Teaching Exploration and Practice of Communication Principle under the Background of Provincial First-Class Curriculum Construction

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Keywords: Provincial First-Class Curriculum, Communication Principle, Blended Teaching.

Abstract: The course of "communication principle" is an important basic course for the major of electronic information, which has the function of connecting the preceding and the following. The course is both highly theoretical and systematic, as well as highly engineering and practical. In the context of the construction of "provincial first-class courses", teaching reform on how to combine the traditional offline teaching with the information-based online teaching to build a deep, difficult and challenging online-offline mixed "gold course", is an important subject worthy of discussion.

1. Introduction

It is proposed in "The implementation of first-class undergraduate course construction" of The Ministry of Education that courses are the core elements of personnel training, so the quality of courses directly determine the quality of personnel training. The major of communication engineering in our school has passed the professional certification of Chinese engineering education, being approved as the first-class professional construction site at the national level. The course of "communication principle" is the most important basic course for communication engineering specialty. In the teaching process of the traditional modern communication principle course, there are some problems such as the emphasis on theory teaching, the neglect of practical training, the lag of the concept of engineering education personnel training, the difficulty for students to combine theory with practice, and the lack of ability to solve practical engineering project problems. Therefore, the important topic is put forward on how to use the new education idea to combine the traditional teaching and the information-based online teaching organically and carry on the curriculum teaching pattern reform.

2. Key Problems in Curriculum and Teaching Reform

Modern communication theory is a very important basic course for information and communication majors. The emphasis of its teaching is to let students understand the basic concepts and principles of communication system and master the relevant analysis methods. With the theoretical content, the abstract concept of communication system and many formulas involved in the principle analysis, students are required to master the basic knowledge of higher mathematics, signals and systems. In the traditional teaching method, the students have some problems such as low study enthusiasm and feeling bored in the learning process.[1] The problems are as follows:

2.1. The Teaching Method is mainly "Teaching", Lacking the Participation and Interaction between Teaching and Learning

The students need higher mathematics foundation for the more theoretical content and the more deduced formulas involved in the principle analysis. The classroom teaching is mainly focused on mature theories, so it is difficult for students to combine abstract principles with engineering practice and solve problems in communication engineering practice. Due to Lack of interest in learning, low students' enthusiasm and classroom efficiency, it is not conducive to the mastery and flexible use of knowledge and the development of students' thinking ability.

  DOI: 10.25236/ehmit.2021.001

2.2. Online Resources not being Used effectively

Students take the MOOC video as a preview resource, which is not conducive to the development of knowledge and the cultivation of students' ability of analyzing and solving problems.

2.3. The Single Course Evaluation Mechanism

The results-oriented assessment method can neither objectively and comprehensively reflect students' learning performance in the learning process nor take into account students' online performance in autonomous learning. Then students appear inattentive at ordinary times, assault before taking an examination and the undesirable phenomenon that takes an examination to forget light completely.

2.4. Engineering Application

The background of engineering application is prominent, and the traditional teaching methods can not fully demonstrate the combination of theory and engineering practice, which is not conducive to training students' ability to solve complex engineering problems in the field of communication.

2.5. The Teaching Content is not Thoroughly Analyzed and the Course Ideological and Political Cut-in is Isolated

The teaching method is not abundant and the course ideological and political effect is boring, which is not conducive to the training of successors with innovative ability, dialectical thinking ability, national feelings and responsibility.

3. Innovative Design of Curriculum Teaching

According to the characteristics of the course "communication principle" and the teaching objectives of "value-building, ability-training and knowledge-imparting", the hybrid teaching method of "communication principle" based on output-orientation is explored. Therefore, some reforms and explorations from the aspects of arousing the student innovation consciousness, optimizing the teaching content and exploring new teaching methods have been carried on in this article.

3.1. The Online-offline Hybrid Teaching Model Adopted to Highlight the Principal Position of Students

The combination of classroom teaching and network teaching can complement each other. The traditional classroom teaching mainly highlights the leading role of teachers and emphasizes the guidance of teachers. The network class highlights the student's main body status, emphasizes the student's independent study, checks the flaw to make up the deficiency. Therefore, the combination of online and offline can well complement each other's advantages, reasonably guide students to interact with independent study after class, let students put more energy into independent study and train students to develop good study habits. At the same time, do a good job of self-study after class will also have a good classroom teaching effect.

The online resources of this course include all the teaching resources of the self-built provincial excellent sharing course resource website and the self-built MOOC teaching resources.[2] In the online-offline hybrid teaching mode, the students complete the preview and review to fill in the gaps according to the extra-curricular tasks assigned by the teachers. Teachers mainly teach the key points and difficult points of knowledge, answer questions where students do not understand, and organize students to better understand the knowledge in-depth discussion. During the period, teachers release the learning content and requirements on the information-based Network Platform (learning pass, rain class, etc.). Students understand the relevant knowledge points according to the materials provided by the teachers on the network platform and think independently and complete the homework preparation. In the class teaching, teachers emphasize the key points and difficult

contents, and carries on the exercise explanation, organizes the class discussion and the question solution. Teachers may teach the related content according to the student's preview situation. In the process of classroom teaching, teachers can use information technology for teacher-student interaction, such as classroom sign-in, answering, quizzes. During the after-class review stage, teachers release homework and open discussion topics through the information platform for communication between students and teachers. With the help of teaching resources such as courseware and video provided by teachers on the network platform, students can review the knowledge they have learned, make up the gaps, and finish the homework assigned by teachers independently. According to the completion of students' homework, teachers should understand the students' knowledge, and give feedback and adjust the teaching. In the actual teaching process, the division of each teaching link is not absolute and invariable, which can be adjusted appropriately. The aim is to meet the teaching demand, improve students' learning ability and then enhance the teaching effect.

