the level of practice teaching. Therefore, the course teachers in online courses should greatly improve their engineering practice ability and acquire proficiency in practical professional skills, so as to truly have the ability to guide students in practical activities and innovative research.

**CONCLUSION**

In summary, many current network teachers in colleges and universities do a large number of practical teaching research, according to their own circumstances and the environment, but also made a lot of very valuable research results, which provides valuable experience for other institutions and teachers who are conducting similar researches. However, the teaching environments in different schools are not the same, and the theoretical research level among teachers are different. Taking full domination can only make ends meet. Therefore, we should identify our positioning, carry out practical teaching and research down-to-earth with their own actual situation to understand a set of practical teaching methods, so as to meet the educational philosophy of the transformation and development of our school, only in this way can we keep pace with the rapid development of higher education in order to keep improving the teaching quality of network courses in order to further improve the gold content of network engineering.
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