



Design of Financial Management Teaching System Integrated with Online Micro Class

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Abstract. In order to further improve the teaching quality of financial management courses in colleges and universities, the micro-class teaching system has been introduced. As a new type of curriculum resources, micro-course has the characteristics of simplicity and simplicity, which has injected new vitality into the development and development of education and teaching. Based on the characteristics of micro-course construction, this paper designs an open and interactive micro-course teaching system for financial management courses, including design objectives and principles, architecture, SQLServer2012 database, functional module design and so on. The test results show that under the application of the system, the function and performance can meet the teaching requirements, realize the multi-interactive sharing centered on teachers and students, and effectively improve the creativity and effectiveness of teaching activities in colleges and universities.

Keywords: Micro course · Financial management course · Teaching system

1 Introduction

With the continuous development of digital learning, multimedia has been widely used in traditional classrooms, and blended learning, which combines online learning with traditional classroom learning, has gradually become a learning trend. The characteristics of the network teaching system are that it can fully reflect the students' autonomous learning ability, can run through the concept of "autonomous learning" in the teaching process, provide a communication platform for teachers to "teach" and students to "learn", and become a "dual master" platform for students' autonomous learning with teachers as the main creator; in addition, it has good versatility, and can be suitable for the teaching of various disciplines; regardless of the user any knowledge of computer should be easy to use and safe enough. In order to ensure the correctness and security of the data and realize the distribution of time and space, the website content released to the outside world should adopt protection measures such as identity authentication and upload content authentication [1]. These characteristics make the network teaching system and micro class can be well combined, using the network teaching system as the support platform of micro class. As a mode of blended learning, micro class integrates traditional classroom learning and online learning. The implementation of micro class

should be based on technical tools and information resources. So the network teaching system is used as the teaching platform of micro class. Through the network teaching system to provide learning support for micro class.

As an important professional basic course of business administration, financial management has not been taught online. The 21st century is an information and learning society. The Internet based distance learning will become a main way for people to learn. Therefore, it is necessary to carry out computer-aided instruction based on the Internet, give full play to the educational function of network, and reform the teaching methods. Therefore, a teaching system for financial management course integrated with online micro class was designed. The online teaching system of financial management course can not only provide students with distance learning, but also provide teachers with auxiliary teaching in the network classroom. It not only realizes the browsing of static web page, but also realizes the dynamic and interactive web page.

2 General Objectives and Principles of System Design

2.1 Overall Objective

The overall goal of this system design is to build a system platform suitable for multi course teaching for financial management micro course. As the basic platform for the implementation of financial management micro course, the network teaching system has the following functions:

- (1) Help teachers organize and present curriculum and teaching resources effectively. Classroom learning needs to provide teaching videos and other available learning resources [2].
- (2) Create a personalized learning environment. The system can record information about students' learning process, such as online learning time, practice right and wrong. So that teachers can quickly understand the students' learning situation and difficulties, and then can design effective teaching activities in the classroom can give students targeted guidance.
- (3) Create a collaborative environment for interaction and communication. The system can expand the interaction in the classroom to the network space, so as to increase the time and effect of teacher-student interaction. Relying on the network teaching system, students can easily establish a learning community and cooperate to complete the learning task.

2.2 System Design Principles

Students are the main body, teachers are the leading principle. Constructivist learning theory holds that learning is an active process of learning to construct knowledge. Therefore, when building the system platform, we need to design the system based on the roles of students and teachers, which reflects the dominant position of students' autonomous learning. At the same time, we should also emphasize the leading role of teachers in blended learning and the identity of organizers and instructors [3]. Teachers can better provide help for students' active learning and improve the efficiency of teaching.

Teachers guide and help the learning process by organizing learning materials, tutoring, answering questions and evaluating.

The principle of network openness. The system supports students and teachers to access the network system platform through a variety of network access ways, and also supports teachers and administrators to manage teaching through the Internet at any time and place with their user name and password.

Support a variety of teaching strategy principles. The micro teaching of financial management is different from the traditional classroom teaching of transmission and acceptance, and also different from the network course of completely autonomous learning. The development and design of network teaching system for financial management micro course should be able to reflect these new ideas and methods, and support exploratory and research-based learning, collaborative learning, debating learning, etc. The teaching system should not only support the teaching strategies of network learning, but also support the teaching strategies of class teaching, and provide the relevant tools to implement these teaching strategies [4].

The principle of user interaction. The system should be able to provide students with high-quality video, but also provide rich interaction. Students can know right and wrong in practice before class, and get tips and help in difficult situations. The teacher answers the students' difficult questions online, reviews the students' homework online and feeds back the results to the students.

