

Research and Practice on Project-based Teaching Reform for Cloud Computing Technology Application Specialty in Higher Vocational Colleges

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Abstract: The three-education reform is an important starting point for higher vocational colleges to improve the quality of college running and personnel training. As the core of the three-education reform, project-based teaching is the key to the reform success. Cloud computing technology application specialty organically combines professional theoretical knowledge and professional practical skills required by the specialty through project-based teaching reform. It achieves the goal of cultivating student practical skills and ability to analyze and solve problems, and cultivates student innovation ability in the process of completing the project. Through the project-based teaching reform, an innovative teaching team of valuing teachers' ethics, being good at teaching, strengthening scientific research and meeting service has been formed. It has enhanced the team members motivation, stimulated vitality, formed pressure and cultivated sustainability. Through the project-based teaching reform, the specialty group has become a provincial high-level specialty group. The reform achievements have won the provincial teaching achievement award, the students' skills have been improved, and two first prizes in the vocational college skills competition have been won.

Keywords: Project-based teaching reform, Craftsmanship workshop, Modern apprenticeship, Cloud computing technology application specialty, Sydney accord paradigm, Three-education reform.

1. Introduction

With the advent of the new infrastructure era, cloud computing technology ushers in a golden age. The Internet big data center and intelligent computing center have formed a powerful computing infrastructure [1-2]. The productivity is formed through cloud computing technology, which plays an increasingly important role in social production and peoplelife.

Compared with the rapid development of cloud computing, the training of cloud computing talents in colleges and universities is far from enough [3]. Cloud computing talents in China are in the shape of olive, that is, there is a lack of high-level architecture talents, as well as a large number of IT blue-collars engaged in cloud operation and maintenance. Higher vocational education is the main base for training cloud computing blue collar talents. From this perspective, the cloud computing technology application specialty in higher vocational colleges is also facing a rare opportunity. But at the same time, the major is also facing many external challenges, and the graduates are often unable to find professional counterparts. The employment situation of students is not optimistic. There are not only external challenges such as system, source of students and industry, but also internal problems such as teachers, teaching methods and textbooks. The comprehensive influence of these factors makes the cloud computing students have problems such as lack of professional and technical ability, lack of ability to solve problems independently, weak communication ability, and weak professional ethics and discipline, which seriously affect the employment of students [4].

In order to continuously deepen the reform of "three education" in the major and achieve the goal of high-quality talent training, the cloud computing technology application

speciality started the project-based teaching reform from 2019. The core of the reform is to realize the transformation of talent cultivation from a knowledge system to a capacity system, with knowledge as the standard of applicability, usefulness, usefulness and adaptability to the needs of capacity cultivation. Through three years of project-based teaching reform, the quality of talent training has been improved, the employment quality of graduates has been improved in all aspects, and the innovation and entrepreneurship ability of students has been significantly improved.

2. Problem Solving and Construction Ideas

2.1. Problems solved

The problems urgently needed to be solved in the construction of cloud computing technology application specialty is as follows.

The curriculum system, teaching content and industrial development demand are not suitable. Cloud computing technology is updating rapidly, and the demand for information technology posts is constantly changing [5]. The curriculum system and teaching content cannot meet the needs of industrial development.

The teachers engineering practice ability does not match the demand for high-quality teaching project development. The teachers' practical ability is weak, the project development experience is insufficient, the integration of science and education is difficult to implement, and the enthusiasm of project-based teaching reform is not high.

A single talent training model is not suitable for the diversified career development needs of students. The talent training mode is relatively single, and the diversity of student

sources and individual differences of students are not fully considered.

2.2. Construction ideas

By utilizing the Sydney accord speciality construction paradigm [6], a project-based teaching talent training system based on the idea of student-centered, achievement orientation and continuous improvement is constructed.

(1) To reshape the talent training objectives and specifications based on the demand of cloud computing industry. Combining the different requirements of the three elements of knowledge, ability and quality, the four modules of general education, professional education, quality development and social practice, and the two dimensions of specialty and expertise, determine the talent training goals that meet the needs of students' career development and can support students' diversified excellence.

