

Original Research Article

Research on the teaching reform path of cloud computing and web development course based on project driven approach

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Abstract: With the rapid development of cloud computing and web development technologies, traditional teaching methods can no longer meet the industry's demand for talents. Project-driven teaching method, as a teaching approach that emphasizes the combination of practice and theory, has shown significant advantages in cloud computing and web development courses. This paper deeply analyzes the challenges faced by current cloud computing and web development course teaching, expounds the theoretical basis of project-driven teaching method, and proposes a reform path for cloud computing and web development courses based on project-driven teaching from the aspects of curriculum design, teaching implementation, and evaluation system, aiming to provide references for improving the quality of course teaching and cultivating high-quality talents that meet the needs of industry development.

Keywords: Project-driven; Cloud computing; Web development; Teaching reform

1. Introduction

In the digital age, cloud computing and web development technology have become the core driving forces for innovative development in various industries. Whether it's e-commerce, social media, enterprise informatization, or IoT applications, they all rely on the support of cloud computing and web development technology. With the continuous advancement of technology and the expansion of application scenarios, the demand for cloud computing and web development talents in the market is growing day by day, and the requirements for talents' abilities are also increasing. As an important base for talent cultivation, universities bear the responsibility of delivering qualified professional talents to society. However, there are many problems in the current teaching of cloud computing and web development courses, such as the disconnect between teaching content and actual needs, single teaching methods, and insufficient practical abilities of students, which make it difficult for graduates to meet the employment needs of enterprises. Therefore, exploring the reform path of project-based cloud computing and web development course teaching has important practical significance.

2. Current status of cloud computing and web development course teaching

The teaching method is single, and the traditional teaching mode is mainly based on teacher lectures, with students passively receiving knowledge^[1]. In the classroom, teachers often focus on imparting theoretical knowledge while neglecting the cultivation of students' practical abilities. Students lack opportunities for active thinking and exploration, resulting in low learning motivation. In addition, teaching methods lack interactivity, and there is less communication between teachers and students, making it difficult to understand students' learning needs and confusion, and unable to adjust teaching strategies in a timely manner.

The practical aspect is weak, and cloud computing and web development are highly practical disciplines that require students to master relevant skills through extensive practice. However, there are currently many problems in the practical aspects of many universities. On the one hand, there is a lack of practical equipment and

complex cloud computing experimental environments, making it difficult for schools to provide sufficient resources for students to carry out practical operations. On the other hand, practical projects lack practical significance and are mostly confirmatory experiments. Students cannot access the real project development process, making it difficult to cultivate the ability to solve practical problems.

The evaluation system is not perfect, and the existing evaluation system mainly focuses on exam scores, emphasizing the assessment of students' theoretical knowledge, while neglecting the evaluation of students' practical and innovative abilities. This single evaluation method leads to students only focusing on theoretical learning and neglecting the cultivation of practical abilities, which is not conducive to their comprehensive development^[2].

3. Theoretical basis of project driven teaching method

Project driven teaching method is a student-centered and project-based teaching approach that involves students in the development process of actual projects, enabling them to learn and master knowledge through practice. Its theoretical basis mainly includes constructivist learning theory, situational learning theory, and cooperative learning theory. Constructivist learning theory holds that learning is a process in which learners actively construct knowledge. Through collaboration and communication with others in a certain context, learners continuously construct and improve their own knowledge system. The situational learning theory emphasizes that learning should be combined with actual situations, and learners can better understand and apply the knowledge they have learned in real situations. The cooperative learning theory holds that learners can learn from each other, inspire each other, solve problems together, and improve learning outcomes through cooperation^[3].

4. The Teaching reform path of cloud computing and web development course based on project driven approach

Course design involves selecting representative, practical, and challenging projects based on the development trends of cloud computing and web development technologies and the actual needs of enterprises. The project can cover multiple aspects such as cloud computing platform construction, web application development, and big data processing, such as developing a cloud based e-commerce platform and building a distributed web application.

The second is knowledge integration, which integrates relevant knowledge of cloud computing and web development into projects, enabling students to systematically learn and master knowledge in the process of completing projects. In the cloud computing platform construction project, knowledge related to virtualization technology, distributed storage, container orchestration, etc. is involved; In web application development projects, knowledge is involved in front-end development techniques, back-end development frameworks, database design, and more.

The third is difficulty grading, which divides projects into different difficulty levels based on students' foundation and ability level, such as beginner, intermediate, and advanced. Students can choose suitable projects for learning based on their actual situation, ensuring that each student can gain something from the projects.

Teaching implementation involves project introduction, where the background, objectives, and requirements of the project are introduced to students at the beginning of the course to stimulate their interest and enthusiasm for learning. At the same time, provide students with necessary technical support and resources, such as development tools, documentation, etc.

The second is team collaboration, dividing students into small groups, with each group responsible for the development of a project. In the group, students can take on different roles based on their strengths and interests, such as project manager, developer, tester, etc. Through team collaboration, cultivate students' communi-

cation skills and teamwork spirit.

The third is process guidance. During the project development process, teachers regularly guide and inspect students, promptly identify problems they encounter, and provide solutions. At the same time, encourage students to explore and solve problems independently, cultivate their innovation and problem-solving abilities.

The fourth is achievement display. After the project is completed, each group will present their achievements, introducing the development process of the project, the problems encountered and their solutions, and the project results. Through the display of achievements, students can learn and communicate with each other, improve their expression and summarization abilities.

One of the evaluation systems is diversified evaluation, establishing a diversified evaluation system that comprehensively considers students' project completion, teamwork ability, innovation ability, practical ability, and other aspects. The evaluation method can adopt a combination of teacher evaluation, student self-evaluation, and student peer evaluation to ensure the objectivity and impartiality of the evaluation.

The second is process evaluation, which focuses on evaluating the development process of student projects and providing timely feedback on students' learning progress. For example, evaluating students' participation, problem-solving ability, code quality, etc. in the project development process. Through process evaluation, guide students to focus on the learning process and improve learning outcomes.

The third is summative evaluation, which comprehensively evaluates the project outcomes of students after the project is completed. The evaluation content includes the project's functional integrity, performance indicators, user experience, and other aspects. The final evaluation results are an important component of students' course grades.

5. Case analysis of teaching reform practice

This study was applied in a web development course at a certain university and achieved good teaching results. The course adopted a project-based teaching method. During the teaching process, the teacher chose to develop a cloud based online education platform as the project and divided the students into groups for development. During the project development process, teachers provided students with guidance on using cloud computing platforms, training on web development techniques, and relevant knowledge of project management. Through team collaboration, students have completed tasks such as platform architecture design, front-end development, back-end development, and database design. After the project was completed, students presented their achievements and received evaluations from teachers and classmates.

Significant results have been achieved through teaching reform practices. The students' learning enthusiasm has significantly improved, and their ability to actively participate in project development and solve problems has been exercised. The students' teamwork and communication skills have also been improved. After the course, students will have a more solid grasp of cloud computing and web development technology, and be able to independently complete the development of practical projects.

6. Conclusion

The teaching reform of project driven cloud computing and web development courses is an inevitable requirement to adapt to the development of the industry. Through reforms in curriculum design, teaching implementation, and evaluation system, it is possible to effectively solve the problems existing in current curriculum teaching, improve teaching quality, and cultivate high-quality talents that meet industry needs. In future teaching practice, continuous exploration and innovation should be carried out to further improve the project driven teaching mode, providing strong talent support for the development of cloud computing and web development fields.

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