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The Design and Implementation of Mutual-Help Teaching System Based on Multimedia Network

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Abstract

With the continuous increase in broadband users of China, the development of information, whose core is the Internet technology, laid a solid foundation for the implementation of in China. Network teaching, as a supplementary means inside and outside class, is increasingly being favored by the popular majority. In order to meet the new era of distance education, we need to develop a network teaching system, which allows the problems raised by users to be resolved quickly on this system. The communication system, including network teaching inside and outside the school, will be established and used in many fields, such as course development, online examination, homework management and teaching resource management.

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Keywords: Network Teaching; Communication; Interaction; Multimedia Technology

1. Introduction

The increasing popularity of the Internet provide applications such as optimum technical systems, integrated communications, e-mail and interactive Web, which build a solid foundation for constructing network teaching systems [1-2]. Education should be oriented toward modernization, the world and the future [3]. Utilizing the Internet for remote online education is the optimum medium and valid approach to achieve this goal [4].

2. The current status of teaching platform

Although the development of modern education has entered a boom period, but in the realization of network-assisted teaching, there are still some prominent issues [5].

- (1) Contents are rigid and less interactive.
- (2) Can not meet the requirements of classroom assistance.
- (3) The lack of appropriate theoretic direction for practice.
- (4) The lack of good information feedback system.
- (5) The lack of a high-efficiency guidance mechanism.
- (6) The lack of the monitoring to learning process and the function of system in test and evaluation is not powerful.

3. System requirements and system function analysis

3.1. Analysis of network teaching system

Utilizing computers to carry out network teaching is a useful supplement for the traditional teaching [6]. The teaching objectives of this system requires students to take full advantage of the manifestation mode and characteristics of computer multimedia, and carry out the full range of mutual help between teachers and students, including communications of one-to-one and one-to-many, text communication and multimedia communication.

Through the above analysis, the overall system requirements could be derived as follows.

- (1) The system could administrate system users, for example modifying the related information of users.
- (2) The system provides different ways of the mutual help, which meet the needs of different users.
- (3) Within different ways, different manifestation modes of multimedia information are provided.
- (4) The system can meet the communication requirement of different users, online or off-line communications.
- (5) Individual and collective discussion could be reflected in the mutual help.

3.2. Analysis on the overall function of the system

In the functional requirements, the needs of curricular and extra-curricular users should be mainly taken into account. First, teachers conduct the rationalized design using network system in the teaching, aiming at needs of themselves and students. Teachers rationally manage resources, release resources and reply messages according to self-requirement, thus the teaching information could be orderly transferred, which could be resolved through a variety of ways of the mutual help.

Second, students get and distribute the information using network system in learning, aiming at needs of themselves and teachers. Students rationally download resources, search resources and request for help, thus the learning information could be orderly transferred, which could be resolved by selecting a best mode of mutual help.

4. The design of the mutual-help teaching system based on multimedia network

After researching the requirements for multimedia network teaching, we have deeper understanding on the network teaching system, which focuses on the mutual help and is based on multimedia technology. The system adopts the B/S structure mode, i.e. the system was run on the server, and the client exchanges the information using the browser through the network.

4.1. The design of teacher login

During designing the function, taking into account the needs of students to solve questions and teachers to answer questions, the following functions were mainly designed here, such as designing the message reply to realize the text communication one by one, designing the discussion to realize the one-to-many communication. When students need teaching materials, teachers can upload resources. After the review by administrator, resources will be shared, which facilitate teachers and students to search and download.

4.2. The design of displaying user data

The user's basic information is mainly displayed. Following data were added by super administrator, such as the identify number of teachers, telephone number, name, E-mail, gender, MSN, College, QQ, major and personal profile. These data were set primarily for the convenience to exchange information. Users can upload their own photos, which guarantee the submitted information is completely reliable.

4.3. The design of administrator login

During designing the administrator function, the administrator possesses the power such as replying message, participating discussions, uploading resources, examining resources and managing student, teacher, college, major, course, user, type and resource. As the unique resource reviewer, the administrator will examine the type and content of resources, to ensure they are real and effective. For adding teachers and students, the administrator set the username and password according to the actual situation, and only allows users to change the password. The major, course and college will be added according to the teaching requirements. Managing type refer to classifying the type of resources.

