

Research on the Teaching Reform of Network Application Development under the Background of First-class Specialty

Meina Zhang^{1, a}, Ji Zhao¹

¹School of Computer Science and Software Engineering, University of Science and Technology Liaoning, Anshan 114001, China

^azhangmeina@163.com

Abstract: With the goal of cultivating application-oriented and innovative talents, based on the teaching philosophy of "student-centered, output-oriented, continuous improvement", combined with modern information technology, and based on online and offline mixed teaching has become an inevitable trend of curriculum construction universities. This paper discusses the teaching reform research situation of "Network Application Development" course under the background of first-class specialty, mixed teaching design, course teaching content and organization, course assessment and course evaluation, comprehensively exploring the new ideas of curriculum reform, and cultivating new engineering innovative talents.

Keywords: Network Application Development, Mixed teaching design, Student-centered.

1. Introduction

The network engineering major of Liaoning University of Science and Technology was approved as a pilot major of provincial innovation and entrepreneurship reform, and changed to an application-oriented demonstration major in 2017; selected as the provincial first-class undergraduate education demonstration major in 2019; in March 2021, it was approved as a national-level first-class undergraduate professional construction site; at present, is actively applying for professional engineering certification. The course "Network Application Development" is the core course of network engineering specialty and the first-class undergraduate course of the university. under this background, the course is required to conform to the modern teaching concept of "student-centered, output-oriented and continuous improvement". How to design the teaching link of the course, combine the theoretical knowledge with the actual project development effectively, achieve the ideal learning effect, and fit with the modern teaching concept, is the significance of the teaching reform research of this course.

2. Basic Information of The Course

This course is a compulsory course for students majoring in network engineering, which is offered in the sixth semester. Students have already studied C++, Database Principles and other prerequisite courses, and have certain programming ability and problem solving ability. The main content of this course learning PHP development language, PHP language is the most popular development language of the Internet today, learning PHP is the first step of Web development. Through the study of this course, students can master the knowledge of PHP Foundation, PHP advanced programming, PHP interactive web pages, PHP operating database and so on, which lays the foundation for developing Internet dynamic website. Through the study of this course, students can have the ability to develop small and medium-sized websites. After graduation, they can directly engage in the design, development and maintenance of dynamic websites, which

enhances the employment competitiveness of network engineering students. It is in line with the goal of cultivating applied and innovative talents of the country and Liaoning Province, and more in line with the talent training needs of the provincial first-class undergraduate education demonstration major and the national first-class undergraduate major construction site.

3. Key Problems to Be Solved in Curriculum and Teaching Reform

(1) Improve students' autonomous learning ability. Adopting online and offline mixed teaching mode can better focus on students in learning, so that students' autonomous learning ability has been effectively exercised and improved.

(2) Training students' practical ability. The course is driven by project practice, and the whole teaching process runs through project simulation exercises, which are completed by students in groups. Students experience the complete development process of the project, help students accumulate project practice experience, exercise students' comprehensive ability, improve students' comprehensive quality, and strengthen students' comprehensive practical ability and teamwork ability.

(3) It is beneficial to teach students in accordance with their aptitude. With the help of online resources, students preview and review according to their own abilities, habits and mastery, and adjust the learning progress, time and speed, thus realizing the students' master status.

4. Course Construction

4.1. Mixed teaching design:

1. Before the class starts, provide students with a brief video and PPT of this course, including the general situation of this course, main learning contents, learning objectives and how to learn.

2. The teaching organization in mixed teaching is based on BOPPPS teaching structure. On this basis, the course leader should apply it flexibly according to the course system.

(1) Bridge-in

Review the content of last class: Methods: comment on homework, test or learn to answer questions by selecting people on chaoxing. The purpose is to check students' understanding and mastery of the knowledge learned last class.

(2) Learning Objective

Publish the task list of this class, including learning objectives, learning priorities, difficulties, teaching process and preparation for this class.

(3) Pre-assessment

Through the pre-test, students' mastery of online video learning before class can be examined, and at the same time, students' interests and abilities can be understood, and students' prior knowledge can be understood.

(4) Participatory Learning

Explain the learning content of this class, ask random questions at the same time, and ask students to demonstrate the programming realization in class. Finally, answer the students' pre-class learning questions, so that students' understanding of knowledge can be improved.

(5) Post-assessment

According to the content of this lesson, there will be a test session in class. The test questions are divided into two types, multiple-choice questions and programming questions. Through post-test, we can know what students have learned and whether they have achieved their learning objectives.

(6) Summary

Summary: Summarize the learning content of this class, emphasize the key and difficult points, help students integrate, preview the next course content, and arrange the preview content after class. Assign homework: routine homework, mainly based on the learning content of this class, and the results are reviewed and given by the system and teachers; Experimental assignments: Students' experimental

reports and experimental program files are taken as experimental assignments, and the scores are reviewed and given by teachers.

4.2. Course Content and Organization

The course content is divided into eight chapters, and the online and offline teaching hours, teaching contents and corresponding online activities are reasonably arranged according to the different contents of each chapter. (The following offline hours refer to theoretical hours, excluding experimental hours)

The first chapter is an overview of PHP language. There are 1 class hour in online class and 4 class hours in offline class. Learn through online video before class, check courseware, explain knowledge points by offline teachers, and complete online homework after class. The second chapter is the basic knowledge of HTML. There are 2 class hours in online class and 8 class hours in offline class. Chapter 3 PHP Basic Syntax. There are 2 hours in online class and 4 class hours in offline class. Chapter 4 PHP functions. There are 1 class hour in online class and 4 class hours in offline class. The fifth chapter is PHP data processing. There are 3 hours in online class and 4 class hours in offline class. The sixth chapter is PHP object-oriented programming. There are 1 class hour in online class and 8 class hours in offline class. Chapter 7 PHP Interactive Web Pages. There are 1 class hour in online class and 4 class hours in offline class. Chapter 8 PHP manipulates the database. There are 2 hours in online class and 4 class hours in offline class.