The principle of simplicity is applied. The interface design should be clear and easy to operate. Because the use of the object is mainly by primary and secondary school students, especially primary school students, complex operation will affect their learning attention, even unable to continue learning. Through synchronous data access technology, reduce the client's access to the database, so that users feel convenient and fast in operation.

3 System Architecture Design

3.1 B/S Architecture

Before building the teaching system of financial management course, we must make clear the development architecture of the system, which determines the technology choice. The current development architecture includes B/s and C/S, and different types have different application scope. The system based on B/S is easy to maintain, and the system based on C/S mode needs to develop client, which is difficult to develop, but the advantage is stable performance. B/S structure is mainly through the network to achieve business processing, and the browser as the client, do not need to develop a separate client, while C/S structure is mainly applied in the LAN, need to develop an independent client, the workload is relatively large.

B/S structure and C/S structure have different application scope and characteristics

- (1) Compared with C/S structure, the application of B/S structure is more flexible, and the business processing is more convenient. For users, the system built under B/S structure is easier to use, and there is no need to install another client. You can directly use the browser to complete the business processing.

- (2) After the system based on B/S structure provides services through the network, any user can connect to the network for business processing without additional installation of clients, which can reduce the burden of users. Compared with B/S architecture, C/S architecture system is not without advantages, its processing speed is slow, and the stability is relatively high, can better manage the client. However, the defects are also obvious, the development costs and maintenance cost are relatively high, and the subsequent maintenance will cost more energy [5].

As for the financial management course teaching system integrated into online micro class, there is a perfect network environment inside the school. In the school, the content is processed through the LAN, while outside the school, users use the browser to process the teaching management business through the network. Based on the above characteristics, the teaching system of the financial management course is based on a B/S structure, which helps to improve the teaching quality of the school.

3.2 J2EE Platform

Java EE is a set of enterprise application platform specifications developed and launched by Sun company, full name: Java Platform Enterprise Edition, its previous version is called J2EE. It integrates web services, component models, management and communication APIs, and can help us quickly develop and deploy portable, robust, scalable and secure server-side Java applications. It is often used to implement enterprise level service-oriented architecture (SOA) and web applications. The typical Java EE specification defines four levels, namely customer layer, web layer, enterprise component EJB layer, and enterprise resource layer [6, 7].

- (1) Client layer: J2EE platform can be used to build the current mainstream application system based on B/S mode and C/S mode. The client layer is mainly used to develop the system of C/S mode. In order to build the system of C/S mode, the client layer of J2EE platform provides swing components.
- (2) Web layer: web layer is mainly used to build the system of B/S mode, which provides HTML and JSP technology. The web system built before usually needs to embed Java code in the HTML page. This mode is not only inefficient in development, but also difficult to maintain. Later, it is optimized and improved to separate the two, and the web layer focuses on accepting requests.
- (3) Business layer: the business layer is the core, which is mainly used to process various business requests. The technology used in this layer is Java. All business requests need to be processed by the business layer. After the processing, all the results have two directions. The first is to transmit to the web layer or the client layer for display, and the other is to store to the database. At present, there are many boxes in the business layer Shelf technology is used to improve efficiency, such as spring framework.
- (4) EIS layer: EIS layer is mainly used to store data and information, which supports the information system to use various types of databases, such as MySQL database and Oracle database.

3.3 Framework Design

This project adopts a typical B/S architecture to design, and uses J2EE multi-layer architecture design to realize online teaching system. In this way, the cohesion and integrity between modules are strengthened, the scalability and portability of the system are greatly improved, and the maintenance cost is reduced [8, 9]. In the web interface, Zhongwei users present an efficient, concise and good operation interface. The system architecture of the system is shown in Fig. 1.

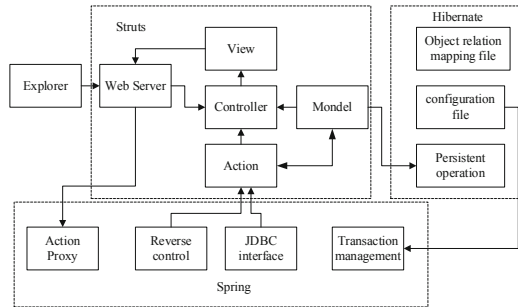


Fig. 1. System architecture chart

As can be seen from Fig. 1, the overall architecture of the system adopts struts as the framework basis, which is mainly responsible for the separation of model view controller. Hibernate provides persistence services, while spring is responsible for transaction processing and working logic. The whole design adopts the idea of object-oriented, according to the needs of the system to get the basic objects, and then make the corresponding Dao implementation for each object to achieve the function of accessing the database. Finally, spring completes the work logic and transaction processing.