4.4. The design of student login

In the student module, in general, students need only two functions. One is downloading the necessary resources, i.e., through the search function within the system, students could find resources in time to solve their problems. In addition, when students can not solve the problem, they could obtain the timely and effective communication. Using “my message”, teaching materials can be communicated one to one, which ensure the individualized counseling. For the universal problems raised, the information can also be released one to many through the module of discussion and communication, which could save the system space and speed up the solution time.

4.5. The design of mutual help

In the network teaching system, in order to transfer knowledge more efficiently and orderly, mutual help is very important. As show in Fig. 1, for the ways of mutual help, there are text-based help, image-based help, animation-based help and video-based help so on. During the help process, the goal can be achieved through a simple way, not a complicated one.

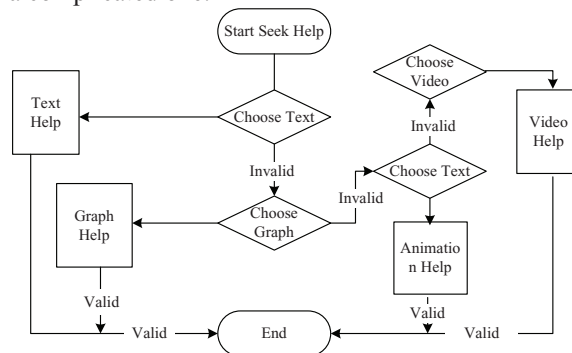


Fig. 1 The process of mutual help

5. The realization of the mutual-help teaching system based on multimedia network

5.1. The realization of system login

The home page for accessing system is index.asp, the login window at the right hand side is for the person inside the system. In the management inside the teaching, using the Microsoft 2000 SQL Server

technology, three kinds of users, i.e., administrators, teachers and students authenticate login through accessing the data sheet in the database TEACHING_Data.MDF. The inside mutual-help mainly implement transferring messages one to one and releasing posts on to many. Transferring messages one to one employs the transferring mode similar to E-mail, but is faster than E-mail, which was shown in Fig. 2. Releasing posts adopt the BBS mode.

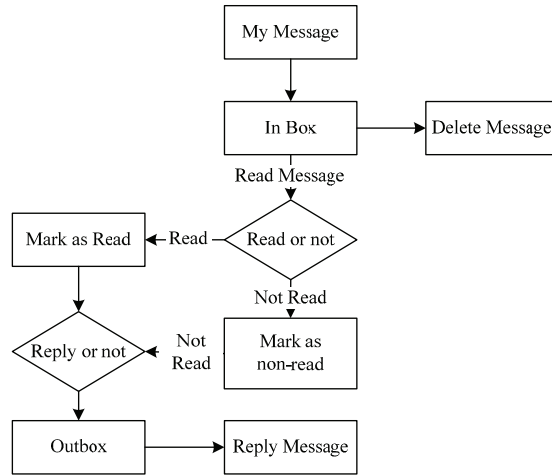


Fig. 2 The flow chart of replying message

5.2. The realization of user login

The login module is the unified entrance of system. The identification of teachers is completed in this section, as shown in Fig. 3. The teachers belong to this network teaching platform should be added by the administrator before using it. If users have existed in the system, they can login by entering the correct username and password at the appropriate place in the login form, then clicking the "Login" button. After successful login, the username will be stored in the phase variable “username”, and this variable can pass the login username to other pages.

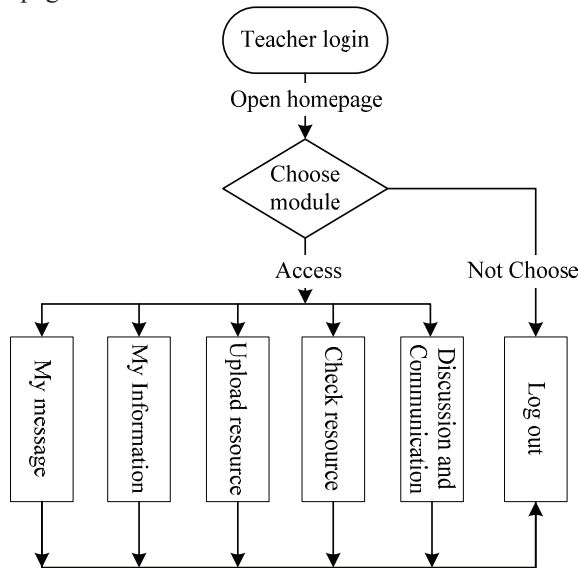


Fig. 3 The flow chart of teacher login

Students can not access the information inside the system through register mode. They should be added by administrators inside the system, then access the database TEACHING_Data.MDF using SQL, finally obtain system privileges through validation, as shown in Fig. 4. The administrator manages personnel and resources of the whole system, as shown in Fig. 5.

