Teaching Reform of Computer Network Course Based on Cultivation of Innovative Ability

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Abstract: As the soft power of national power competition, school education must meet the requirements of the times, cultivate talents with innovative spirit and creativity to adapt to the development of the times, and enable them to master the abilities of lifelong learning, cooperative learning and autonomous learning to adapt to the needs of the society. Based on this, this paper puts forward a research on the teaching reform of computer network course based on the cultivation of innovative ability. The reform of the teaching mode of computer network courses can start from practical teaching experience, specifically including the reform of teaching concepts, teaching contents, teaching methods and teaching means.

1. Introduction

With the rapid improvement of social science and technology, computer technology is developing at a faster and faster speed. The rapid update of computer technology requires that the cognitive level of computer major students be improved rapidly [1]. However, as the development speed of computer network far exceeds the update speed of computer network teaching, the society has higher requirements for the knowledge learned by students [2]. There are some problems in the teaching of "computer network" course, such as the separation of teaching content from reality, the teaching mode not adapting to the characteristics of the course, and the weak links in experimental teaching. Under the new situation of the development of modern society, in the teaching process of computer network courses, in order to better meet the actual teaching requirements and needs, computer network course teachers should combine the cultivation of students' innovation ability, and on this basis, implement teaching reform with effective ways and measures, so as to improve the teaching quality.

2. Teaching Reform of Computer Network Course Based on Cultivation of Innovative Ability

In the process of social development, many institutions of higher learning do not pay enough attention to innovative education, which affects the enrichment of curriculum teaching results and the improvement of students' learning level. There are still some reform problems in the teaching of higher computer network courses:

2.1 The Teaching Concept of Computer Network Course is Backward

Whether the teaching reform of computer network course goes smoothly and deeply is influenced by the teaching and learning concepts of teachers and students. In the development process of colleges and universities, many teachers believe that as long as the basic teaching is completed and the students' professional ability is cultivated, the goals of higher education are achieved, and whether the students have innovative ability has nothing to do with themselves. In the computer major, the experiment class is a very important part of the content. We mainly train students' practical ability and innovation ability through experimental classes [3]. The basic parts of the computer experiment course are the same, and there are many intersections, but there is a lack of a comprehensive and comprehensive experimental system. In an era when computer networks are increasingly widely used, it is necessary for computer network teachers to carry out teaching reform

and to infiltrate the cultivation of students' innovative ability into the reform of computer network courses. As far as the actual development of colleges and universities is concerned, many teachers think that as long as the basic teaching can be completed and the students' professional ability can be better cultivated, the teaching objectives of higher education can be completed, and the students' innovative ability cannot be paid more attention and recognized. This has affected the combination of the cultivation of innovative ability and the teaching reform of computer network courses. In addition, in the current teaching process of computer network courses, not only teachers' concepts are relatively backward, but also many students lack attention to the cultivation of self-innovation ability in the learning process. The existence of these factors will have adverse effects on the development of teaching reform, affect the effect of teaching reform, and ultimately affect the quality of teaching.

2.2 Traditional Teaching Methods of Computer Network Courses

Influenced by traditional teaching ideas and modes, the application of indoctrination teaching methods in Chinese higher education is still relatively common. Most teachers of higher computer network courses have great confidence in the traditional teaching methods and believe that the teaching methods used by the Chinese nation for thousands of years are without any backwardness and problems [4]. Due to the limitation of experimental hours, it is difficult to form special experiments, which is not conducive to the improvement of students' comprehensive practical ability. In view of the above practical teaching situation, we must actively explore the practical teaching reform of computer network courses and carry out bold practice. The reform of practical teaching should start with innovation. Computer network textbooks cannot be regarded as teaching contents or as the masters of teaching activities. Students should be taken as the main body to promote the development of their main body through mutual communication, positive interaction, common interpretation of textbook contents, common discovery of problems and solution of problems. Therefore, there are many specific contents of the protocol taught in the classroom, but the connection between the protocols, the methods and technologies adopted by the protocols are relatively lacking in understanding the essence of the protocols. Students' understanding of the basic principles of computer networks is often based on the memory of the specific contents of various protocol specifications.

2.3 The Teaching Content of Computer Network Course is Single

The teaching content is the basis for the implementation of teaching activities. Whether the teaching content of computer network courses in institutions of higher learning is rich or not has a direct impact on the formation speed of students' innovation ability [5]. In teaching, most teachers of higher computer network courses rely too much on teaching materials. In teaching, teaching materials are used for teaching materials, ignoring the cultivation of students' innovative ability. Innovative education requires teachers to influence and drive the formation and development of students' innovative ability with their own innovative consciousness, innovative thinking and innovative ability in the process of innovative education. In the actual teaching process, because the teaching content is relatively single, carrying out the teaching under such circumstances will lead to the teaching content being rather dull and abstract, causing students to show negative attitudes in the actual learning process. Students are often in a fog in theory class. In experiment class, they continue to touch the image of the blind person. They always see the world through a layer of gauze and cannot see clearly. Finally, they do not have a clear understanding of the theory and are unable to solve the actual network problems. Causes the student to produce the negative computer network curriculum knowledge attitude. The teaching content of computer network courses used in many institutions of higher learning is an introduction to computer products, which is too superficial for students to find innovations.