4 SQL Server 2012 Database

SQL Server 2012 is a relational database management system management system (RDBMS) is designed and developed by Microsoft. Because of its powerful functionality, flexibility and rich application programming interface, it is deeply loved by free software lovers and commercial software developers, and has become one of the most popular relational database management systems [10, 11]. Benefited from its extremely sophisticated system structure and index design, the data is stored in different tables instead of centralized storage in a big data warehouse, which greatly improves the speed of data access and improves the flexibility. SQL Server 2012 database still uses the international standard query language (SQL for short), but it also provides many kinds of storage engines to support the application needs of different users. At present, it is divided into community version and commercial version. Because of its small size, faster speed, lower cost, especially its open source characteristics, it is widely used in the current Internet application development. Based on the above characteristics, this

topic chooses SQL Server 2012 database as the data storage platform of online teaching system.

SQL Server 2012 database has many advantages compared with other databases, as follows:

- (1) SQL Server 2012 database does not need high-performance server as support, although it consumes a small amount of memory, but its performance is outstanding.
- (2) SQL Server 2012 database has a good openness. At present, the widely used technologies can be used with SQL Server 2012 database to build the system, including C++, C # and J2EE.
- (3) SQL Server 2012 database has good compatibility and can be deployed in various operating systems for data storage.
- (4) SQL Server 2012 database client function is very powerful, easy to use, the system provides a perfect graphical interface and operation tips.
- (5) SQL Server 2012 database has high security, it can set access permissions for each independent database, so as to prevent other database administrators from viewing data directly.
- (6) Compared with Oracle, SQL Server 2012 is easier to install and has lower requirements on the installation environment, which can save the deployment cost.
- (7) SQL Server 2012 has a good interface design, easy to use, users can master the use of the database in a short time.

It can be seen from the above description that SQL Server 2012 has many characteristics which are consistent with the requirements of building a financial management course teaching system. Based on the above reasons, the financial management course teaching system integrated into online micro class uses SQL Server 2012 database to store teaching resource information and personnel information.

5 Functional Module Design

The financial management course teaching system integrated into online micro class includes comprehensive business process and detailed functions. According to the current situation, through the full investigation of teachers, students and various departments involved in teaching, the functional requirements are formed, including data entry, modification, query, generation and so on. The system provides a visual window with powerful data query function [12]. From a macro point of view, the financial teaching system is a set of classroom teaching, simulation training and teaching management functions as one of the teaching system.

5.1 System Setup Function Module

User login

The user login interface is mainly used to manage the basic information of the user, including the registration of the user and the login permission. For the users who have

no permission to log in, they need to register to get the permission to log in and use the system.

The interface consists of two text boxes and two buttons. The text box is used to input the user name and password. The user's identity information such as account number and password can be verified by comparing with the information accessed in the database. If it is correct, the information can be browsed and operated. If it is incorrect, that is to say, the system does not have the user information, you need to register the user. If the user name and password are verified successfully, you can directly enter the system for operation.

The key of the user login interface is to verify the user registration information such as user name and password. The modification function can be realized by calling the recorded information in the database to compare with the login information.

Password Management

The system provides the function of user password management. The password is saved in the binary file after a certain algorithm. Even if you use the software to edit the file, you can't find that the password module has no clear output. Therefore, you must verify the user's identity information before you can change the original password by clicking the change password button. In addition, if the user forgets the original password, the password can be retrieved through the password protection problem set when registering the user.

The password management interface is mainly used to modify and retrieve the password. The user can modify the password by changing the original saved information in the database through the change request.

System User Management

The system user management is to manage the user information and authority of the whole system. This function module can realize the operation of adding, deleting and modifying user information. At the same time, it can set the authority of corresponding users, and it can set different permissions of different subsystems.

- (1) Add: add a new user and add the permission of an existing user. This permission can only be completed by the system administrator.
- (2) Delete: delete the existing users and delete the permissions of the existing users. This permission can only be completed by the system administrator.
- (3) Modify: change the information of existing users and update the permissions of existing users. This update is operated according to the permissions of different users.

5.2 Teaching Function Modules

The teaching function of the system can improve the learning flexibility of financial management major, and teachers can make teaching plans according to the talent training plan before class. Through this function, teachers and students can interact in class, choose courses, exchange homework, upload and download courseware.

