The Design and Development of Intelligent Multimedia

Network CAI Courseware

Guangran Liu[*]   *Hong Yin*[**]   *Tianjin Vocational Technical Teachers' College*

Abstract: Currently, the intelligence and individuality of multimedia network courseware is not enough, which limits the universal development of modern long-distance education. It is the best way to develop network courseware with intelligence. The paper basing on "College English" introduces the idea of design, system structure and development of process.

Key words: intelligence; multimedia; network; courseware; teaching

1. Introduction

With the development of the technology of multimedia and network, the modern long-distance education website basing on web grows up rapidly, all kinds of courseware appear largely. But as far as most web courseware concerned have several faults.

The expression of teaching content is static basically. That is to say, the content of learning which is expressed in static HTML is published on website. When they are put on website, they are hardly modified. On one hand, the designers don't know if their designs are reasonable. On the other hand the students learn the teaching content according to the pre-design order, and they will lose the interest in learning easily. In most modern teaching education website, different students face 90% uniform teaching environment, the same title, navigator, background and advertisement. The same teaching environment can not provide the learning custom and learning schedule according to each student, and can not take full advantage of individuality either.

The education website provides the function of online test facing to student. They use to test the learning effect, but the result of test has not combined with the further learning. They do not provide the instruction and suggestion. They have not enough management to monitor the learning process.

In general, the network multimedia courseware has deficiencies in the intelligence and individuality, it limits the universal development of modern long-distance education. It is the best way to develop the network courseware with intelligence. The paper basing on "College English" introduces the development process of intelligent multimedia network courseware.

2. The System Design of Intelligent Multimedia Network Courseware

2.1 The Design Idea of Intelligent Courseware

It bases on the theory of CAI and the principle which centers on students, and the students according to their

[*] Guangran Liu, Educational Master, associate professor at Department of Computer, Tianjin Vocational Technical Teachers' College; Research Field: computer application; Address: Department of Computer, Tianjin Vocational Technical Teachers' College, Tianjin, P.R.China; Postcode: 300222.
[**] Hong Yin, Department of Computer, Tianjin Vocational Technical Teachers' College; Address: Department of Computer, Tianjin Vocational Technical Teachers' College, Tianjin, P.R.China; Postcode: 300222.

abilities design the intelligent multimedia network courseware of college English. The intelligence of courseware expresses in several respects as follow:

(1) The design of learning environment

When user registers, the courseware system puts question to user to get the user's demand of learning environment. For example, the information of teaching content where it displays on website, etc. The user's demand is recorded in personal information document, when learning, the system have the learning environment custom made according to user demand.

(2) Individuality teaching strategy

The courseware system can automatically provide the adaptable teaching strategy according to the learning ability and comprehension ability and grasping knowledge of user. Therefore the user learns in the teaching environment which adapts to personal learning ability. With further learning of user, the ability of user will be prompted continually. The old learning strategy cannot be adapted to the user's learning. The new courseware system will test the learning effect of user timely and inspect the change of learning ability of user and change the learning strategy for the user's learning.

(3) Comprehensive review target

The courseware combines absolute review and relative review. It comprehensively reviews the learning effect of student in order to review the learning aim of student according to the difficulty degree and accuracy rate and time used to test and time the user's learning, etc.

(4) The learning content regulated by self-determination

When the student is not satisfied with the learning content in the process of learning, they may put forward application to regulate the learning content by self-determination. For example, they may select fast listening speed and saga fairy-tale, etc.

(5) Taking full advantages of multimedia

The old courseware mainly consists of characters, sound video and so on, that are only supplements. In the system, the sound, video and characters are all the same important for improving English level overall. Such as the abilities of reading, listening and speaking. The system records and replays the pronunciation of student in order that the student can listen their deficiencies and correct them by practicing again and again, till their pronunciations are correct.

2.2 The Design of System Structure

The structure design of intelligent multimedia network CAI courseware basing on college English is presented as Figure 1.
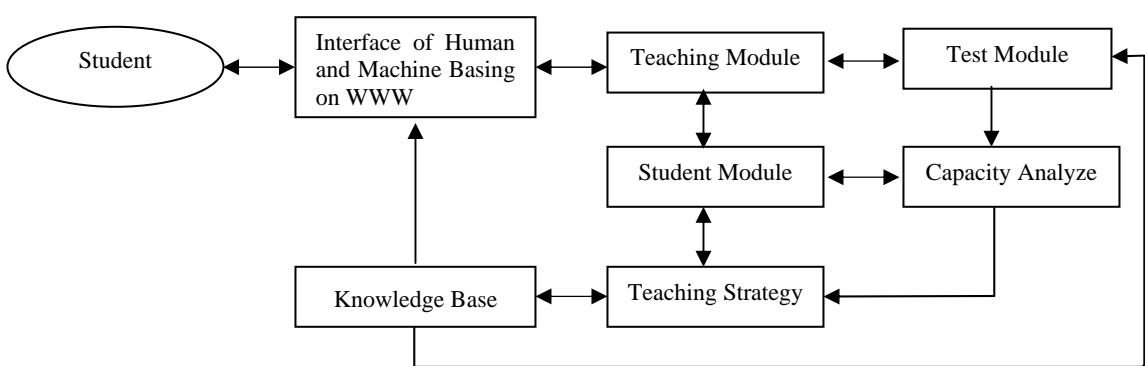

Figure 1   System Structure of "College English" Intelligent Multimedia Web CAI Courseware

(1) Interface of human and machine basing on www

The interface provides web browser which the student is familiar with currently.

