International Journal of Education and Humanities
ISSN: 2770-6702 | Vol. 4, No. 2, 2022

Design and Practice of Linux Curriculum Reform Based on PBL And Its Ideological and Political Teaching

Dongmei Luo

School of Computer Science, Guangdong University of Science and Technology, Dongguan, Guangdong, China

Abstract: In order to solve the problems of the low teaching quality of Linux operating system courses, the disconnection between the teaching content and the needs of enterprises, and the difficulty in effectively integrating the ideological and political content, this paper takes the course "Linux Principles and Applications" as the research object, reflects on the current teaching status and refers to the teaching objectives, and proposes Taking the PBL teaching method as the core, highlighting the project orientation, moisturizing things silently into the ideological and political education, and a student-oriented teaching model. Divide project tasks according to course knowledge points, run them through the entire learning process, build a teaching system that integrates course projects with ideology and politics, and effectively cultivate students' practical ability, innovation ability, professional quality and positive and optimistic psychological quality. Selecting the 15 experimental class and 16 control class of software engineering major in a private application-oriented university to form a comparison, and using SPSS 22 software to analyze the pre- and post-test scores of the experimental class and the control class, the results show that the curriculum based on the PBL teaching method is adopted. The learning effect of students in the ideological and political teaching mode has been significantly improved.

Keywords: PBL teaching method, Course ideology and politics, Linux operating system.

1. Introduction

In 2021, the Central Committee of the Communist Party of China issued the "Rules of the Communist Party of China on the Work of Grassroots Organizations in Ordinary Colleges and Universities". The document clearly states that colleges and universities should give full play to the role of the main channel of classroom teaching, promote the ideological and political construction of courses, and for the first time incorporate the ideological and political construction of courses into the basic rules of college work[1]. Promoting the construction of "course ideology and politics" of professional courses has become an important task for college teachers to carry out teaching reform and improve teaching quality.

"Linux Principles and Applications" is a core compulsory course and an important professional characteristic course for computer majors. As a multi-user, multi-tasking network operating system, Linux has the advantages of openness, stability, security and low cost. Wide range of applications[2]. Therefore, learning to use the Linux operating system is an essential skill for students of computer and other related majors.

Today, with the rapid development of information technology, new technologies emerge in an endless stream, industry competition intensifies, and the quality of talents is getting higher and higher. The traditional teaching method of Linux courses exposes problems such as the inability to keep pace with market development and the difficulty of integrating ideological and political education[3]. This paper proposes the teaching mode of Linux operating system course ideology and politics based on PBL concept to explore.

2. Current Situation of Teaching and Research of "Linux Principles and Applications"

The teaching of Linux operating system course stays in the traditional mode of "teaching by teachers and learning by students". First, the teaching method is single, the teaching process is mainly based on classroom theory lectures, supplemented by experimental operations, there is less interaction between teachers and students, and students' participation is poor. Students can only complete the designed verification projects according to the established steps. There is a lack of comprehensive and innovative experiments. The experimental results can only see the experimental phenomenon, and it is difficult to improve the students' practical ability, design ability and innovation ability. Third, because the teaching of curriculum skills is more loyal to textbooks and lacks the connection with the actual needs of enterprises, there is a big disconnect between the knowledge learned and the needs of enterprises.

The Linux operating system course attaches great importance to knowledge imparting and ability training, ignoring the value shaping of students, and failing to fully integrate ideological and political elements into the daily teaching process, which is contrary to the "education-oriented" nature of higher education. For example, on the evening of February 23, 2020, Weimob employee He Mou, after drinking for personal reasons, connected to the company's VPN through a computer at his residence, logged in to the company's server, and then performed the deletion task, deleting all the data in the Weimeng server. The merchant's system was paralyzed, and more than 3 million users could not use the company's SaaS products normally. It took 8 days and 14 hours to restore operations. The incident of Weimob employees deleting the library and running away made people realize the importance of integrating ideological

and political education into Linux courses.

