

Teaching exploration of computer network courses for non-computer specialty in the background of "new engineering"

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Abstract: With the construction and development of "new engineering subject" and the popularization of computer network, it is more and more important for non-computer major students to master certain computer network technology. Combined with the existing problems in the teaching of computer network courses for non-computer majors in colleges and universities under the background of the construction of "new engineering subjects", this paper probes into how to carry out the teaching effectively, and puts forward corresponding solutions.

Keywords: New engineering; non-computer major; computer network; curriculum; teaching

Introduction

In February 2017, the Ministry of Education issued the "notice of the Department of higher Education of the Ministry of Education on the Research and practice of the New Engineering subject." the new engineering subject was summed up as "five new", namely, the new concept of engineering education and the new structure of discipline and specialty. The new mode of talent training, the new quality of education and teaching, the new system of classified development^[1]. Compared with the old engineering subject, the "new engineering course" emphasizes the practicability, intersectionality and comprehensiveness of the subject, especially the close combination of the new technology such as information communication, electronic control system, software design and traditional industrial technology. It is for this reason that we should speed up the construction and development of "new engineering subjects" and train them. It has become the consensus of the whole society to train the talents who are in urgent need of the new economy and to lead the development of technology and industry in the future.

With the development of global informatization in the 21 century, computer network plays an increasingly important role in the construction of "new engineering subject". Computer network technology is one of the skills college students must master. The "computer network" course of non-computer major has been listed as one of the six core courses of computer foundation by the teaching guidance committee of non-computer major of the Ministry of Education. That is to say, computer network course is not only a professional course for computer students, but also a required course for non-computer majors. Computer network As a specialized course in computer or communication related field, the course has higher requirements for students' theoretical knowledge, practical ability and applied skills, which is difficult to understand for non-computer majors. Low interest in learning, teaching hours and other problems. Therefore, the actual effect of teaching is not ideal. How to make students master the basic theory and practical skills of computer network is a problem worth discussing. On the basis of summing up the previous teaching experience, this paper explores the teaching of computer network course.

1. Teaching situation and existing problems

Computer Network Course is a course that combines theory with practice. In most colleges and universities, com-

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puter network course mainly describes computer architecture, LAN, IP protocol, routing protocol, transportation.

The basic functions of the layer are related protocols and application layer protocols. The seventh edition of Computer Network, edited by Xie Xiren and published by Electronic Industry Publishing House, is the most widely used and authoritative classical teaching material of computer network at home and abroad. This paper introduces the development of computer network and its principle architecture, physical layer, data link layer and network in a comprehensive and systematic way. Network layer, transport layer, application layer, network security, audio/video services on the Internet, wireless network and next generation Internet.

The traditional computer network course is a computer or communication related professional courses, content settings and textbooks are mostly for computer undergraduates, lecturers are mostly professional teachers of computer courses, teaching content, teaching requirements and teaching methods are mostly referring to computer related professional settings^[4]. For non computer majors, learning will encounter greater difficulties. Therefore, it is a difficult problem for teachers to explain the concept and principle of computer network clearly in the limited time under the background of "new subject" construction. The author has found some problems in the teaching process, such as students' interest is not high, the theoretical content of teaching is too strong, class hours are short and so on. The following is a summary of these problems.

1.1 Students lack interest and learning attitude is not right

Most non-computer majors feel that the course of computer network is not their professional course, and they are not computer majors themselves. The degree of attention and learning attitude to the course can not be compared with the major at all.

Classes are mentioned in the same breath. Most students learn the course with the attitude of handing in a gap and coping with the school's credit system and examination. Therefore, students' learning attitude is not correct, and their enthusiasm and initiative are not enough.

1.2 The theoretical content of teaching is too strong

Computer network courses are mainly about communication theory and various wireless protocols, these things are very theoretical, trivial knowledge points. This is for non computer majors who lack relevant background knowledge.

What's more, the course is boring and abstract, and it is difficult to connect the theory with the actual network, which leads to the students' unclear learning purpose^[5]. It also attacked the interest of non computer majors in this course.