3.2. Ideological and Political Elements Integrated into Curriculum Teaching to Stimulate Students' Innovative Consciousness

The ideological and political system framework of the curriculum is constructed based on the curriculum characteristics, mining the ideological and political elements of the curriculum. The Great Nation craftsman spirit can be cultivated by introducing the communication technology scene into the teaching process and integrating the industry development technology during the course teaching. The sense of innovation is stimulated by introducing the development of communication at home and abroad, highlights the frontier of application. Students can be guided to establish a sense of patriotism through introduction of the country's leading communications technology.

3.2.1. Building Cultural and National Self-confidence

It is an important teaching content in the introduction part of "communication principle" to Introduce the development history of communication technology to students. After introducing the ideological and political elements of the curriculum, the teaching methods of the purely technical route are improved. With the unremitting efforts of several generations of scientists and engineers in the field of communications since the founding ceremony of the People's Republic of China, China's communications industry has got rid of the predicament of relying on technology import and equipment import and development, becoming the world's communications technology and equipment export power.

3.2.2. Cultivating Patriotism

In the course of teaching the "principles of Communication", the stories of Chinese communicators who are devoted to scientific research should be interspersed, arousing students' patriotic enthusiasm and feelings of serving the country by introducing the stories of the most representative patriotic scientists and entrepreneurs.

3.2.3. Learning the Spirit of Science

In the course of "principles of Communication", the scientific spirit of pursuing truth and challenging authority can be imparted to students by tracing the history of invention of important scientific principles.

3.3. Optimizing the Content of Theory Teaching and Perfecting the System of Practice Teaching

The optimization of the course teaching content should be carried out according to the requirement of the combination of detail and emphasis and the explanation of the basic theory. With the rapid development and wide application of digital communication technology, the emphasis of teaching should be focused on digital communication and new modulation and coding technology. For example, when teaching modern modulation technology, the 5G new modulation technology can be introduced, reflecting the teaching content with the Times.[3]

In the aspect of experiment teaching, the application of knowledge should be emphasized, and the simulation software of Matlab and System View can be introduced into the teaching, which increases the comprehensive and designing experiment.[4] By means of hardware platform and software simulation, this course combines theory knowledge with practice through three stages: principle verification experiment, simulation design experiment and comprehensive innovative experiment. Students' ability to apply knowledge flexibly can be Cultivated, students' ability of practice and innovation improved. In order to improve the comprehensive application ability of the students, a comprehensive communication training course has been set up. In addition, students are encouraged to apply their knowledge of modern communication principles to participate in various university competitions actively. Through participating in the competition, students can deepen their understanding of the knowledge they have learned and improve their comprehensive application ability and independent innovation ability.

3.4. Exploring the Task-driven "Communication Principle" Hybrid Teaching Method

Four aspects are include as follows:

3.4.1. Design of Teaching Task

Task is an important part of instructional design. Each task is like a tie, interspersed with teaching activities. Students acquire knowledge and skills through "task", internalizing knowledge, exploring the unknown, stimulating interest, and cultivating students' self-learning ability and innovative spirit.

3.4.2. Online Instructional Design

By improving the learning resources of the "communication principle" MOOC platform, the and post-class Homework related test questions should be designed according to the "task" to enhance the learning challenge and innovation. Students need to study online before class, preview related electronic resources independently, complete the homework, and feedback the problems encountered in the process of preview, so that teachers can arrange the teaching content and teaching methods of offline learning.

3.4.3. Design and Organization of Offline Teaching

Multi-modal teaching method is adopted to design and organize classroom teaching according to "task". Based on the important and difficult points of the course and combined with the knowledge points related to the tasks, students can be helped to construct the logicality and relevance of knowledge within and between chapters so that students can master learning skills and methods, access to common law to find ways to solve the problem. By combining the teaching means of Blackboard Writing, multimedia teaching, special software simulation, visual teaching platform, micro-class and rain class, the teaching methods such as direct method, case method, discussion method, demonstration method, practice method and experiment method, are adopted to enable students to participate actively, to explore actively, to think actively and to practice actively.

3.4.4. Hybrid Teaching Evaluation Method

A multi-dimensional evaluation system should be constructed, including multi-evaluation main body, multi-dimensional evaluation content and multi-evaluation results. The main body of evaluation is diversified, which includes teacher evaluation, student evaluation, peer evaluation and so on. The multi-dimensional evaluation includes four dimensions: knowledge, skill, process and attitude. The evaluation results are diversified and qualitative and quantitative methods were adopted.

4. Conclusion

In view of the problems existing in the practical teaching activities of the course of modern communication principles, this paper expounds the concrete design of the course teaching reform

from the aspects of the course ideology and politics, the teaching content, the online and offline mixed teaching mode and the task-driven. Through the exploration of innovative teaching methods, students become the real beneficiaries. On the basis of mastering the basic principles of communication system, students' comprehensive innovation ability and engineering practice ability are improved continuously.

Acknowledgement

This article is in the Teaching research project "JG21111" and "JG18097" of Xi'an University of Science and Technology.

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