3. The Importance of Cultivating Students' Innovative Ability in Computer Network Teaching

3.1 The Cultivation of Innovative Ability Can Meet the Needs of School Education Development

With the continuous development of modern quality education, the society is paying more and more attention to the quality of school education and the mode of personnel training. In the era of knowledge economy, only people with innovative consciousness, innovative spirit and innovative ability can make achievements. We should actively change the traditional examination-oriented education mode and concept, pay more attention to the cultivation of students' practical ability and innovative ability, and take the cultivation of innovative practical talents as the development direction of education and teaching. Paying attention to the cultivation of students' innovative ability and practical ability, and taking the output of talents with strong innovative and practical ability as the direction of teaching development, are not only the requirements of the national implementation of quality education, but also the needs of the long-term sustainable development of school education.

3.2 The Cultivation of Innovative Ability is a Basic Condition for the Construction of an Innovative Country

With the rapid development of modern social economy and science and technology, innovation consciousness and innovation ability have become important contents and influencing factors in the promotion of the country's core competitiveness. This course is a cross-discipline of computer technology and communication technology. It has strong theory, wide range of knowledge, wide application and strong practicability. It is recognized as a relatively difficult course to carry out teaching. The computer network information technology is developing and progressing at a high speed, but the teaching materials are relatively backward and cannot keep pace with the times. At the same time, our country also pays more and more attention to the development strategy of rejuvenating the country through science and technology and strengthening the country with talents in the process of development. It requires that in the process of social and economic development, we should pay more attention to the promoting role of human resources in economic development, and make clear the importance of cultivating talents' independent ability in the process of building an innovative country. Educational innovation is as important as theoretical innovation, system innovation and scientific and technological innovation, and education should also provide knowledge and talent basis for all aspects of innovation. We should take students as the main body and promote the development of students as the main body through mutual communication between teachers and students, positive interaction, common interpretation of textbook contents, common discovery of problems and solution of problems. To form a suitable environment conducive to the cultivation of students' innovative thinking and innovative ability.

3.3 The Cultivation of Innovative Ability Can Realize the All-Round and Sustainable Development of Students

In the process of computer network teaching in colleges and universities, paying attention to the cultivation of students' innovative ability is not only an inevitable demand in the development of school education and social development, but also an inevitable demand in the improvement of students' comprehensive ability and the cultivation of students' self-development ability, which plays a very good role in promoting the comprehensive and sustainable development of students. To fully respect each student, one cannot evaluate a student by a certain fixed standard, fully discover the bright spots of each student, and give full play to the special talents of students with different personalities. Form a lively student-centered learning situation. It is clear that the cultivation of talents' independent innovation ability is important for our country to build an innovative country. As large as a country and as small as an enterprise, there is no doubt about the role of talents. Many students have completed the computer network practice course and need to pay someone to come to

their home to set up a home LAN. If the network in their home fails, they will only call the service provider, which is a failure of education. In the teaching process of computer network courses, through the cultivation of innovative ability, students can be encouraged to think for themselves better, which is conducive to students' independent exploration. It can not only enable students to better master relevant teaching knowledge and save energy, but also enable students to expand their thinking, which is conducive to students' continuous improvement in future study and work, and promote students' sustainable and good development [6].

4. Teaching Reform Strategy of Computer Network Course Based on Cultivation of Innovative Ability

4.1 Updating Teaching Concepts

In the actual teaching process, teachers often teach concepts, definitions and methods in the course one by one, such as router selection, application program algorithm and data conversion technology, strictly according to the textbook content from shallow to deep, from physical layer to application layer or from top to bottom. Teaching activities are bilateral interactive activities between students and teachers. The whole teaching process involves teaching concepts, teaching objectives, teaching tasks and teaching environment. To cultivate students' innovative ability in the process of computer network teaching, the teaching concepts and teaching concepts must be changed first. As modern university teachers, they should realize the importance and significance of students' innovative ability to their future growth and development, actively learn advanced teaching concepts, change traditional teaching thinking, and affirm students' new ideas in the actual course teaching process. Only on this basis can teaching methods, teaching contents and teaching environment be changed. In the teaching of computer network courses, students should not only be instilled with relevant basic knowledge, but also pay attention to the latest teaching trends and developments in the field of computer network, and pay attention to the analysis of the specific requirements of society and enterprises for students' practical ability and innovation ability. The new concept and application of computer network are quickly, scientifically and reasonably integrated into daily teaching, so that students can feel that computer network technology plays an important role in real life, which can greatly stimulate students' interest in learning and broaden their horizons.

4.2 Reform of Teaching Content

The professional reform of teaching content should not only focus on the computer specialty, but also on other specialties related to computer specialty knowledge [7]. More importantly, the school must adjust the arrangement and setting of the course content according to the updated and optimized teaching content, so that the teaching content and the course arrangement can be closely combined and the comprehensive and comprehensive reform of the computer network course content can be truly realized. Please refer to Table 1 below for the specific curriculum arrangement.