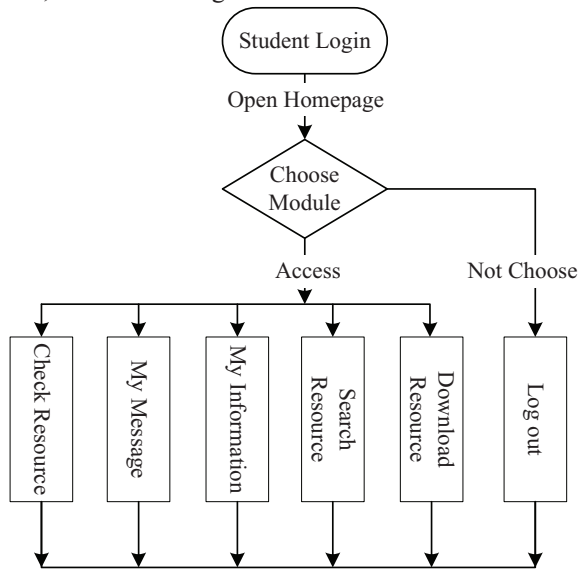


Fig. 4 The flow chart of student login

6. The release and running test of network teaching system

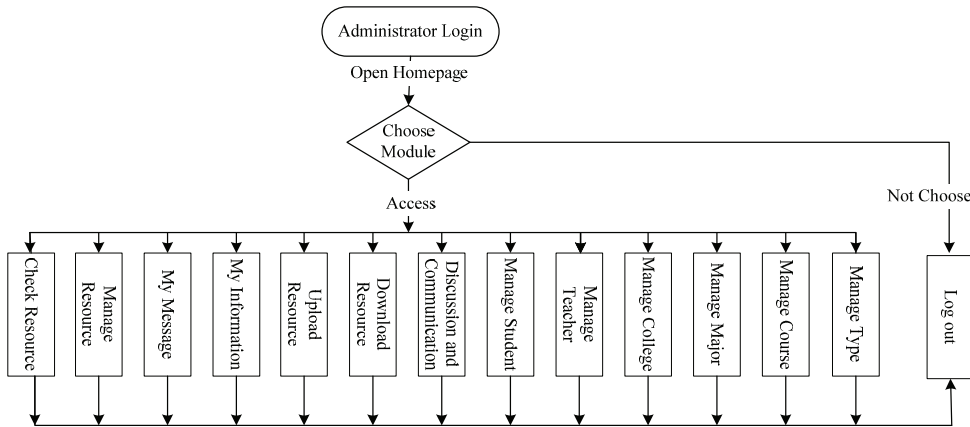


Fig. 5 The flow chart of administrator login

6.1. The running environment of the system

The system uses the B/S mode. As for the design and operation, using a single server for service is relatively simple and convenient for testing and maintenance.

System configuration: (1) Operating system of the server: Windows 2000 or XP; (2) Operating system of the client: Windows XP Professional; (3) Database management software: Microsoft SQL Server 2000; (4) Other software required for running system: IE or other web browser must be installed in the client.

6.2. The running of the network teaching system

When the construction of the network teaching system is completed, web pages is released using IIS, and database management is implemented using Microsoft sql server 2000.

Conclusion

This article is based on collecting and reviewing the construction situation of related teaching systems at home and abroad. According to China's national conditions, combined with our technological superiority in multimedia technology, the featured mutual help was researched and developed.

Based on the requirement of problem-based learning (PBL), we proposed that the mutual help should adopt various ways to meet different types of users. For users of the system, any kind of ways was selected to conduct the communication, which abandons the past problem such as single communication and poor exchange of information.

Through the mutual-help teaching system based on multimedia network, the work which can not be completed in teaching could be realized, and the problem of users could be solved as soon as possible through a variety of suitable communication ways.

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