Before class, learn through online video, check courseware, explain knowledge points by offline teachers, publish tests and classroom activities, and complete online homework after class.

The basic data of the course is shown in Figure 1.



Figure 1. The basic data of the course

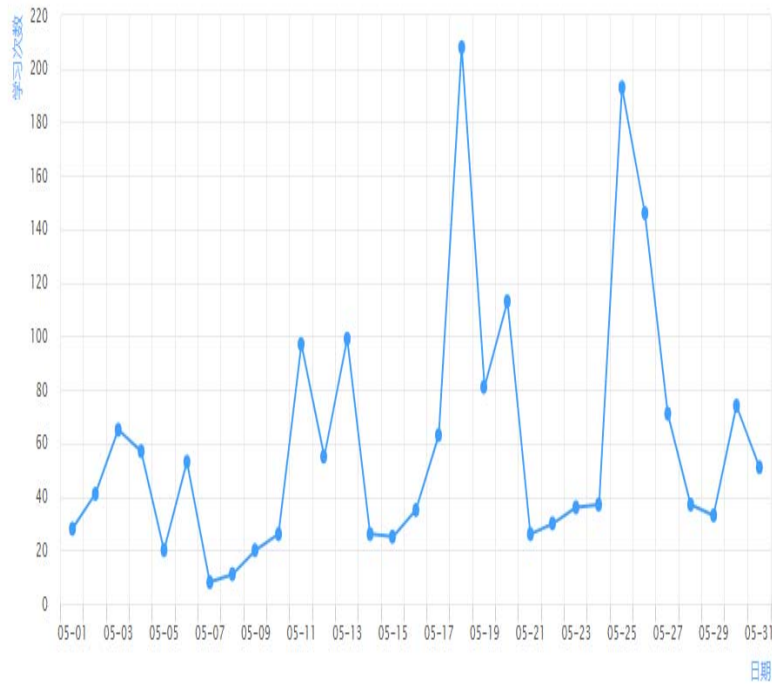


Figure 2. Number of student visits in May 2022

Taking the network class 2019-34 in the latest semester as an example, the number of students visits in May 2022 from

chaoxing platform is shown in Figure 2. The distribution of students' course points is shown in Figure 3.

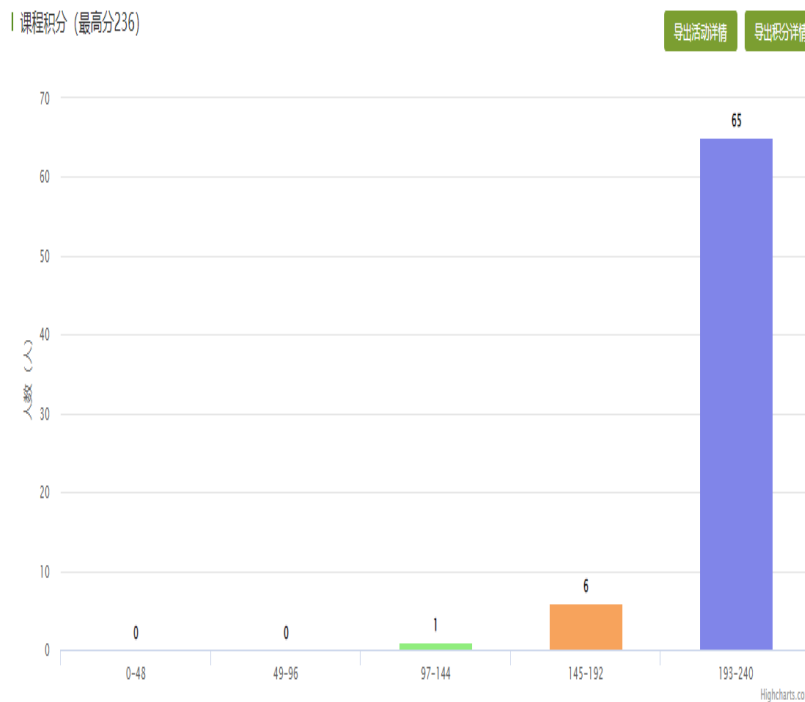


Figure 3. Students' course points

4.3. Course achievement evaluation method

Usual grades: Determine grades according to online and offline activities and homework completion.

Experimental results: According to each experimental assignment, the teacher determines the results according to the evaluation criteria of this kind of experimental items.

Final exam: The teacher reviews the students' answers according to the evaluation criteria of test paper answers and determines the scores.

5. Course Evaluation and Reform Effectiveness

There are 143 students of Grade 2019 in network engineering, with The final exam average score was 82. The cumulative online page views have reached 134,740 times, and the completion rate of task points has basically reached 100%. From the feedback of students' questionnaires, it is quite satisfactory and achieves the expected reform effect. Through the curriculum reform, students'

comprehensive ability to develop projects has been improved, and they are handy in graduation design. Students are more actively involved in national, provincial and school-level creative projects and various competitions, and the achievements of project establishment and award-winning have been improved year by year.

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