

Design and implementation of a cloud computing based vocational college course teaching practice platform

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Abstract. In recent years, China's vocational college education informatization construction has achieved significant results, but there is still a certain gap with the requirements of university informatization construction and education development. Firstly, the foundation for the construction of a public service platform for professional course resources is relatively weak, and there are insufficient shared mathematical professional course resources; Secondly, the construction of information infrastructure in some vocational college lags behind, and there is a shortage of high-quality and shared course resources. In addition, the application rate of information technology in professional course resources in vocational colleges is relatively low, which cannot fully meet the actual needs of China's vocational college reform and development. This article applies the theoretical foundation and practical methods of cloud computing to research and design a cloud computing based vocational college course teaching resource platform.

Keywords: Cloud computing, Course resource sharing cloud platform, Vocational colleges.

1. Introduction

Online education has been developing for over 20 years [1], providing students with a platform for self-directed learning. However, the development status of online education course resource construction is not optimistic [2]. With the introduction of concepts such as educational informatization, modernization, and curriculum reform, the construction of online education curriculum resources has become a new research direction in education reform. With the deepening of online education courses, various online education resource platforms have spent a lot of manpower, material resources, and financial resources to collect online education course resources. However, these resources have not been effectively utilized, resulting in problems such as redundant construction of course resources on various platforms, limited applicable resources, uneven resource quality, and poor resource sharing effects due to structural alienation [3]. These problems cannot meet the needs of students for online self-directed learning, seriously restricting the pace of modern education development. To address the aforementioned issues, this article designs an online education course resource sharing platform based on cloud computing. The platform provides unified management and dynamic allocation services of different computing resources on the basis of the Internet [4], which is characterized by low cost, high efficiency and can handle massive resources [5]. It can achieve effective construction and management of massive online education course resources, refine physical resource allocation units through virtualization technology, improve the efficiency of online education course resource utilization, and enhance the application effect of online education course resource sharing platforms.

2. Online education course resource sharing platform

The online education curriculum resource sharing platform based on the cloud platform adopts the centralized management mode [7], and all schools can use the Internet connection platform to share platform hardware resources and obtain platform function services.

2.1. Platform architecture design

The design method for online education course resource sharing based on cloud platforms consists of four levels [8], from top to bottom: platform user layer, interface service layer, virtualization resource layer, and hardware device layer, as shown in “Fig. 1”.

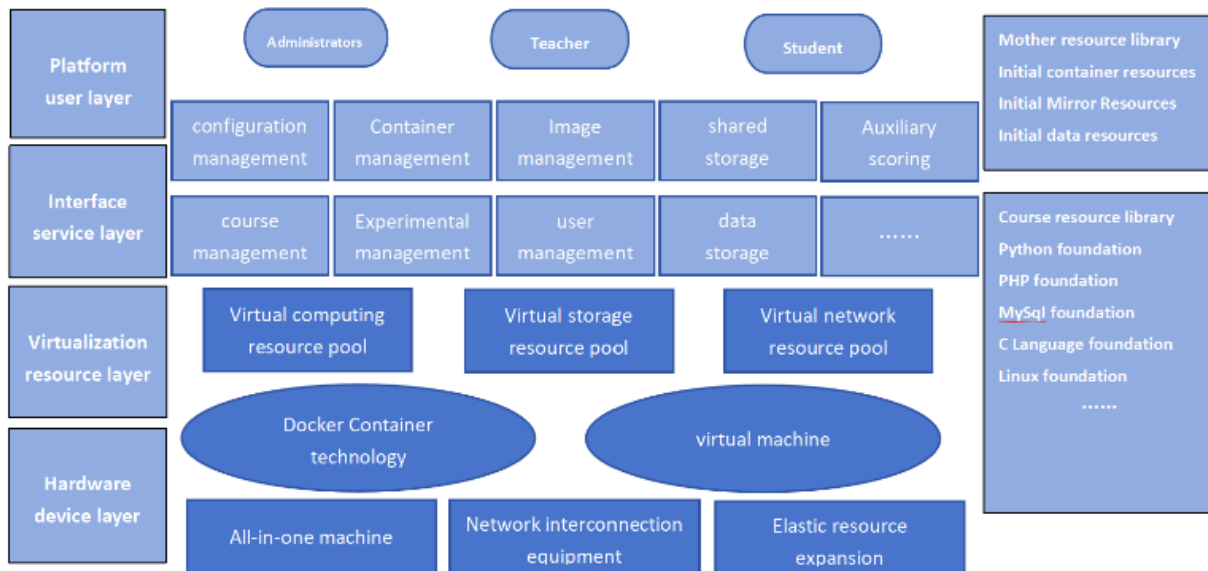


Figure 1. Architecture diagram of online teaching cloud platform.