(2) By utilizing on the Sydney accord paradigm, and depending on the training objectives, the modular curriculum system and content should be reconstructed in a result oriented and competency-based manner. Connect with the latest technological development trend of the industry, and deepen the curriculum content reform and teaching design driven by the project.

(3) According to the characteristics of industrial development, deepen the integration of industry and education, dual education between schools and enterprises, and improve the professional talent training mode through modern apprenticeship, craftsman post and tutorial system.

(4) Based on the student-centered teaching concept, we will thoroughly change the current teaching situation of full room teachers, practically promote the integration of theory and

practice teaching reform, make full use of various online resources, and combine information-based teaching methods to enrich classroom teaching forms.

(5) The student evaluation standard is reformed. The speciality establishes an evaluation system that meets the requirements of the training model for cloud computing technology application professionals and supports the realization of student training objectives, explore the mechanism for identifying, accumulating and transforming students' learning achievements, pilot the 1+x certificate system, and replace relevant module courses with x certificates.

3. Implementation Path

3.1. Reconstruct the project-based curriculum system

As shown in Figure 1, the curriculum system of engineering practice ability training based on project-based teaching is reconstructed by taking productive projects as the source and following the laws of education and teaching.

The organization and management structure of the 1+X certificate system for cloud computing is improved, work processes and work standards are standardized, a cooperative mechanism with relevant industry associations is established, and a sound 1+X certificate operation mechanism and quality assurance mechanism is built. The speciality encourages students to actively take the cloud vocational skill level certificate, expand the employment field and expand the entrepreneurial ability.

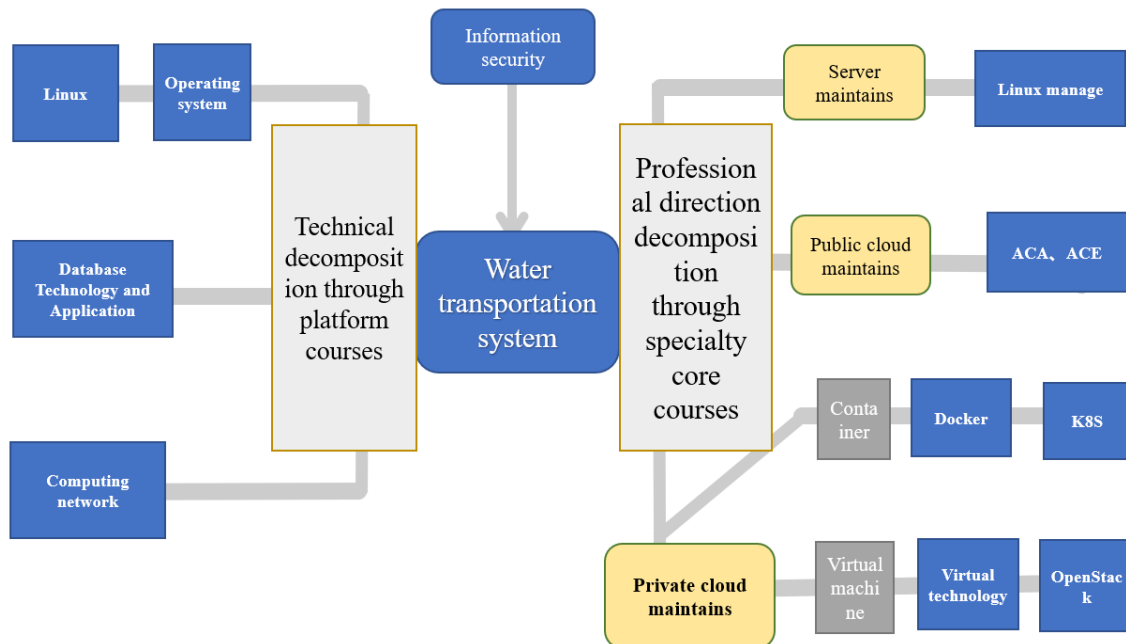


Figure 1. The curriculum system of cloud computing technology application specialty based on project-based teaching

3.2. Constructing hybrid teaching method based on SPOC

According to the cognitive needs of different students, the SPOC hybrid teaching method driven by skills competition task is constructed as shown in Figure 2. Using a blended and personalized teaching mode, integrating skills competition

projects, combining traditional teaching with flipped teaching, and dynamically combining teaching content with student-centered can enable students to learn according to their own needs and rhythm, and achieve the combination of overall guidance and individual guidance, as well as the transformation to the learning-oriented teaching mode.

