Research on the Construction of Micro Course Resources for Linux Operating System Application Courses Guided by Project Driving

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Abstract. This article focuses on the teaching methods and modes of Linux operating system courses, and proposes a project driven micro course design and production method. Based on the actual work tasks of enterprises, it introduces the integration of specific cases into teaching micro course design practice from various aspects such as resource construction objectives and construction ideas. The aim is to provide reference and guidance for the construction of micro course resources in computer related professional courses, and help students improve learning efficiency.

1. Construction background

The Linux operating system is one of the most widely used operating systems in today's era, and its good security, stability, and openness make it widely used in the server field. Therefore, Linux operating system is a popular course offered by many universities, but with the rapid development of technology, the students trained by traditional teaching methods can no longer meet the actual needs of enterprises, mainly manifested in (1) the teaching content, teaching system, professional knowledge, ability and quality cannot meet the development requirements of Linux operating system. (2) The application of Linux operating system is becoming increasingly widespread, forming a group of professional positions for Linux operating system application. A single training goal can no longer meet the needs of the modern Linux operating system market well. (3) The division of labor is becoming increasingly detailed, and the requirements for job skills are becoming higher and higher. Therefore, the teaching methods of Linux operating system courses must adopt reform measures to achieve professional teaching mode reform, in order to meet the needs of market talents. So how to better optimize the teaching content and professional training system, and cultivate more applied talents that meet the needs of the industry for society, has become the primary task of Linux operating system curriculum construction and reform. Although Linux operating system courses have been offered in universities for many years, there are still some problems in the teaching process. On the one hand, there is a problem with the teaching of theoretical knowledge. Due to the limited social experience of students, their knowledge is narrow and they cannot fully understand the content of the textbook. On the other hand, there is a problem of teachers having a single teaching content and method. Therefore, the proportion of project-based teaching should be increased during the teaching process, thereby increasing students' interest in learning.

With the arrival of the era of "Internet plus", the new online learning mode based on the networked curriculum resource platform has become an important way of contemporary innovative teaching [1]. How to optimize students' learning methods and improve learning efficiency is the main issue that needs to be considered in the construction of micro course resources. Traditional teaching models can no longer meet the teaching requirements of today's university students. Due to the weak foundation of students, simple theoretical courses become dull and boring, and students are unable to understand and adapt to the teaching progress. However, operation courses without theoretical foundations cannot meet the needs of students for self-improvement and adaptation to social development. Therefore, we should start from the characteristics of college students and introduce real-life cases and projects to think about and solve practical problems. The difference between project-based teaching and other teaching methods lies in its emphasis on cultivating students' professional abilities and team qualities. The teaching design process is centered around projects, and theory is integrated into the process of creating project teaching scenarios. Students engage in exploration activities through the implementation of projects. The entire process of project teaching is student-centered, and teachers only play a role in guiding and promoting students to build knowledge, fully cultivating their self-learning ability and innovative consciousness, Enable students to apply their theoretical knowledge to solve practical problems. Project driven micro course resource construction should be based on real enterprise projects, using work processes as carriers, reconstructing the original course setting mode, and video recording content should be
project task oriented and vocational competency oriented course teaching content. This article focuses on the construction of micro course resources for Linux operating system courses, introducing typical design cases from enterprises in teaching. Through teacher guided student participation, a three in one teaching model of “theoretical learning, case integration, and ability improvement” is carried out. Industry standards, operating norms, and other aspects are integrated into the recording process to gradually cultivate students' professional skills and qualities.

2. Construction purpose

2.1. Improve learning efficiency

Through project-based teaching, students can change their original learning mode from passive to active. Through simulation of typical job positions and task decomposition in class, students can fully mobilize and guide their project analysis ability, enabling them to actively participate in knowledge learning. With the aim of solving practical problems, it drives the deepening of theoretical learning and vocational skills, achieving the goal of improving learning efficiency.

2.2. Improve teaching resources

By introducing real project-based cases from enterprises, revising the curriculum standards, overall design, unit design, and other teaching documents for Linux operating system courses, improving the teaching reform teaching mode and methods, and based on this, completing the recording of course related question banks and videos, constructing an online course resource website, and further improving teaching resources.