In recent years, more and more educators have begun to pay attention to the PBL teaching model, and have applied it to the teaching process of many different courses, with good results. However, in the process of designing and implementing the PBL teaching model, the existing research seldom considers how to integrate specific ideological and political elements into each stage of PBL teaching. Especially for the course "Linux Principles and Applications", there are few studies at present to design an effective PBL teaching mode that integrates ideology and politics according to the characteristics of this course.

3. Course Ideological and Political Teaching Design and Practice Based on PBL Teaching Method

3.1. The Ideological and Political PBL Teaching Design of The Course "Linux Principles and Applications"

According to the course design of "Linux Principles and Applications", combined with actual and specific teaching, guided by the project, a rich online learning resource library of courses will be built. Upload course introductions, video resource links, teaching courseware, tool software, syllabus, lesson plans, project experiment guides, teaching plans, after-school exercises, mock exam question bank, in-class training guides, and weekly training guides on the Superstar platform. On the platform, pre-class preview notices are released, and activities such as check-in, selection, quick answer, topic discussion, in-class practice, group project tasks, pre- and post-test closed-book test and other activities are carried out, and online teaching resources are carefully constructed to provide students with learning directions. In the "Linux Principles and Application" course, there are a total of 25 projects. By comprehensively sorting out the integration points of the ideological and political elements of the course, reconstructing the professional teaching content, and transforming the ideological and political elements of the course into concrete and vivid " Project + Ideological and Political" case. Among them, the "vi editor" project is carefully designed as an example. The teaching process of the "vi editor" project is shown in Table 1 below:

Table 1. Teaching process of the "vi editor" project

Link	Teacher	Student
Before class	(1)Publish "vi editor" teaching video (2)Post the corresponding test questions	(1)Watch the "vi editor" instructional video (2)complete test questions (3)Baidu search data preview
In class	(1)Publish project experiment guide (2)Instruct and supervise students to complete projects (3)Provide targeted explanations on key and difficult points based on student feedback	(1)Students conduct research in groups (2)Group communication and discussion to complete the project experiment and present the results (3)Communicate and share practice results between groups
After class	(1)Reflect on teaching and improve teaching design (2)Advanced exercise for publishing a "vi editor" project in Learning Pass	(1)Teaching resources should be watched repeatedly and digested in time (2)Complete the advanced exercises of the "vi editor"project, multi-operation, multi-practice

3.2. The Ideological and Political PBL Teaching Practice of The Course "Linux Principles and Applications"

After completing the design of the course ideological and political teaching based on the PBL teaching method, we will use practice to verify whether it can stimulate students' interest in learning and improve the teaching effect. The 15th and 16th classes of the 19th grade software engineering major in a private application-oriented university were selected as the teaching objects, of which 15 classes were experimental classes, which adopted the ideological and political teaching mode based on the PBL teaching method, and the 16th class was used as the control class. The traditional teaching method is used to carry out teaching, and a semester-long teaching activity is carried out.

Linux is a highly practical course. Students should not only have independent programming and practical operation ability, but also have certain innovation ability and the idea of lifelong learning. This course is very suitable for PBL teaching method. In the teaching process, teachers design the project problem situation according to the teaching content and objectives, and students conduct in-depth analysis, exploration and practice of the project according to the teacher's supervision and guidance, and demonstrate, Summarize and evaluate the project results achieved, so as to realize the deep integration and transfer of knowledge[4]. At the same time, in the teaching process, integrating ideological and political elements through scientific teaching methods can further improve the depth and connotation of the curriculum and enhance students' professional confidence. There are rich ideological and political elements in the history of the development of Linux operating system, which embodies countless scientific spirits[5]. While imparting professional knowledge, teachers combine ideological and political elements to give lively and interesting explanations, which can make the course achieve better moral education effect[6]. Take the ideological and political elements contained in the "File Operation Command" project as an example, such as the rm -rf Weimob deletion event: with He's few lines of code, the market value of Weimob Group, a Hong Kong main board-listed company, is directly Over 1 billion yuan was evaporated in one day, and millions of users were directly affected[7]. This case serves as an entry point to

remind students that the national laws and regulations are very perfect now, and they must abide by the laws and regulations, and must not act impulsively, and usually do Good stress relief, emotional regulation.

