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Research on the Teaching Reform of Linux Operating System Course under the Mixed Teaching Mode of Online and Offline

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Abstract: This paper studies the significance and strategy of Linux operating system course teaching reform under the mixed teaching mode of online and offline, aiming to provide relevant experience for professional course teachers, so that front-line teachers can better teach Linux course teaching, and students can better learn with purpose. Through the exploration and research of the curriculum teaching reform, students are encouraged to have an interest in learning Linux courses, give full play to the advantages of the teaching design combining online and offline, and enable students to master the technology and integrate certain ideological and political teaching content, so that students can have good professional ethics and better contribute to the development of the country.

Keywords: Online and offline mixed teaching mode; Linux operating system; Curriculum teaching reform

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1. Introduction

The Linux operating system, with its open source, stability and security characteristics, can be applied in the world. The state also attaches special importance to the information work, therefore, the Ministry of Education issued a letter on the fourth meeting of the 13th National Committee of the CPPCC No. 4271 (Education category No. 437) proposal reply, clearly pointed out that it is necessary to improve the integration mechanism of online and offline education, promote education and teaching reform, improve the quality of education [1]. The development of colleges and universities should be in line with the trend of national development, to go further. This article through some strategies to reduce the difficulty of learning, stimulate students' interest in learning, and improve students' ability of independently learning.

2. The problems of traditional teaching methods

2.1. The low enthusiasm of students in learning

Traditional teaching methods often adopt the way that teachers teach and students passively accept, resulting in a lack of initiative and enthusiasm of students in the learning process. The Linux operating system course itself commands a variety of complex operations, students in their first contact often find it difficult to adapt, especially compared with the Windows operating system. Linux command line operation mode is unfamiliar and confusing to students [2]. In this case, students are prone to fear difficulties and even conflict with the course, thus affecting the learning process. In addition, the experimental teaching under the traditional teaching mode is often set up to verify the theory, and students lack the guidance and drive of practical problems in the experiment process, making it is difficult to convert theoretical knowledge into practical operational ability, and further reducing the enthusiasm of students.

2.2. Disconnection between theory and practice

In the course of the Linux operating system, theory teaching and practice teaching are usually carried out separately; the teacher teaches the theoretical knowledge in the classroom, and then the students carry out the experiment operation in the computer room. However, this kind of teaching method often leads to the disconnection between theory and practice. It is difficult for students to deeply understand the practical application scenarios of knowledge in theoretical learning, and the lack of sufficient theoretical guidance in experimental operation greatly reduces the learning effect greatly reduced. Due to the limitations of experimental conditions, students can only get access to the Linux operating system within the experimental time stipulated in the course, and a lack of enough practical opportunities, resulting in the effective improvement of students' practical ability.

2.3. Teaching resources and environmental restrictions

On the one hand, the teaching resources under the traditional teaching method are relatively scarce, and it is difficult for students to obtain rich learning materials and cases, which makes it difficult to solve problems in the learning process. On the other hand, due to the limitation of experimental conditions, students often can only carry out experimental operations in a specific time and place, which lacks of flexibility and convenience.

3. The significance of exploring the teaching reform of the Linux operating system course under the mixed teaching mode of online and offline

3.1. Reduce the difficulty of learning and improve the teaching effect

As the second level of the three-level teaching of the computer major, the importance of the Linux operating system course is self-evident. However, because the knowledge points of this course are many and abstract, students often feel confused and confused in the learning process. Traditional teaching methods tend to pay attention to the teaching of theoretical knowledge, but ignore the importance of practical operation, which makes it difficult for students to apply what they have learned to practice [4]. The introduction of the online and offline mixed teaching mode reconstructs complex knowledge points utilizing online preview and offline practice, takes tasks as the driving force, enables students to master relevant knowledge in practice, uses virtual simulation technology to simulate the actual working environment, reduces the difficulty of building experimental environment, and enables students to complete the operation of actual cases on their computers. Greatly improve the teaching effect.

3.2. Stimulate students' interest in learning, skillfully integrate ideological and political elements, and improve independent learning ability

Online and offline hybrid teaching mode pushes teaching videos, tasks, and other learning resources through online platforms to stimulate students' learning interest and curiosity. Students can choose the corresponding learning content according to their own learning progress and interest, and carry out independent learning and exploration. At the same time, teachers should design reasonable ideological and political teaching content matching with professional content according to the teaching process of each module, and naturally integrate it into the professional teaching of the Linux operating system. Offline classroom teaching adopts a heuristic explanation and a subtask-driven model to guide students to actively think and solve problems, and cultivate students' independent learning ability and innovative thinking.

4. The teaching reform strategy of the Linux operating system course under the mixed teaching mode of online and offline

4.1. Personalized exploration of the Linux file system to promote comprehensive development

Teachers can combine online and offline mixed-mode teaching in systematic teaching [6]. Online, teachers can fully consider the differences and diversity of students, and design a task about Linux file system, requiring students to explore the structure and function of Linux file system through practical operation, while recording their findings and problems [7]. It can also release some exercises for students to answer, which also has a feedback mechanism. Teachers can check the students' learning progress and answer questions, can record the problems and puzzles in the process of students. Offline, teachers can organically integrate students' questions with the teaching content of the course. In this way, teachers can understand students' learning habits and problems, and carry out targeted teaching content reform on this basis, so that students can fully understand and master the knowledge points related to Linux operating system, stimulate students' learning interest, understand the structure and function of Linux file system, help students consolidate theoretical knowledge, and improve practical operation ability. Stimulate students' learning interest and enthusiasm, and promote their all-round development.