The online teaching practice cloud platform is a teaching platform that integrates experimental management, experimental environment, and experimental resources. This platform realizes the entire lifecycle management of teaching experiments, including creating plans, configuring plans, conducting experiments, scoring experimental and evaluation reports, etc. Using this platform, teachers can easily create experiments, configure experiments, grade experimental reports, and grade evaluation questions; Students can efficiently complete experiments, write experimental reports online, conduct online tests, and other functions. This platform greatly reduces the workload of teachers and improves teaching efficiency. Students can efficiently complete experimental tasks, write experimental reports, and conduct ability assessments.

2.2. Platform functional design

In the process of designing platform functions, based on the differences in user permissions, the online education course resource sharing platform divides user functions into three modules: administrator, teacher, and student. Due to the different application needs of users, each module is divided into several sub functional modules, as shown in “Fig. 2”.

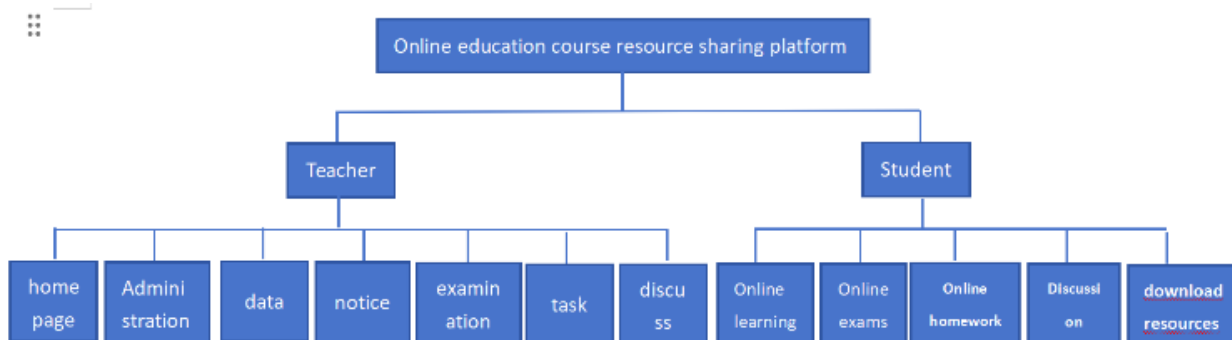


Figure 2. Functional module division.

The teacher function module consists of seven sub modules: homepage, management, materials, exams, and assignments; The student function module consists of five sub modules: online learning, online exams, and online assignments.

(1) Teacher Function Module: Teachers use management modules to manage content such as students, teams, courses, and live broadcasts; Implement functions such as exam paper editing, generation, import, distribution, and approval through the exam module; The main function of the homework module is to enable teachers to create, assign, approve, and compile student assignments; The data module stores teaching materials for students to download self-learning video content; The discussion module and notification module are respectively used by teachers to post discussion topics, reply to student questions, and publish management notices.

(2) Student Function Module: The online learning module in the student function module provides students with learning materials such as videos and courseware. Students can click on different videos or courseware according to their own needs to complete online learning; The function of the online exam module is consistent with the online homework module, both aimed at understanding the learning status of students [10]. The good or bad grades reflect the students' mastery of the knowledge points. When the grades are not ideal, they need to learn again in order to better grasp the knowledge points; The main function of the communication and discussion module is to provide an environment for communication between teachers and students, enhance students' independent thinking and cooperation abilities, and better achieve teaching objectives. The teaching resources downloaded by students using the teaching resource download module are teaching materials uploaded by teachers.

2.3. Functional implementation design

(1) Teacher login system: The teacher opens the browser and enters the cloud platform address in the address bar to access it. In the user login window of the login interface Enter the correct username and password, and click the "Login" button, as shown in "Fig. 3".