2.3. Deepen school enterprise cooperation

To carry out project-based teaching, it is necessary to conduct enterprise research and deep cooperation with enterprises in order to introduce industry standards related to enterprise courses and project cases into micro course video recording. Through communication with enterprises, the aim is to combine the advantages of talent cultivation in schools and enterprise research and development, and cultivate practical talents in the new era[2]. School enterprise cooperation can not only help students understand the latest technologies and development directions in the industry, but also strengthen the depth of school enterprise cooperation, achieving the goal of deepening school enterprise cooperation.

2.4. Improve students' practical abilities

Closely collaborate with enterprises, actively carry out school enterprise cooperation, carry out project-based teaching, and implement a project-based talent training model. Reforming traditional teaching methods and methods, establishing a student-centered and student-centered teaching model, guided by professional needs, focusing on practical ability cultivation, and combining industry, academia, research, and application as a means, integrating teaching, diverse teaching methods, advanced teaching methods, and open training channels. Convert real engineering projects of the enterprise into teaching cases, and jointly design and implement project implementation plans that are conducive to the development of the enterprise's business and the cultivation of professional talents. Carry out a teaching model guided by professional needs, with a focus on cultivating practical abilities, combining industry, academia, research, and application as the approach, integrating teaching and practice, diverse teaching methods, advanced teaching methods, and open training channels.

2.5. Strengthen the construction of teaching staff

Project driven teaching resource construction requires participating teachers to have relevant experience in enterprises. Through the construction of micro course resources in courses, teachers can not only participate in teaching and research work, but also deepen their learning in enterprises. The subsequent promotion of online course resources can also enable young teachers to learn this course and achieve the goal of strengthening teaching staff.

3. Constructive idea

This course adopts a task driven and project led approach in the overall course design and implementation process. The task projects designed in the course are drawn from real engineering project cases of enterprises and refined. Each project can be decomposed into several sub tasks, and in the preparation stage of each task, there is task background, task related knowledge, and task analysis as a foundation; The process, steps, and description of task implementation are detailed, accompanied by the acceptance method of the task, which conforms to the general rules of engineering project organization and implementation. At the same time, referring to the existing industry standards and qualifications for network engineers, curriculum standards are formulated, teaching processes are designed, teaching conditions, and course evaluations are meticulously designed, teaching methods and implementation processes are improved, so that high-speed technological innovation in the industry can be timely and accurately reflected in practical teaching, reflecting the consistency between course design, talent cultivation, and enterprise needs[3]. The construction ideas of micro course resources for Linux operating system courses mainly include enterprise demand orientation, teaching method design, micro course content design, micro course time control, video production team and production process design, etc.
3.1. Update teaching philosophy

The goal of curriculum resource construction should clearly connect with relevant industries and regional economic and social development, track the forefront of industries, serve the transformation and upgrading of enterprises, deeply analyze the dynamic relationship between industrial development and talent cultivation, scientifically judge the training of technical and skilled talents from the aspects of quantity, structure, quality, etc., and establish a mechanism for coordinated development of curriculum positions and industries. Guided by enterprises, integrating practical teaching resources, and exploring the "dual subject, dual integration, and diversification" talent training model. Grasp the trend of industrial development, target cutting-edge technologies in the industry, fully integrate elements such as industry, industry, enterprise, profession, and practice, establish a scientific and perfect teaching system, innovate practical teaching content, teaching methods, and teaching methods.

3.2. Enterprise demand orientation

The construction of micro course resources should be guided by enterprise needs. Enterprises have a keen perception and insight into market demand, and can bring the latest application technologies, operating standards, and processes of Linux operating system into the classroom[4]. The dual education of school enterprise cooperation plays a crucial role in the current cultivation of technical and skilled talents. As the main battlefield for cultivating technical and skilled talents, universities bear the responsibility of providing talent support for innovation driven development. To make innovation and production more closely integrated, it is necessary to vigorously promote vocational education school enterprise cooperation and cultivate new driving forces for innovative development[5].