4.2. Integrated teaching method combined with virtual simulation technology to deepen the cognitive ability of the operating system

In the traditional teaching mode, file system management, process management, storage management, equipment management and other contents are divided into independent chapters for teaching, which makes it difficult for students to form a comprehensive and systematic cognition of the Linux operating system [9]. Therefore, teachers can use a virtual machine, VMware Workstation to simulate the actual working environment, design a thorough task, link each part of the content, and form a complete knowledge system. For example, when a network communication shell program is input from a student, the local operating system needs to provide a user interface to accept the system, and then the program needs to be stored on a disk in a specific format. When the program needs to run, the operating system needs to import it from the disk to the memory and allocate the necessary resources to it. Then it communicates with other operating system processes on the VM and invokes their related resources, which involves process management and network device management [10]. Finally, the result of the program running will be displayed on the display device. In the teaching of Linux course, it can also adopt the teaching form of integration of theory and practice, and rely on the concept of OBE achievement

transformation, based on the innovation of Boppps teaching mode. In the course, teachers first stimulate students' learning interest through the introduction stage of Boppps teaching mode. Then, in the target stage, the teacher defines the learning results, so that students know the skills they need to master, and then through the pre-test to understand the basis of students, and then in the participatory learning stage, combined with the actual operation of the Linux system, so that students can deepen the theoretical knowledge in practice. In the post-test phase, students are tested to ensure that they have achieved the expected learning outcomes. In short, students are helped to consolidate what they have learned and reflect on the learning process.

4.3. Online questionnaires help the Linux operating system teaching and optimize teaching strategies

In the teaching of computer courses, especially in the complex and practical field of the Linux operating system, students' learning progress and difficulties often vary according to individual differences and environmental conditions [12]. Among them, a significant problem is that some students may lack the necessary computer equipment or network conditions, and cannot fully participate in the application of the operating system, which will undoubtedly harm their learning effect. In order to effectively deal with this problem, teachers need to adopt more flexible and targeted teaching strategies, among which, using an online questionnaire to communicate is an effective means. Teachers can set up detailed online questionnaires according to students' understanding of what they learned in the last class, the review after class, the difficulties and challenges they encountered, and the suggestions and expectations for the next class, to collect students' learning feedback. In the classroom, this form can also be used. For example, the teacher can design the following questions: "Please briefly describe the basic principles of the process management of the Linux operating system that we learned last class" [13]. "When reviewing after class, what did you encounter that was difficult to understand or remember?" To understand which knowledge points are generally well mastered by students and which need to be further explained and emphasized, and to find out which students are facing difficulties due to the lack of computer equipment or Internet conditions, so as to provide personalized help and support. For students who do not have access to computer equipment, teachers can suggest that they use the school's public computer room to practice, or recommend some resources and platforms suitable for online learning. For students with limited Internet access, teachers can provide offline learning materials so that students can reduce their Internet dependence. By communicating with students in the form of online questionnaires, teachers can fully grasp the learning dynamics and difficulties encountered by students and then adopt more accurate and effective teaching strategies.

4.4. Linux operating system teaching reform, multi-dimensional optimization and innovative practice

The teaching reform of the Linux operating system course is a multi-dimensional and deep exploration process, which requires teachers to optimize and innovate in various aspects of teaching content, teaching methods and teaching evaluation. First, for the online teaching content, teachers can help students build a solid theoretical framework through video and interactive Q&A. Online forums can be used for students to ask questions and share their experiences. In the offline part, I completed the installation, configuration, management and Shell script programming of the Linux system through group cooperation [14]. Second, in terms of teaching methods, teachers can combine the project-driven method based on online and offline to design tasks related to the application of the Linux operating system, so that students can receive new knowledge in solving problems. It can also combine the case analysis method, choose a specific case, let the students to analyze, each module to

apply the knowledge, to test the overall ability of students. Third, from the perspective of the evaluation system, since Linux is a highly practical subject, we should not only pay attention to students' final exam scores, but also pay attention to students' mastery of the system in the classroom. We should leave a practical homework at the end of the semester to see how students complete and master the system. Fourth, the ability of teachers is the key step in the implementation of these aspects, so colleges and universities should have a complete set of processes to improve the skills of teachers, ensure that they can use online and offline resources, design high-quality teaching programs, and provide students with better teaching services. All these are a systematic project.

5. Conclusion

"Talent training must be the process of educating people and educating talents, and educating people is this." Therefore, in the process of implanting knowledge, teachers should pay attention to students' professional ethics and political tendencies to strengthen the "moral cultivation," pay attention to the overall improvement of students' comprehensive quality, deepen curriculum reform, and strive to make contributions to the development of educating people and better the country.

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Disclosure statement

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