Teachers and students need to register before using the system, input the basic information, and complete the information, then the registration is successful. Each teacher and student has a unique number in the system, which is convenient for the administrator to manage. They can only use the unique identity and password to log in to the system. Teacher users can add, delete courses, set courses; query students who choose courses; teachers initiate classroom interaction, put forward discussion topics and reply to students' questions; teachers upload learning resources such as adding, deleting and querying courseware to view students' homework. Student users can enter the selected course learning, enter the teacher's classroom interactive topic, answer the teacher's questions, or ask the teacher for answers; students can query and download the courseware uploaded by the teacher; complete the homework.

(1) Classroom interaction

The system has the classroom interaction function between teachers and students. According to the psychological characteristics of students, it is convenient for students to put forward problems in time and effectively in the process of learning and interacting with teachers. It is conducive to teachers to find students' shortcomings in class and improve them. Teachers can initiate questions and manage them. Students can participate in them and submit their own opinions [13].

(2) Course selection

Teachers can use the system to add courses and manage them. They can modify and delete the courses. Students can get credits after completing the corresponding study by selecting courses, adding courses and learning.

(3) Homework exchange

Teachers can issue assignments and notices, students can browse assignments and notices, teachers and students, students and students communicate and discuss with each other and other intelligent management.

(4) Courseware upload and download

The teaching function provides teachers with the function of uploading and downloading courseware, and timely updating. Teachers can use corresponding resources in classroom teaching, such as classroom presentation slides. At the same time, teachers can also modify and delete the resource. Student users can only download, not add or delete.

5.3 Financial Management Practice Management Module

Financial management business training management module as the core of the system, mainly through the integration of real cases, with a listed company's three-year financial data as the background, combined with the brief introduction of the enterprise, the main production products, enterprise production capacity and market conditions, enterprise organizational structure, enterprise human resource status, corporate governance structure, enterprise financial personnel organizational structure, corporate governance structure, enterprise financial personnel organizational structure Risk response plan, enterprise accounting policies, guidelines, financial system and three years of various financial statements, so that students can carry out "on-site financial management" according to these detailed information.

- (1) Financial environment: it mainly realizes the setting of financial environment in different situations, makes users familiar with the financial environment, and provides the basis for subsequent decision-making according to the financial environment.
- (2) Financial analysis: it mainly realizes the function of analyzing all kinds of report data, including balance sheet analysis, income statement analysis and cash flow statement analysis, and provides analysis models of other indicators.
- (3) Financial forecast in planning period: according to the enterprise background and report data, make long-term financial budget for the enterprise through specific analysis and decision-making.
- (4) Fund raising management: according to various background information of the enterprise, it can reasonably determine the fund gap, formulate dividend policy, and finally determine the capital demand. Combined with current asset management and enterprise working capital raising policy, it can analyze various capital costs and advantages and disadvantages of short-term and long-term financing channels, and finally give the most appropriate financing decision of the enterprise.
- (5) Project investment management: according to the enterprise financial objectives and fund-raising situation, put forward a number of project investment plans, and carefully analyze the plans, and finally make decisions.

5.4 Information Management Function

Through the system, teaching administrators can master college information, professional information, teacher information, class information, student information, achievement information, news information, etc. Assist the school teaching development center and each professional teaching and research section to formulate the corresponding teaching plan to meet the basic business work.

- (1) College Information Management
Administrators can add college information and manage it. Establish the information of each college, with a unique number for each college, and add the college name, establishment date, Dean's name, contact number, etc. To facilitate future queries, in the college information management, you can query the corresponding college information. Only administrators can add, modify and delete college information. Teachers and students can only join the selected college.
- (2) Professional information management
Administrators can add professional information and manage it. Establish the information of each specialty, and add each specialty number, specialty name, college, establishment date, contact person, contact number, etc. In the specialty information management, you can query and filter the corresponding specialty information. Only administrators have the authority to add, modify and delete professional information. Teachers and students can only join the selected professional learning.
- (3) Teacher information management
Administrators can add teacher information and manage it. Establish the electronic file of each teacher, and add teacher information: name, gender, date of birth and other basic information. Each teacher has a unique number. Only administrators can add, modify and delete teacher information.

- (4) **Class information management**
Administrators can add class information and manage class information. Establish the information of each class, and add each class number, class name, major, establishment date, head teacher, contact number, etc.; administrators and teachers can add, modify and delete class information, and students can join the class for learning.
- (5) **Student information management**
Administrators can add student information and manage it. Establish the electronic file of each student, and add the student's number, name, gender, class, date of birth and other basic information; administrators and teachers can add, modify and delete the student's information, and train the students in groups.
- (6) **Achievement information management**

The administrator can add and manage the score information. Add student's grade information, student's name, course grade score and evaluation, etc.; administrators and teachers can add, modify and delete grade information to query and filter student's grade information.