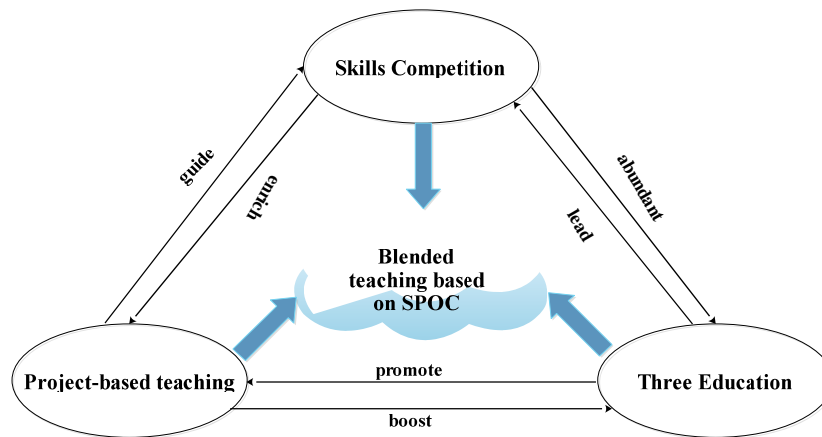


Figure 2. The hybrid teaching method based on SPOC

Because different courses contain different knowledge and ability modules, and different knowledge and ability modules correspond to different teaching modes [7], all relevant professional platform courses, professional courses, and professional direction courses of the cloud computing professional group are analyzed and disassembled into different knowledge and ability modules, and corresponding teaching modes are adopted according to the classification. Since most courses involve multiple knowledge and ability modules, most courses adopt a mixed learning mode. Four types of teaching modes are built, which includes completely autonomous learning mode, autonomous learning + teaching mode, autonomous learning + teaching mode + project mode and completely project-based teaching mode.

3.3. Create craftsman workshop under modern apprenticeship mode

The specialty jointly builds workshops with enterprises. By the introduction of enterprise technical backbone, project-based course resource construction, real business project introduction, school enterprise scientific research cooperation and other ways, enterprise engineers, teachers and students form a craftsman post team to jointly complete enterprise technical service innovation, participate in external industry horizontal project research and development, accumulate project experience and improve teachers' professional skills, scientific research ability and social service ability, Improve students' professional and technical skills.

The workshop takes specific projects as the carrier, takes work tasks as the driving force, organically combines theory with practice, so that students can master knowledge and skills in the process of completing tasks; At the same time, the workshop also gives full play to the talents and discipline advantages of colleges and universities. As a project incubator in the college, it actively opens professional industries, closely combines industry with teaching, and realizes the active integration of colleges and universities into local economy and local construction.

3.4. Teachers participate in real projects of enterprises

The specialty adopts the mode of school enterprise cooperation and collaborative training, adhere to the educational concept of "internal training and external introduction", give full play to the respective advantages of higher vocational colleges and excellent first-line enterprises,

and both schools and enterprises establish the workshop base mode, introduce technical backbone from enterprises as part-time teachers to undertake professional practical training courses, and at the same time, carry out dual qualification training for key teachers to achieve the continuous development of professional skills of dual qualification teachers, Promote the development of teacher training mode.

4. Conclusion

Project-based teaching reform is an important starting point for higher vocational colleges to improve the quality of running schools, an important starting point to improve the quality of talent training, and a key core to realize the transformation of students' knowledge system to ability system. As the nervous system of training professional talents, the project-based teaching reform is the trunk of the modern vocational education system framework. The "three education reform" is the "muscle" of subtlety and strength. The combination of the three will certainly stimulate the infinite potential of vocational education innovation and generate new energy.

With the rapid development of cloud computing technology, the uneven and changing source of higher vocational students requires the continuous progress of professional project-based teaching reform to adapt to changes. Teachers need to constantly improve and reflect on the project-based teaching reform, constantly track the development of the industry, tap the ideological and political elements of the curriculum, so that the teaching content can better meet the requirements of the post, and the teaching activities can be more acceptable to students.

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