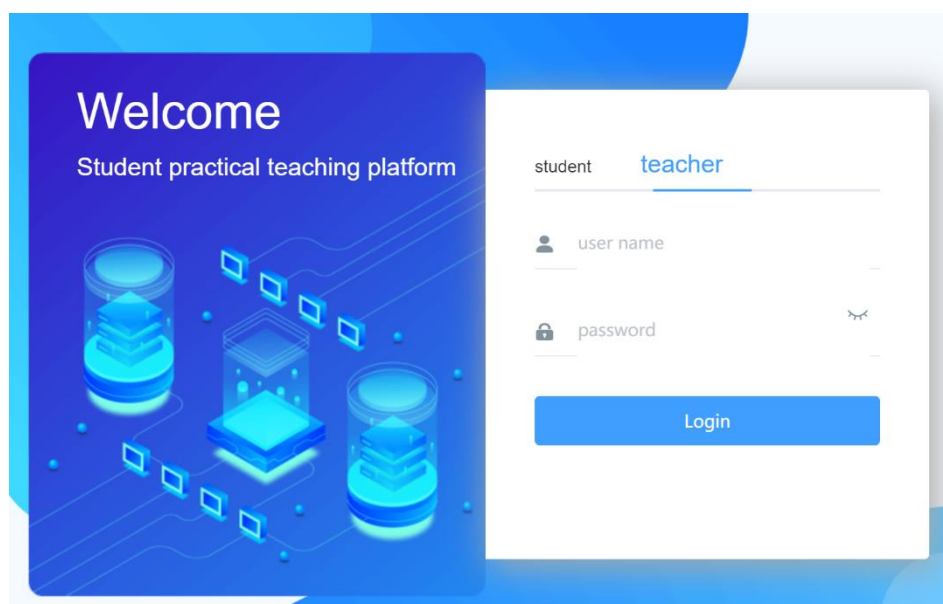


Figure 3. Teacher login module.

(2) Home page: The homepage has features such as start of class, start scheduling, to-do list, display of course schedule, teaching progress, core courses, and more Quick entry to the practical training case function module, as shown in "Fig. 4".

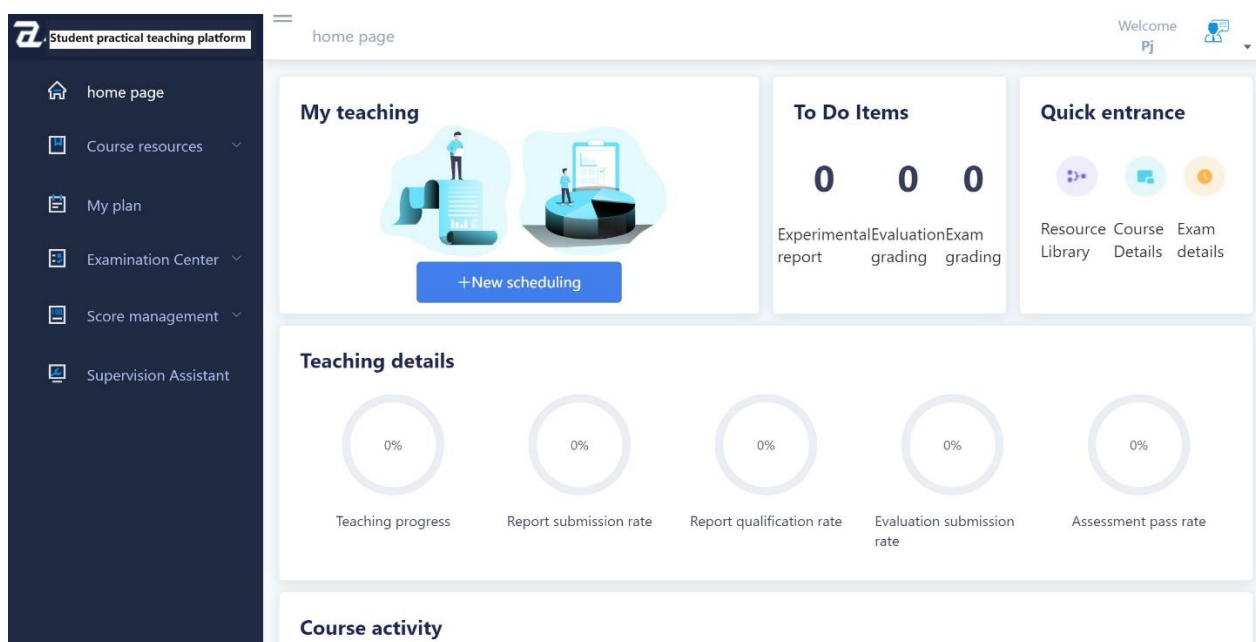


Figure 4. Homepage module.

(3) Course resources: In the resource list, you can view existing course resources and corresponding chapter directories, course standards, course documents, assessment questions, discussions, and other content, and configure course experimental tasks.

(4) Analysis of learning situation: Click on my plan and select the learning situation analysis based on the course name. You can view the overall progress of student learning and the course situation.

3. Conclusion

The continuous development of information technology and the continuous maturity of resource platform construction technology have greatly increased the popularity of online education course resource sharing platforms. As an emerging sharing infrastructure, cloud platform obtains a large number of available resources in the Internet through cloud computing technology and completes automatic management through software. This article designs an online education course resource sharing platform based on cloud platform, which is a user oriented shared online education platform designed with "cloud computing" technology as the design concept. The platform has a large number of shared resources, comprehensive content, and functional services that meet user needs. The application of online education course resource sharing has a good effect, which is of great help in enhancing teaching effectiveness and can effectively enhance educational equity.

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