ABSTRACT: This paper constructs a teaching resources sharing platform based on campus network, which has integrated the existing digital teaching resources, and collected the scattered resources together and improved the whole unreasonable resources layout, repetitive construction and so on. Since the network is convenient and real-time, it is suited to be applied to the traditional classroom teaching. The teaching resources share platform can not only help students to make full use of information technology tools for the realization of personalized learning, but also can strengthen the learning interests and enthusiasms of the students.

Categories and Subject Descriptors
C.2 [Computer-Communication Networks]: Data communications; K.3.1 [Computer Uses in Education]

General Terms
Learning Network, Digital Learning, Network Sharing

Keywords: Teaching Resources, Campus Network, Sharing Platform

Received: 19 June 2011, Revised 27 August 2011, Accepted 6 September 2011

1. Introduction

With the rapid development of information technology, digital campus construction continues to move forward. The construction of teaching resources sharing platform in vocational institutions plays a decisive role in major construction and curriculum reform. The high-quality teaching resources sharing is the only way [1] for education innovation, education reform and quality engineering. On the one hand, it is helpful for alleviating the contradiction between the teaching resources supply and demand, and decreasing the imbalance in the distribution of China’s higher education resources to promote equity in education. The sharing of resources contributes to solve the problems of long development cycle, professional limitation, irrational distribution of overall resources, duplication and other issues, as well as improve the utilization rate of resources. Meanwhile, high-quality teaching resources sharing are beneficial to enhance students’ interests in learning, thus improving the learning effects, and promote the idea of lifelong learning.

2. Design Principles of Teaching Resources Sharing Platform

The integration of teaching resources should adhere to minimal changes in the existing system architecture, thus to ensure that the normal operation of the original system can be still working and the initial investment will not be wasted. Therefore, it can also reduce the workload of the integration of teaching resources [2].

1) To adopt the unified resources search engine, and develop the platform based on the knowledge engine. The built-in search engine of platform is a powerful, widely applicable resources intelligent processing system, which can provide cross-platform [3], cross-format, cross-language resources search and can be integrated among the database, Internet, Intranet and Extranet.

2) The principles are easy to deploy, easy to run and use [4]. The enterprise-level platform architecture is a three-tier architecture, namely B/S/S structure. The server includes web server, web-based education resources management application server and database. And the foreground is a browser. It is suitable for single or multiple server structure. Distribution settings and cluster settings have been chosen to enable optimal scalability and response. It is easy to manage and use because the client only need a browser.

3. Teaching Resources Sharing Platform Design

3.1 The Architecture Design of Teaching Resources Sharing Platform

Based on the Web distributed multi-layer architecture, digital teaching resources sharing service platform consists of four layers.

1) Bottom. To establish an information resources database (multi-media resources library, courseware library, document library, article libraries, etc.) on the basis of the underlying platform and hardware facilities, Meanwhile, to establish the necessary .NET platform and the web server.
2) Intermediate service layer. On the basis of the bottom, implement user administration, access control, information resources management, platform configuration management, information resources search engine, and the effectively integrated FTP and mail service should also be established.

3) Application layer. Application layer provides the video-based on-demand service, customization, push service (information subscription), information exchange service, resources browsing service, resources retrieval service to users based on the intermediate service layer [5].

4) Presentation layer. Users can use the media player, IE/Chrome and other client tools to browse and the platform services.

4. Teaching Resources Development System
The teachers are creators and users of the teaching resources. If the teachers were provided with simple tools for efficient resources production, it would undoubtedly arouse their enthusiasm and reduce duplication of the labor intensity. Teaching resources development system has the following modules.

1) Teaching resources library: each major as a unit, to provide a complete multiple sub-libraries, users can choose whether to establish new libraries.

2) Resources upload: users can upload resources via the network at anytime and anywhere. The system administrator is able to achieve bulk upload by the application program.

3) Resources audit: the administrator who has the audit authority reviews the resources uploaded by teachers according to the resources evaluation criteria, and then determines whether to release the resources.

4) Resources retrieval: providing multi-dimensional full-text search resources function of resources library for users.

5) Delete resources: resources auditor or system administrator can delete the resources which do not meet the criteria or the expired ones.

6) Resources Collection: Users can add their favorite resources to individual folders for quick location.

This system provides resources production template and template making tools to meet the needs of teaching resources development, it reduces technical barriers [6], builds convenient on-line teaching resources making tools, and then teachers can get rid of the difficulties of adaptation technologies. The function structure is shown in Figure 1.

4.1 Internships and Training Simulation of the Teaching System
In order to improve students’ practical ability and their employment competitiveness, we must follow the basic rules of professional skills training and demands of the actual society on vocational skills, and integrate simulation system resources of each major selectively based on the job characteristics. Therefore, students will not only have theoretical knowledge, but also skills. Then, they will be able to meet the job requirements of advanced technology-based business professionals. Internships and training simulation teaching system is divided into the following three specific functional modules [7].

