The classroom teaching reform of "Computer Network" course of "three paragraphs and three levels, the combination of evaluation and questioning, and multiple assessment"

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Abstract. The computer network course is a compulsory course for computer majors, which is offered in the second semester of the second year of college. Students' understanding of the network is in the simple application level, and they lack the thinking and ability to analyze and solve network problems from a professional perspective. This paper focuses on the research and practice of the traditional classroom of computer network, takes "theme" as the center to reconstruct the teaching content, adopts the "three paragraphs and three levels" online and offline mixed teaching mode, and solves the problems that the knowledge points in the traditional teaching are low correlation and students cannot apply what they have learned. It has some practical reference value for teachers to broaden teaching ideas and choose teaching methods in classroom teaching in the future.

Keywords: Computer network, Classroom, Teaching reform.

1 Research status of computer network classroom teaching reform

1.1 Research background

Who to train, how to train, and for whom to train is the fundamental question of education." The Minister of Education, Comrade Chen Baosheng, proposed in the article "Running a Satisfactory education for the People" that "deepening the reform of education personnel training mode, setting off a" classroom revolution "and striving to cultivate students' innovative spirit and practical ability." Under the background of new engineering, the reform of higher education should be carried out according to the country's demand for professional personnel training, and it should advocate the application of knowledge and the combination of theory and practice. Change the traditional way of education, deepen the

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reform of classroom teaching in college education, innovate the mode of education and teaching, and constantly improve the quality and level of education.

At present, the education model has gradually formed a student-centered, ability-oriented and teacher-guided education concept, which requires the improvement of professional construction and the promotion of teaching reform. Teaching reform involves personnel training program, teaching syllabus, teaching content, teaching methods and methods, especially classroom teaching. In order to adapt to the new educational concept, teachers not only need to improve their teaching level and broaden their knowledge field, but also require students to make full use of the classroom to express themselves, so that students can consolidate their learning effect in questioning, exploration, communication and experience, and cultivate students' learning enthusiasm, initiative and innovative consciousness, so as to meet the needs of talents for the development of today's society.

1.2 Problems faced by the teaching of Computer Network

Computer Network is characterized by many knowledge points, strong rationality and abstract theory. The course is offered in the second semester of the second grade. Students' understanding of the network is simple and applied, and they lack the thinking and ability to analyze and solve network problems from a professional perspective.

In the past teaching, "Computer network" classroom teaching mainly has the following "pain points" problems:

The knowledge points of the course are numerous and complicated, the theories are abstract, and the traditional teaching mode is difficult to establish the correlation between knowledge, so teachers cannot teach and students cannot learn thoroughly.

The traditional classroom teaching mode pays too much attention to the study of theoretical knowledge and less attention to the achievement of ability goals, which is not closely combined with the actual enterprise network cases, and it is difficult to apply the knowledge.

Students are accustomed to passive learning, weak awareness of active exploration and cooperation, lack of effective regulation in the learning process, and the effect of continuous improvement is not ideal.

2 The research content of computer network classroom teaching reform

With the goal of achieving curriculum objectives and promoting students' all-round development, this project reconstructs teaching content with "theme" as the center, adopts the "three-stage, three-level" online and offline mixed teaching mode, establishes the "three questions and three evaluations" continuous improvement mechanism, forms a multiple evaluation system based on process evaluation, and finally forms an innovative classroom teaching mode represented by "Computer Network". Discussion learning is carried out in groups by means of group project exercises, speech debates, flipped classroom, after-school practical training, etc., which promotes the progressive achievement of the third-level goals of each member, significantly improves practical and innovative abilities, and helps teachers improve teaching quality.

2.1 Determine the curriculum goal based on ability achievement and reconstruct the teaching content centered on "theme"

According to the graduation requirements of applied information talents in new engineering, it is determined to identify and solve network communication problems; Scientific selection, development and evaluation of network solutions; Consciously abide by technical standards and laws and regulations in network engineering practice, with good professional quality and professional ethics; Gradually form a sense of lifelong learning and the idea of "software definition", and be able to explain the key technologies and application scenarios of IPV6, SDN and other cutting-edge technologies by referring to literature and other methods. According to the reality of enterprise network, the teaching content is reconstructed with "theme" as the center. A theme is a practical networking case.

2.2 Innovative blended teaching mode based on BOPPPS model

Based on the BOPPPS teaching model, the "three-stage, three-level" online and offline mixed teaching mode is adopted to optimize the course design, and the whole teaching process is divided into three periods before class, during class and after class. In order to confirm the achievement degree of students' learning effect, three-level goals are established, namely, first-level knowledge goal, second-level ability goal and third-level innovation goal. Before class, students learn basic knowledge, basic principles and basic technologies through online resources, so that students can reach the first-order knowledge goal of mastering basic concepts of network and functions of each layer, etc. During class, on the basis of pre-class knowledge learning, they can solve network problems in the learning "theme" and cultivate the application ability of knowledge, so that students can reach the second-order ability goal. After class, students can further improve their ability to achieve the third level by participating in the expansion project.

