

Construction and Application of Teaching Resource Platforms for Programming Courses in Higher Vocational Colleges

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Abstract

Implement research conclusions on the digital transformation teaching reform, build a teaching resource platform for program design courses in higher vocational colleges, strengthen the construction of curriculum resources for online auxiliary teaching and digital teaching design, promote online teaching organization and implementation centered on student learning, and promote students' mobile ubiquitous learning.

Keywords

Digital transformation; teaching resource platform; programming courses.

1. Requirement Analysis

The curriculum teaching resource platform is positioned according to the vocational and technical goals of higher vocational colleges, discussing requirements in modules and roles for the cultivation of professional abilities in software development. System administrators can set relevant data for system use, including assigning user roles and permissions; teachers can create and publish course teaching and teaching plans through the system, as well as monitor students' learning process, interact and communicate with students, and urge students to study; students can carry out learning, attend classes, submit learning plans, learning logs, learning experiences, and learning phase achievements through the system, complete independent learning. Specific functions are shown in the use case diagram. For a specific professional skill, such as the Python programming course, teachers organize resources, build learning modules, and students carry out modular learning. After learning, students submit their work products. The practice process adopts an enterprise-style organizational management model, manages the entire process of student operations, and the design of the topic includes "teaching resources organization - teaching model design - teaching plan arrangement - teaching process monitoring - teaching achievement display" four links. It incorporates all courses of the software technology major into a unified management scope, reasonably organizes practical training arrangements, and carries out monitoring and scientific, standardized unified management, facilitating managers and teachers to keep track of students' topic learning situations and track their effects.

1.1. Admin Function

Administrators are responsible for setting relevant parameters of the teaching resource platform, managing departments, user information, and the division of user role permissions. They can also send notifications, with the specific functional requirements analysis shown in Figure 1.

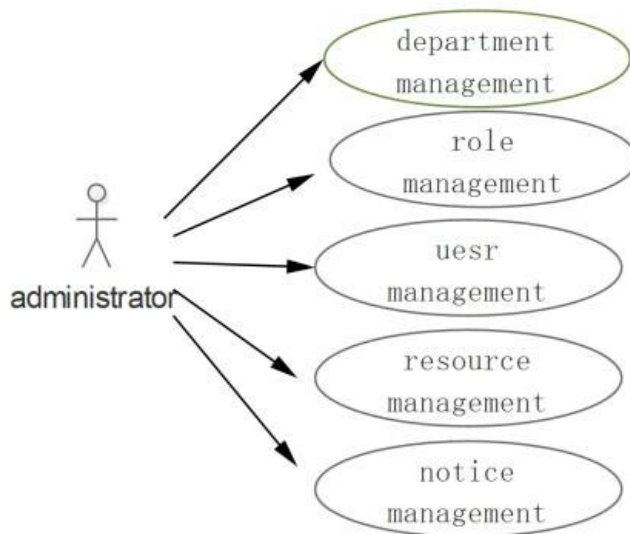


Figure 1. Administrator use case diagram

1.2. Teacher Function

The functional requirements of teachers are to manage teaching resources, organize and publish resources, manage the entire process of student learning, including the management of student submitted works, as shown in Figure 2.

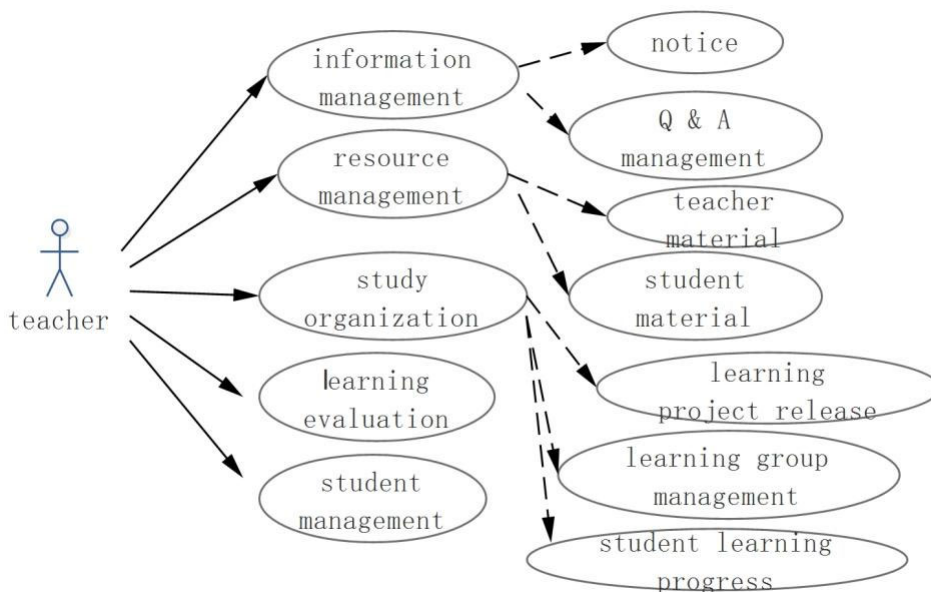


Figure 2. Teacher use case diagram

1.3. Student Function

Students can complete the following main operations: view all resource information of program courses, complete the operation of learning a certain module and personal information management, and can also complete the required experimental operations according to the teacher's requirements. The use case diagram is shown in Figure 3.