6 System Testing and Analysis

System testing is an essential part in the process of system development. After the completion of the system design, before it is put into use, it needs to carry out system testing. Through repeated system testing and system modification, the final design of the system is completed.

The purpose of system testing is to find the deficiencies of the system and verify whether the system meets the initial requirements analysis. After finding out the shortcomings of the system, they modify it, then continue to test the system, test and modify it repeatedly, and finally improve the system to meet the needs of users. The quality and stability of the teaching platform of financial management course depend on the design and implementation of the system. Whether the designed system is easy for students to learn,

To be able to facilitate the use of teachers in teaching, these are issues to be considered. Therefore, in the testing stage, we should focus on these aspects of testing, to improve.

6.1 System Operating Environment

(1) Server:

- Minimum hardware requirements
CPU: PIII 450.
Memory: 256M.
Hard disk space: 500M.
 - Software requirements
Operating system: Windows 2000 Server.
Web Service: IIS 5.0
Database: MS SQL Server 7.0
- (2) Client:

- Minimum hardware requirements
CPU: P166.
Memory: 64M.
Hard disk space: 100M.
- Software requirements
Operating system: Windows 95 / 98 / NT / 2000.
Browser: ie 4.0 or above.

6.2 System Test Topology

The system test topology is shown in Fig. 2.

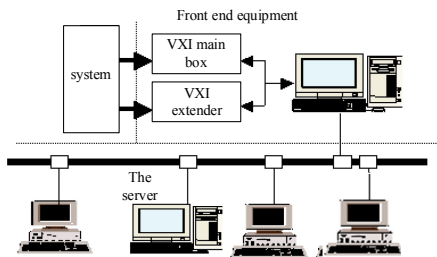


Fig. 2. Topology of System Test

6.3 Test Methods

Function testing is mainly manual testing. First of all, we need to analyze the functional requirements of online teaching systems, and build test cases according to the functional characteristics. In the test stage, there are different test methods. This paper uses the black box test method. The advantage of black box test method is that it doesn't need to understand the internal logic of the function, just need to know whether the input data can get the corresponding results. This test method is simple and effective.

Performance testing can not be handled manually, so we must borrow performance testing tools to simulate user operating system in order to complete performance testing. Especially when simulating large-scale users for stress testing, the method of increasing the number of concurrent users can be adopted until the performance target is achieved. In the performance test, we need to focus on the response speed of the system, CPU utilization, in order to get the final test results.

6.4 Functional Test Results

The information management function module is selected for the function test, and the function test results are shown in Table 1.

It can be seen from Table 1 that the expected results of the function are met.

Table 1. Test results

Test title	Educational administration	Test results	Are the expected results met
Participation roles	Administrators and teachers	The database successfully saved the information results after the operation	Yes
Test object	Educational administration page	The database successfully saved the results of each operation	Yes
Testing procedure	Enter the teacher management page to add, delete and modify the teacher information	The database successfully saved the results of each operation	Yes
	Enter the administrative class management page to create, delete and modify the administrative class	The database successfully saved the results of each operation	Yes
	Enter the teaching class management page to create, delete and modify the administrative class	Successfully added an exam to the database	Yes
	Enter the test management page to add, delete and modify the test	The parameters of the system have been changed successfully	Yes
	Enter the examination management page and add an examination	Test results	Yes
	Enter the system parameter setting page to add basic system parameters	The database successfully saved the information results after the operation	Yes

6.5 Performance Testing

In the process of testing, LoadRunner software is mainly used for simulation testing. According to the performance requirements, it needs to meet 500 users to complete concurrent access within 3S. The test results are shown in Table 2.

It can be seen from Table 2 that 500 users have completed concurrent access within 3S, meeting the system performance requirements.

Table 2. System performance test results table

User	Response time (s)
50	1.34
100	1.44
200	1.54
250	1.54
300	1.58
350	1.72
400	1.97
450	2.10
500	2.34

7 Conclusion

In the traditional teaching method of financial management course, there are some problems that students have difficulty understanding some principles and concepts at the beginning stage, which leads to the problems of poor learning effect and insufficient practice time under the premise of setting the total class time. Therefore, this paper introduces the micro-course into the financial management course teaching system, makes the students' learning process more colorful, realizes the multimedia, information, interactive and efficient teaching of financial management, makes the financial management teaching process more interesting and vivid, increases the students' fun in the learning process, promotes the teacher's teaching, and improves the classroom quality. The next step is to apply this system to more types of courses to further improve and optimize the existing system.

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