2.3 Refine the regulation of students' learning process and establish a continuous improvement mechanism

Establish the continuous improvement mechanism of "evaluation and inquiry combination" to achieve the iteration of learning effect. The question is to ask yourself, the theme question, the summary question, and the corresponding evaluation, that is, the self-evaluation, the theme evaluation and the summary evaluation. After self-study before class, after the end of a teaching topic, and after the end of the whole semester, the learning effect and teaching effect evaluation and questionnaire are carried out: self-evaluation combined with self-evaluation, theme question combined with theme evaluation, summary question combined with summary evaluation, and attention is paid to the growth and change of each student.

2.4 To benchmark the curriculum ability objectives and form a multiple evaluation system based on process assessment

According to the determined curriculum ability objectives, the teaching focuses on the growth of students, adopts a goal-oriented and strengthened process assessment system, process assessment mainly includes homework, experiment reports, online assessment and learning reports, mainly examines students' network planning, design, implementation and protocol analysis abilities, and the final assessment mainly focuses on ability assessment. This paper mainly examines students' ability to use network knowledge to explain network phenomena and solve network problems, comprehensive ability of protocol analysis,

evaluation of network performance and other advanced abilities. To promote changes in teaching and learning methods through improvements in evaluation methods.

3 Computer network course classroom teaching reform plan design

According to the requirements of applied information talents in new engineering, the curriculum objectives are determined to achieve the ability to solve network problems, formulate and evaluate network schemes. According to the reality of the enterprise network, the teaching content is reconstructed for the "theme" as the center. Innovation of "three levels and three stages" online and offline mixed teaching mode, optimize teaching design. In order to strengthen the process supervision, the "three questions and three comments" continuous improvement mechanism has been established. According to the curriculum ability goal, the formation of strengthening process assessment of multiple evaluation system, to cultivate high-quality and strong skills network application talents.A solution to the problem.

3.1 Determine the curriculum objectives based on ability to achieve, and design "theme" teaching projects based on enterprise application scenarios

According to the requirements of talent training, the curriculum goal based on "ability to achieve" is determined. According to the development needs of the new generation of information technology industry, the teaching content of Computer Network is divided into 24 topics such as HTTP protocol analysis and DNS domain name resolution. The decentralized knowledge is modularized with "theme" as the center, and a theme is an actual network case.

3.2 Based on the BOPPPS model, innovate the "three-level, three-stage" online and offline mixed teaching mode

Based on the BOPPPS teaching model, the "three-stage, three-level" online and offline mixed teaching model is innovated (as shown in Figure 3). The teaching process is divided into three periods of eight steps before class, during class and after class. Before class, students are provided with learning resources according to the teaching theme, online self-learning, and self-assessment, so as to form basic computer network knowledge, principles and technologies such as preliminary IP planning scheme according to the project needs, and achieve the first-order knowledge goal. In the class, the teacher gives targeted lectures, and the students choose the subnetwork technology according to the project needs through participatory activities, so as to cultivate the students' ability to use knowledge to solve problems, that is, to reach the second-order ability goal. After class open laboratory team practical expansion project, can achieve the third level of innovation goal. Teaching implementation gradually improved from easy to difficult.

3.3 Strengthen the process control and timely tracking of efficiency, and establish a continuous improvement mechanism of "evaluation and query combination"

Establish a continuous improvement mechanism of "combination of evaluation and inquiry", pay attention to students' growth, strengthen process regulation and timely tracking and inquiry. The evaluation and questionnaire of learning effect and teaching

effect were carried out after self-study before class, after the end of a teaching topic, and after the end of the whole semester: self-evaluation - self-questioning, theme evaluation - theme question, summary evaluation - summary question. According to the results of the "combination of evaluation and questioning", the problems are found and timely measures are taken to help, and the teaching in the later period is continuously improved to achieve the purpose of improving quality and efficiency.

3.4 According to the curriculum ability objectives, the formation of a multi-component assessment system to strengthen the process assessment

In teaching, we pay attention to the growth of students, adopt target-oriented and process-based assessment of multiple evaluation methods, and all evaluation has "evidence" to rely on. Through the change of evaluation method, the transformation of teaching method and learning method is promoted, so that teachers and students pay more attention to the achievement of advanced ability and quality cultivation.

4 The expected effect of computer network course classroom teaching reform

"Computer Network" teaching determines the ability to achieve the main goal of the course, the establishment of target-oriented, strengthen the process of multiple evaluation system, with the change of evaluation mode to promote the change of teaching and learning. Based on the problems of teaching status, teaching objects and teaching objectives in the physical classroom of Chinese colleges and universities, the continuous improvement mechanism of "evaluation and questioning" is constructed, and the theoretical system of teaching reform in colleges and universities is enriched through practical research. In teaching, information technologies such as Learning Pass and Tencent collection form are used to carry out intelligent teaching, fully mobilize students' enthusiasm to participate in learning, improve teaching efficiency, and shorten the distance between teachers and students. At the same time, a large number of learning records are retained, providing a strong basis for teaching analysis and evaluation. At the same time, the rich online and offline development materials, the introduction of cutting-edge technologies in the curriculum, and the careful design of after-school development tasks enable students to go out of the teaching materials and classrooms to see more distant landscapes, and some students can achieve innovative results on this basis.

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