Exploration and Practice of Teaching Reform of Operating System Course

Yan Li* and Chun JIAO
College of Intelligent Science and Information Engineering, Xi'an Peihua University, Xi'an, China
‘79132181@qq.com

Keywords: Operating system; Linux; Teaching reform.

Abstract. By analyzing the characteristics of operating system course, this paper expounds the idea of curriculum reform with Linux as the basic operating system under the new form, expounds the basic conception of curriculum reform, designs the experimental contents of the course, and emphasizes on strengthening the training of students' practical and innovative abilities.

Introduction

Operating system course is an important course of computer specialty. Its value is not only reflected in the nature of the course, but also in helping us understand and study the characteristics of computer components, algorithm design, program implementation and working principle. Basic and necessary knowledge. With the emergence of the Internet, many advantages such as the openness of Linux operating system make its share in the Web server market continue to grow. At the same time, Linux is also an attractive choice for embedded operating system. As a result, Linux, an open source software, has become increasingly popular and has become the first choice for college students to study and research computer basic support software. This also puts forward higher requirements for the teaching of this course. We should not only pay attention to theoretical study, but also make it withered. The theoretical explanation of dryness should be simplified, and students' practical ability should be paid more attention to, so as to combine theory with practice. How to improve the teaching of operating system is the common goal of teachers engaged in operating system teaching. Therefore, we should continue to explore more perfect ones. Teaching mode and necessary teaching reform should be carried out to achieve good teaching effect.

Teaching Ideas and Course Training Objectives

Teaching is the general term of interaction between teachers and students, guided by a certain goal and mediated by teaching content. It is the communication between teachers and students based on dialogue, communication and cooperation to carry out cultural knowledge inheritance and innovation.

Go to activities. The mechanism of teaching activities is: teachers -> teaching contents -> students. Teaching activities are mainly carried out through teaching and learning teaching contents. The teaching of operating system course should change from simply imparting knowledge to imparting knowledge, at the same time, pay attention to cultivating students' quality and ability. Around the idea of running a school aiming at knowledge, ability and quality, it is the orientation and goal of operating system course in professional training.

Implementation of Teaching Reform

Course Contents

The course of operating system mainly introduces the basic concepts, principles and methods of Linux operating system. OS is at the bottom of computer system software, abstract and difficult to understand. It is also deeply realized in teaching practice if it is in classroom teaching. When
explaining the principle of operating system, students will feel dull and difficult to understand. Only by combining teaching with practice and paying equal attention to both theory and practice can we achieve better teaching results. The so-called combination of theory and practice refers to the study of theoretical knowledge. At the same time, arrange relevant practice links to deepen the understanding of theory through practice. Therefore, around the important contents and methods of operating system course, we design experiments based on Linux operating system. Through these experiments, we can stimulate students' interest and initiative in learning, and cultivate students' ability to analyze and solve problems.

The experiment contents are as follows:

1. Familiar with Linux commands. Through the execution of some basic commands under the Linux system terminal, a preliminary understanding of the Linux system is established.
2. Using VI compiler to create, edit, display and process text pieces.
3. Shell programming. Learn to write simple shell scripts.
4. System call (file management). Linux system calls are divided into six functional categories: device management system calls, file system operation system calls, process control system calls, storage management system calls, communication system calls.

System calls for use and management. According to the class hours, two classical windows experiments can be added.

1. Process management. Write the Java language to realize the philosopher's dining problem.
2. Deadlock avoidance. Write banker algorithm to avoid deadlock.

Textbook Construction

A good textbook should not only focus on the classical principle of Linux, but also closely link with the current popular design technology and the development direction of the operating system, and combine the basic principle with the operating system example. Combining with our students actively follow up the excellent operating system textbooks at home and abroad, and compile textbooks with key teachers of operating system courses in brother colleges.

Teaching Method

As a teacher, the three-foot platform is our stage. How to attract students to this stage, arouse students' interest in learning, and cultivate students' ability to analyze and solve problems is an important topic for our teachers. To overcome this problem, we should first fully understand the situation of students and their ideas. There are differences in the level of students, but our basic teaching aims are the same. First of all, we should perfect the classroom system, which includes classroom summary, classroom purpose, teaching content, teaching methods, time allocation and so on. Among them, classroom review is very important. First of all, students should be given a complete knowledge structure, the focus and difficulty of the content, the purpose of learning, especially the best way to point out the practical problems that this section of knowledge can solve, which can help students to better complete classroom learning. At the same time, students can study purposefully on the basis of the complete classroom knowledge system, and test their learning effect according to the expected purpose and practical problems. Secondly, the applicable teaching methods can also achieve certain results.

1. Discussion Formula

Nowadays, there are many courses for students. They seldom preview and consult relevant materials before class. They follow the teacher's thinking in class, and seldom ask questions. In order to improve students' initiative and enthusiasm in learning, we let students actively participate in the teaching process. In some chapters, discussion classes are offered, and discussion sub-groups are arranged by teachers. Teams are required to search for information on the topic, prepare discussion outlines, design relevant algorithms, and take some time out in class for discussion. Finally, teachers summarize the topics. For example, when we talk about Linux file system, we arrange this topic in advance and discuss it in class. Students will actively prepare to consult the materials after class, take the initiative to acquire knowledge, and take the knowledge they have learned as an example in the discussion process. In this way, the relatively dull knowledge becomes easy to understand with the
active participation of everyone. Discussions are a good teaching method. In this process, reasonable topic selection, orderly organization and discussion of their speeches are taken as the record of the usual achievements.

Usual performance evaluation mechanism has been established. We have four major parts to assess, including class arrival rate, students’ interaction, students’ experimental results, and homework. To a certain extent, it eliminates the phenomenon of holding Buddha's feet before and throwing them away after the exam. Assessment means and the whole learning process are closely integrated, so that students' learning ability can be comprehensively examined and passive learning can be turned into active learning.

(2) Project-driven teaching practice

Experiments are an important part of operating system teaching. The setting of experimental courses should follow the principles from easy to difficult and from simplicity to complexity, construct students-oriented, scientific thinking and exploration, stimulate students' initiative and enthusiasm in learning, and cultivate students' analysis and questioning.

An experimental system that emphasizes both problem solving and innovation ability. Do a good job of project topic selection design, this paper designs experimental projects under different platforms. Before the experiment, teachers guide the experimental ideas and principles, architecture, algorithm design and key technologies. During the experiment, the students were divided into groups, with three students in each group. After the experiment, the students submitted the experiment report according to the group and recorded in their usual scores.

(3) Establishing network teaching platform

Establish a strong team of teachers, apply for quality courses, by the course group teachers will courseware, experiments, problem sets, reference materials uploaded to the Internet, convenient for students to consult after class. The electronic discussion module can be set up for discussion and message.

Conclusion

The reform of operating system course is mainly carried out from the aspects of teaching content, how to improve students' initiative and enthusiasm in learning. Through a series of teaching reform measures, the dull and abstract theoretical knowledge becomes easy to understand and vivid. It improves students' enthusiasm and initiative in learning, enhances their ability to analyze and solve problems, and also enhances their practical and innovative abilities.

Acknowledgement

This research was financially supported by the Special Scientific Research Project of Shaanxi Education Department in 2018 (Project number: 18JK1085)

References