4. Analysis of the Effect Of Course Ideological and Political Teaching Based on PBL Teaching Method

In this study, the pre- and post-test scores of the experimental class and the control class were counted respectively, and SPSS 22 software was used to analyze the data of the pre- and post-test scores of the experimental class and the control class.

On the one hand, an independent sample test was carried out on the pre-test of the experimental class and the pre-test of the control class, in order to test that the levels of the experimental class and the control class were basically the same before the ideological and political teaching experiment based on the PBL teaching method was carried out. Table 2 The independent sample statistics of the pre-test of the experimental class and the pre-test of the control class:

Table 2. Comparative statistics of the pre-test scores of the experimental class and the control class independent sample test

		Levine's test for equality of variances		t-test for equality of means						
		F	salience	t	degrees of freedom	salience (double tail)	mean difference	standard error difference	95% confidence interval for the difference lower limit	95% confidence interval for the difference upper limit
Comparison of the results of class 15 and class 16	Homogeneity of variances assumed	.058	.810	.151	68	.881	.34286	2.27744	-4.20171	4.88742
	Homogeneity of variances not assumed			.151	67.988	.881	.34286	2.27744	-4.20172	4.88744

It can be seen from Table 2 that before the course "Linux Principles and Applications" uses the ideological and political teaching mode based on the PBL teaching method, the sig value of the experimental class and the sig value of the control class are both significant. 0.881, indicating that the students in the two classes are basically the same in terms of learning level, and can be used as parallel classes to conduct control experiments.

On the other hand, a paired sample test was conducted on the pre-test and post-test scores of the experimental class and the control class to verify whether the changes in the scores of the experimental class and the control class were significant. Table 3 is the paired sample statistics of the pre- and post-test scores of the two classes:

Table 3. Paired sample statistics of the pre- and post-test scores of the two classespaired samples test

		paired difference					t	degrees of freedom	salience （double tail）
		average value(E)	standard deviation	standard error mean	95% confidence interval for the difference lower limit	95% confidence interval for the difference upper limit			
pair 1	15th class test results - Class 15 final grades	-26.71429	12.97638	2.19341	-31.17183	-22.25674	-12.179	34	.000
pairing 2	Class 16 results - Class 16 final grades	-11.74286	13.04369	2.20479	-16.22352	-7.26219	-5.326	34	.000

It can be seen from Table 2 and Table 3 that after one semester of experiment of the course ideological and political teaching mode based on the PBL teaching method, there is a very significant difference in the pre- and post-test scores of the experimental class. It can be shown that the course ideological and political teaching based on the PBL teaching method in the course "Linux Principles and Application" has greater advantages.

5. Conclusion

Through comparative practice in the 15th and 16th classes of the software engineering major in private application-oriented undergraduate colleges, the teaching of the 15th experimental class of the course has achieved good results, and the students' hands-on ability, team assistance ability, engineering application ability and innovation. Ability is significantly improved. In the future, we will continue to explore and improve the ideological and political teaching mode of the course "Linux Principles and Applications" based on the LPBL teaching method, and continuously improve the teaching quality and teaching effect of computer majors.

References

[1] Muhammad Talha Awan,Kashaf Khan. Linux vs. Windows: A Comparison of Two Widely Used Platforms[J]. Journal of Computer Science and Technology Studies,2022,4(1).

[2] Sandra Henry-Stocker. Using the Linux look command to select lines from files[J]. Network World (Online),2022.

[3] Wang Ying Jie,Yin Liang Ze,Dong Wei. AMCheX: Accurate Analysis of Missing-Check Bugs for Linux Kernel[J]. Journal of Computer Science and Technology,2021,36(6).

[4] Sandra Henry-Stocker. Learning to script on Linux using bash[J]. Network World (Online),2022.

[5] Sandra Henry-Stocker. Using the Linux look command to select lines from files[J]. Network World (Online),2022.

[6] Sandra Henry-Stocker. Using the xargs command on Linux to simplify your work[J]. Network World (Online),2021.

[7] Sandra Henry-Stocker. Looking at your Linux system's network interface with ethtool[J]. Network World (Online),2021.