1) Internships and training simulation: providing internships and training simulation software library which implemented by computer technology. Users can directly train their skills in the simulated environment.

2) Internships booking: establishing the inside and outside school internships and training base cooperative unit online resources library. Then, users can contact with internship and training base or enterprise to book internships, and consult specific issues via network according to their own needs.

3) Internships and training quality assessment: providing registered students with series of human resources quality control evaluation services, which include course learning assessment since enrollment, social practice, enterprise working experience, certificate, internship evaluation, employment recommendation, employers’ evaluation, job tracking, etc.

4.2 Major and curriculum development system
The major and curriculum development system has followed the “vocational model school” construction requirements which proposed by the Ministry of Education, the system constructs, manages and demonstrates the related courses from the major construction level. The
system structure is shown in figure 2.

![Diagram of major and curriculum development system]

Figure 2. The function structure of major and curriculum development system

The core system is the major and curriculum construction, the users’ role have been designed as system administrator, teaching observer, teacher, student, and visitor, these users have been provided to:

1) System administrator: Faculty management (major maintenance, open settings, establish training plan), course management (course maintenance), teacher maintenance, teaching column setting, user management, and information distribution management.

2) Teaching observer: browse the overall faculties, majors, training programs, curriculums and teachers arrangement, teaching masters, honor courses and teaching column, and the teaching situation can be seen in network teaching platform.

3) Teacher/student: browse the faculties, majors, training programs, courses and teachers arrangement, teaching masters, honor courses and teaching column, and the teachers can manage the teaching courses, and students can manage the learning courses at the same time.

4) Visitor: browse the faculties, majors, training programs, arrangement of courses and teachers, teaching masters, honor courses and teaching column.

4.3 Innovative Teaching System

The innovative teaching system is one of the teaching models for students’ high-level learning ability, communication ability and collaboration ability training. In the innovative teaching, the students determine the research topics from the nature, society and life, and acquire knowledge, apply knowledge to solve problems in the course of research under the guidance of teachers.

The design goal of collaborative activities oriented innovative teaching system is building a network learning environment which supports various teaching modes. In this environment, teachers and teaching designers are able to configure the network learning environment for supporting some teaching modes or strategies based on different teaching modes and strategies, among which provide the operational ideas, methods and tools from teaching theories, teaching modes and teaching strategies to actual network teaching design. The structure of innovative teaching system is shown in figure 3.

The collaborative activities oriented innovative teaching system can help the teachers to develop the high-level learning ability, communication ability and collaboration ability by group collaborative teaching activities. Meanwhile, it supports the teaching segments of issue location, literature review, comprehensive analysis, communication, collaboration, report presented, effect evaluation, etc.

The main functions of the system are teaching circumstances creation, teaching grouping, issue analysis, research approach drafting, research resources sharing, issues discussion, collaboration, research results presenting, teaching evaluation, teaching assistance, teaching guidance and teaching management.

4.4 Teaching Resources Sharing Management System

In order to improve the organization and availability of existing resources, and to achieve a large number of scattered teaching resources sharing, we need to build a teaching resources sharing management system based on campus network. The system can automatically complete the majority work of resources storage [8], and improve the utilization efficiency of resources. It can support various classification methods and intelligent automatic classification, automatically reading resources properties, automatically generating preview files, automatically storing resources, and automatic resources quality evaluation, as shown in figure 4.

In order to reconstruct or exchange resources data between different types of libraries, the data structure of system based on XML data exchange format [9], the normal form of education resources are bound through the XML of resources attributes, and then the system will:

1) Achieve the resources content-based directional retrieval, and improve the teaching resources searching efficiency on the internet.
2) Provide a consistent underlying data structure as the standard interfaces for data exchanging between different systems.

3) Provide the possibility for the various processing methods of teaching resources and its manifestation

4) Provide the possibility for establishing professional, self-expandable open teaching resources library.

5) Provide the basis for automatic classification of teaching resources.

5. Conclusion

This paper builds a teaching resources sharing platform based on campus network. The platform has implemented high quality teaching resources sharing and spreading by using multi-media and network technology, and it also has combined traditional education methods with modern network teaching methods organically. Thereby, students can be more active, collaborative, and research-based learning. Moreover, their information literacy, capacity of innovation and problem solving can be trained [10]. The platform improves the level of major courses teaching, provides a good basis for improving the quality of graduate design, curriculum design, production internships and other practical teaching aspects, and it is the exploration for teaching model reform.

6. Acknowledgements

The authors thank editor-in-chief and anonymous reviewers for their comments and suggestions. The work is supported by the Education department of Zhejiang Province (NO.JA025).

References