(2) Student module

The student module records the information knowledge level and learning ability of student, etc. It services to establish learning strategy. The information includes personal achievement, learning record, personal character, deficiency in ability and further learning strategy.

(3) Teaching strategy

The module generates student's learning strategy according to ability, learning schedule and learning demand and etc which the student module provides.

(4) Teaching module

The module gets knowledge information from library to teach and record problem from teaching according to the strategy which teaching strategy model provides. The module refers to teaching module.

(5) Test module

The module bases on knowledge base, and test basic knowledge and the mastery extent of ability training of student and the learning effect of student overall. It stores the result of test to provide reference for the teaching strategy module.

(6) Ability analysis module

The module bases on ability analyze repository and the character of ability of student and records the result of analysis in the student module. At the same time, it feeds and suggests the student which aspects have tube intensified.

(7) Knowledge base

The knowledge base not only stores teaching courseware, but also stores regulations where teaching strategy generates. The information includes basic knowledge base, ability base, testing base, opinions base, strategy base, ability analysis base, record base, problem base, etc.

2.3 Development /Running Environment

The courseware system adapts three tiers-Browser/Server structure, the illustration as Figure 2.

Figure 2   Sketch Map about B/S Structure

The running environment of system takes windows 2000 as web server. The server adopts IIS which supports ASP. The database server adopts Microsoft SQL7.0. The client browser operating system is windows 9x. The browser is IE5.0 or above.

The connection of web server and database server adopts CGI which is programmed in VB. The reason that CGI is not programmed in ASP or JSP is that the teaching environment of the courseware is dynamically generated according to the learning information of each user, including the learning content, the further learning content, the state of current learning, the demand of current learning environment and the Teaching module, Student Module, Test Module, Capacity Analyze Teaching strategy, Knowledge base, Interface of human and machine basing on www, Student Client browser, Web Server Database server, Page request, Page Acknowledge Information, request Information, return demand of changing the learning content, etc. In addition, the VB (Visual

Basic) has an external module, which may generate web page dynamically in order to develop program conveniently.

3. The Courseware Development

3.1 The Organization of Information Database

The information data in the system is classified in .ini file, .txt file and database file. The .ini file stores the current learning information and the statistics of learning information of user, including the learning content, learning record, learning demand and learning strategy, etc. The concrete content structure includes the item of test, listening, reading, writing, learning record and learning environment, etc. The items of learning environment includes concrete information of self-determination, background color, font color, user model, text position, word position, reading position, practice position, model shape, etc. They are used to determine the concrete learning environment of student.

The text file stores resource information of courseware, including text, word, reading material, test repository, etc. The information takes course as unit. It stores the text, word, reading material, testing repository into the text file respectively.

The database file stores relatively steady information, which is mainly the position of learning content of user in text.

In the process of realizing courseware, first we will read the initial information from the ini. File, second we will read database file and look for the position of teaching content, finally we will look up the txt file and read teaching content and the web page for user to learn.

3.2 The Realization of Learning Environment Which is Different from Personality

We adopt two ways to realize learning environment, one is provides some model for user to select, the other is makes user select and realize what contents in which position. The two ways record learning environment information into personal file. The concrete information includes the item of learning environment in the .ini file structure.

What technology does the courseware use to generate web page? It takes use of HTML. First, it takes use of html for every model and every position to program the according web page and store the according text file. Second, it will read the position of file model from personal ini file and make use of the sending function provided by the external module and send every sentence to web page the concrete code as follows:

```
If sal.RecordCount <> 0 Then
startnum = sal("start line")
endnum = sal("end line")
filenum = FreeFile()
Open s For Input As filenum
For j = startnum To endnum
Line Input #filenum, f
Send f
Send "<br>"
Next j
```

Here, the sending function is called win32AP writing file and send string to web page.

3.3 The Realization of Dynamic Learning Strategy

The realization of dynamic learning strategy mainly relies on the strategy file of user in database. The determination of the according record of strategy file has two ways. One is that the student applied learning content to the system by providing opinion sheet according to personal interest. The other is that the record automatically determines the grade of user according to the testing level of student.

3.4 The Realization of Comprehensive Review

In usual testing review, the system reviews the learning state of student according to the test accuracy of student. The result of review is one-sided and unfair to determine the learning effect is not only from one-side testing, but also from several respects to review comprehensively. Such as ,the learning time of student, the difficulty of test, the time of test, the accuracy of test, the difficulty of learning and other overall factors. The system reaches a conclusion of review when testing the courseware. It insures the fair of test by several records and the principal of comprehensive analysis.

When the user finish the learning of a course, the courseware system will generate a paper which accords with the difficulty of learning of user. After the system scores, it will look up the review of the learning effect according to the score in the suggestion material base of courseware system. The system scores by individual event, that is to say, the system will review the learning effect individually for every item of user and help users improve their learning method.

4. Conclusion

The intelligent multimedia network courseware basing on college English has been forward initially. It is an initial form because the current courseware only provides the teaching content of courses. The next emphasis is the one is riched in teaching content and that is to complete the teaching strategy. The other is to introduce voice recognition into courseware to improve the degree of intelligence of courseware.

References:

1. Guangran Liu. (2002). *The Design and "College English" Intelligent Courseware*. Journal of Tianjin Normal University, (5)

2. Jiyun Li. (2002). *The Design and Realization of Optical & Intelligent CAI Courseware.* Journal of Dongbei University, (10)

3. Lili Mao. (2002). *Design and Realization of the E-Commerce Teaching Simulation System*. Proceeding of the 6th GCCCE2002, (6)

(Edited by Jian Feng, Saihu Xu and Shan Chen)