Table 1 the Reformed Course of Computer Network

Course name	Class hour	Nature of curriculum	Class object
Principle of computer network	65	Basic course	Computer science
Network Information Security Technology	31	Basic course	Computer science
Computer network engineering	40	Professional courses	The direction of computer professional network
Advanced Network Technology	40	Professional courses	The direction of computer professional network
Advanced Programming Technology	40	Professional courses	The direction of computer professional network

Many schools are making great efforts to respond to the national reform in the teaching of computer network courses and have taken many measures to promote the development of the

reform in the teaching of computer network courses. However, in terms of teaching content and curriculum arrangement, there are still deficiencies [8]. Curriculum reform is an important link in our country's teaching reform. Teachers should try their best to meet the requirements of our country's industrial development in the process of selecting teaching contents. At the same time, we should also grasp the requirements of our market for skilled talents and take the actual needs of the industry as the starting point. In the actual teaching process, teachers should guide students to master a solid theoretical basis, so as to enable students to better carry out the next step of learning. Secondly, the computer network experiment template takes the cultivation of students' innovative ability and practical ability as the orientation. Therefore, the national and local education departments must attach great importance to this. Academic experts have made in-depth understanding and analysis of the current computer network courses, and comprehensively updated the teaching contents according to the actual situation of the urgent demand for talents in the current computer industry, so as to ensure that the teaching contents can keep up with the pace of social development. This paper studies the construction of various specific network application systems and the programming of application software by using systems engineering methods. The teaching content should form the logical framework of the system on the basis of the analysis of the computer network system. Through the analysis of the essential problems and concepts, the students can not only learn the relevant knowledge, but also learn the methods of analyzing the problems.

4.3 Reform of Teaching Methods and Means

It is very necessary for teachers to completely update their traditional teaching methods and means, instead of focusing on the teaching of basic knowledge, teachers should focus on linking theoretical knowledge with practical operation and strengthening practical exercises. An efficient task-driven teaching mode and a sharing mechanism under the teaching platform have been established (see Figure 1). To carry out the introduction, heuristic, self-study, question-and-answer communication and other teaching methods to cultivate engineering innovation ability.
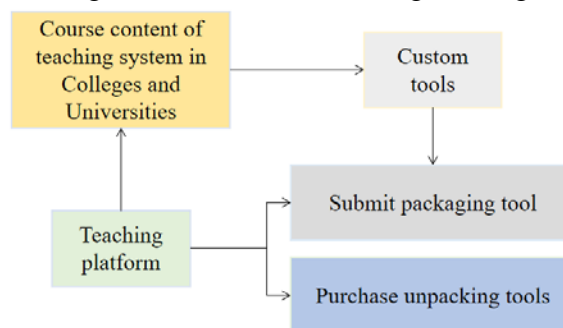
Fig.1 Sharing Mechanism of Teaching Platform

In the era of computer network teaching reform, a considerable number of teachers continue to use traditional teaching methods and teaching methods to teach the teaching content in general in class [9]. Teachers can choose some experimental tasks of verification, research and independent design to train students' experimental skills of network analysis, design, management and application, and improve students' comprehensive quality and ability when they assign independent practical tasks. In the process of classroom introduction, teachers can let students express their related problems in the daily application of the network, and realize classroom introduction while solving the problems. Secondly, teachers of computer network courses should make full use of classroom discussions. In the process of teaching, teachers' leading role and students' subjectivity should be brought into full play, and students should be taught in accordance with their aptitude and tailored to suit their needs. On the one hand, students' personal interests and ideals are respected; on the other hand, reasonable training plans are formulated in a down-to-earth and realistic manner. In this way, the teaching of the following principles will achieve twice the result with half the effort. For example, students often share the Internet through hubs in dormitories, but do not understand the principle. Through the introduction of this part of the content, students initially know what is a

local area network and what is the function of a hub. In the process of teaching the content of network programming, teachers can encourage students to fully understand the concept of programming through autonomous learning, so that they can master the relevant basic knowledge, and on this basis, explain the programming methods to students, also can enable students to share their ideas, make classroom teaching more active, and then obtain ideal teaching effect.

5. Conclusion

In the current teaching process of computer network courses in colleges and universities, the cultivation of innovative ability has become an important task and content, and the teaching reform is conducive to the realization of this goal. Through the reform of teaching methods, we will explore teaching methods and teaching methods that are conducive to arousing students' enthusiasm, initiative and creativity, so that students can master the basic concepts of computer network, network hardware composition, typical network operating system and architecture, and basic communication principles. The aim is not only to enable students to master the basic concepts and basic communication principles of computer networks, but also, more importantly, to enable students to master the thinking and basic methods of dealing with complex problems, and to cultivate students' ability to discover problems, solve problems and innovate. The cultivation of innovative ability is feasible in the process of talents cultivation in colleges and universities, which has played a positive role in promoting the quality of talents cultivation. As the main position of cultivating technical talents, colleges and universities need to continuously carry out reform and innovation, strengthen the cultivation of innovative ability of talents, and promote the improvement of the overall level of innovation in our country.

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