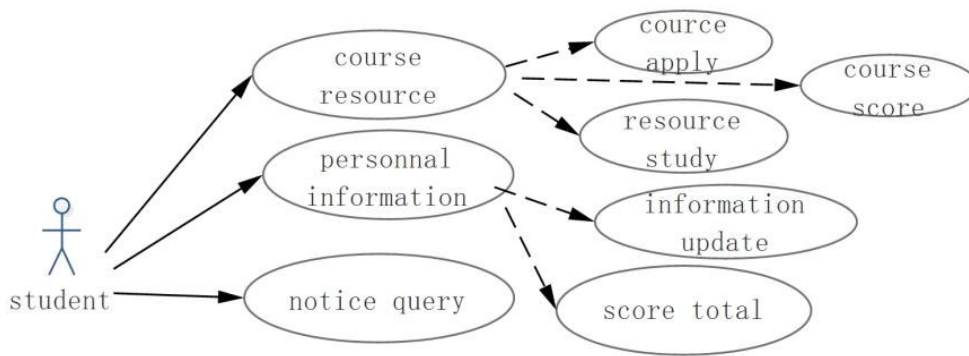


Figure 3. Student use case diagram

2. System Design

The teaching resource platform for program design courses changes the traditional teaching model. Teachers publish teaching topics through the platform, and students can independently build learning modules to complete learning requirements, achieve learning goals, and meet the requirements of software development positions. It is a preview and supplement to classroom teaching. For the learning of a certain topic resource, teachers are allowed to adopt a corporate management model for attendance, logs, plans, summaries, and other aspects of management. At the same time, it is also designed from the perspective of convenience in teaching, including resource management and release, division of learning tasks, organization and arrangement of topic learning, process control of topic learning, scoring, answering questions, etc.

2.1. Module function design

The system function module design diagram is mainly divided into seven parts: studying resource management, course management, user management, score management and etc, as shown in Figure 4.

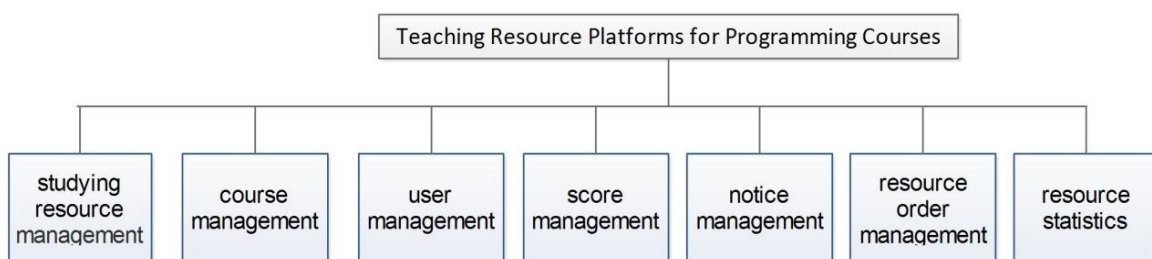


Figure 4. Teaching resource platform module function diagram

3. System Implement

The platform adopts MVC technology, with data stored in the MySQL database. The interface effects are shown in Figures 5, where Figure 5 is the architecture diagram of the system implementation. The browser presents the interface effects, controls the view layer data, provides data access operations through the data access layer, and actually accesses the data through DAO, which is stored in files or databases.

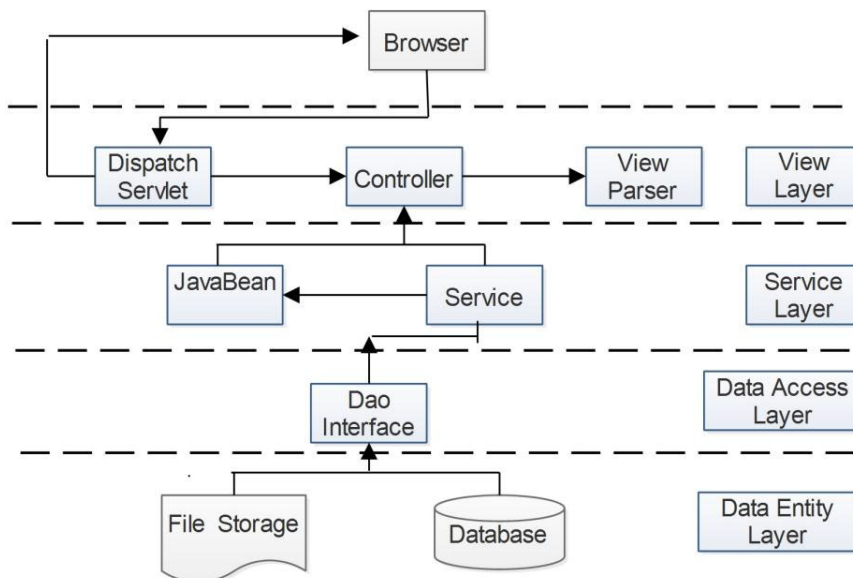


Figure 5. Implementation architecture diagram

4. Conclusion

In the context of the digital transformation of education, education is not only through classroom teaching models, but also needs to carry out teaching design and implementation by exploring how to improve learners' active learning mode. Program design course resource learning platforms explore learners' ubiquitous online and offline learning, advocate for students' active learning, independent learning, and cooperative learning, allowing students to complete personal in-depth professional learning through their own time and free space, transforming professional learning from teachers' passive requirements to students' active completion, and increasing interest in the profession as well as the depth and breadth of learning.

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