1.3 The course is short and students have no chance to practice

Computer network course is a very practical course, it not only needs to learn the basic theoretical knowledge of computer network, but also to learn the actual operation. However, some colleges and universities do not offer experimental classes in the training programs for non-computer majors, which leads to the disconnection between teachers' explanation in class and students' practical operation. Besides the unsatisfactory teaching results, students will lose interest in learning computers^[6]. For example, the author's school has both computer and communication majors. Theoretical course 40 hours, and 30 hours of computer experiments, non-computer majors not only did not arrange for computer experiments, but also the theory class time is only 32 hours. This leads teachers to teach students a lot of boring theoretical knowledge in a short period of time, and makes students lose interest in computer networks.

1.4 The assessment is not comprehensive enough

For non-computer majors, we should pay attention to the practical operation ability and application ability. The traditional examination method only makes the students learn a lot of boring network principles and theories by rote, which results in the students' learning.

For the exam, the exam is completely forgotten^[7]. However, most colleges and universities only examine the computer network courses for non-computer majors by examination papers, which leads to the students to cope with the school's examination system.

Get the corresponding credits, only rote learning theory, can not combine theory with practical application. At the end of the exam, the content of the course was forgotten, and at last, the students got nothing on the computer network course. This has lost the significance of offering this course for non computer majors.

2. Exploration of Teaching Reform

In view of the problems existing in the above teaching process and the background of the construction of "new engineering subject", this paper probes into the solutions to the problems.

2.1 Content should be gradual

"New Subject" emphasizes the practicability, cross-cutting and comprehensiveness of the subject, so teaching computer network courses for non-computer majors can not finish the history of computer development on the direct teaching of professional knowledge. For non-computer majors, computer system elements, the various protocols are obscure. Teachers directly explain these knowledge points, will make students feel boring^[8], not only can not play a good teaching effect, but also let students lose interest in computer networks. Therefore, teachers in teaching should step by step, starting from the practical application and the intersection of various disciplines, by telling one Some practical knowledge, such as the difference of computer system, the knowledge of network virus, system protection, data recovery and so on. At the same time, it explains some relevant knowledge of computer network and students' specialty. Attract students' attention and improve their interest and enthusiasm.

2.2 Promotion of students' interest in learning

Interest is the best teacher. For the abstract and boring computer network, interest is the main driving force of students' active learning and the main factor influencing the learning effect. At present^[9], computer network courses usually use the network architecture "bottom-up" to explain the teaching model layer by layer, but, For non-computer major students, they are exposed to the abstract network knowledge from the beginning, and they do not have the basic knowledge of computer and communication, which makes the students lose their positive learning easily. Therefore, we adopt a top-down teaching sequence, starting from the application layer, from the network application that students can often contact, and then to explain it layer by layer. Let students know what they are and why they want to know. They always have an interest in seeking knowledge. They can understand the phenomenon of network so as to improve the teaching effect.

2.3 Innovative teaching methods and techniques

"New Engineering course" emphasizes innovative teaching methods and techniques^[10]. Such as interactive multimedia and mobile terminal platform, big data technology, the use of MOOC, SPOC, flip classroom, micro-classroom, rain classroom and other teaching methods to help classroom teaching. Therefore, in the teaching process of computer network course, the author makes full use of the modern teaching and learning means such as flipping class and micro classroom, etc. The abstract knowledge points, working principle and flow in the course are animated by slides. Mobile phone to demonstrate, subvert the traditional mode of teaching, let students participate in classroom teaching, stimulate students' interest in learning, thereby It effectively breaks through the teaching difficulties, enhances the teaching effect, enriches the teaching contents and enlivens the classroom atmosphere.

2.4 Improving classroom teaching efficiency

Short hours are not a hindrance to a good computer network course. Because the class is short, teachers should cherish the time of each class and make good use of each minute of the class. You should plan the tasks to be completed for each class before class, and even plan what to teach every quarter of an hour. The contents of each class should be arranged well in advance, and the content of computer network should be described in image and meticulous, so as to improve the efficiency of the class.

3. Summary and Prospect

Based on the author's teaching experience and the basic idea of the construction of "new engineering course", this paper analyzes the problems in the teaching of computer network courses in non-computer majors and the improvement measures. At present, new technologies and new concepts in the fields of "Internet"^[11], wireless network, network security, etc., are emerging in endlessly. It is necessary to establish new computer teaching guidelines and ideas, and to get rid of the shackles of old teaching ideas and teaching contents. Take the student as the center, take the social demand as the standard, carries out the reform according to the "new engineering subject" construction request, diligently trains the practical specialized talented person.

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