3.3. Reform of teaching content

Collaborate with industry enterprises, integrate professional qualification standards, introduce new achievements and requirements of industrial development and technological progress, update teaching content in a timely manner, build a teaching model based on the cultivation of students' comprehensive qualities and professional abilities, combine theory with practice to develop high-quality project cases for courses, and promote the connection between professional course content and professional standards. Fully utilize information technology to develop teaching resources such as online courses, teaching resource libraries, and high-quality textbooks. Implement task driven and action oriented teaching modes such as project teaching, case teaching, and simulation teaching.

3.4. Collaboration between schools and enterprises

Based on the diversity of college students and differences in learning abilities, we will closely focus on the characteristics of students and construct curriculum resources that integrate the characteristics of schools, enterprises, majors, and teachers. Course resources should start from the perspective of students, with the aim of cultivating high-quality talents, closely following the development needs of the Linux operating system industry, and combining with the requirements of enterprise positions, school enterprise collaborative development of Vick resources for courses, jointly creating practical projects with enterprises, combining the advantages of enterprise technology leadership with the training of Linux operating system application talents, and cultivating high-quality technical and skilled talents with strong professional comprehensive qualities and adapting to social development.

3.5. Teaching Method Design

Based on the traditional Linux operating system teaching system and sufficient job demand research, this course introduces typical job processes and industry certification standards for network engineers corresponding to employment positions. Fully leverage the technological advantages of Linux operating system, introduce actual project cases from enterprises in the teaching process, adjust course evaluation standards appropriately according to the characteristics of professional grade and learning level, set different teaching objectives, and build a progressive course system. In the classroom, provide practical training for students through real enterprise cases or projects, and achieve the goal of improving their professional abilities.

3.6. Micro course content design

The construction content of Linux operating system course resources should revolve around a certain knowledge point in the textbook and be designed with real project cases from enterprises, which can better meet the personalized learning of students for different knowledge points, select learning according to their needs, and is not limited by time and location. Self learning can be conducted through videos before and after class; Cultivate students' ability to discover, analyze and solve problems.

3.7. Micro course time control

The recording time of micro lesson videos should not be too long or too short, and the duration of each micro lesson should be 5-8 minutes. Usually, when students concentrate on watching micro lessons for more than 8 minutes, their attention gradually decreases. However, if the duration of micro lessons is too short, it is difficult to explain the knowledge points clearly, resulting in students being unable to understand the knowledge...
points. Therefore, the recording time of micro lessons should be controlled within 5-8 minutes[6].

3.8. Video production team

The professional title structure of members should be reasonably configured and have years of teaching or student management experience. During the research phase of the project, team members should not only learn and improve themselves, but also engage in in-depth enterprise training, participate in enterprise practice, special technical training, professional technical exchange meetings, and other projects to enhance the practical ability of teachers, and synchronize teaching content with new technologies, new processes, new standards, and new products. Integrate actual project cases of enterprises into the curriculum, carry out project-based teaching, align with the industry and society, improve students' professional skills, and strive to build course resources.

3.9. Video production process design

Micro courses are a new type of online video courses designed to support multiple learning methods for a specific knowledge point or teaching process, using micro short videos as a knowledge carrier[7]. Preparation work is required in the early stage of micro course videos. Firstly, it is necessary to sort out and complete the knowledge points of the course and relevant project cases of the enterprise; Secondly, it is necessary to collect materials such as images, documents, and background music, and think about how to reflect them in the knowledge points of micro courses; Finally, the production of micro lesson videos mainly includes the planning and design stage, video production stage, video testing stage, and video release stage of micro lessons. The testing stage of the video is particularly important throughout the entire process. In the early stages of video production, after multiple student tests and feedback, the design of the video is readjusted. Only when the testing results are good can it be put into production.

4. Conclusion

Micro courses are an inevitable result of the rapid development of information technology and online education. They are a new teaching model with characteristics such as universality, convenience, and practicality[8]. It is particularly important to build micro course resources in response to the current stage of online education. Therefore, the author proposes a project driven approach to the construction of micro course resources, hoping to improve the quality of talent cultivation, as well as the professional ability and industry competitiveness of students, and adapt to the development trend of society through the research and promotion of this article.