

## Development of Computer English Education Platform Based on B / S Model

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**Abstract**—This paper expounds the significance of English online education platform for college students' autonomous learning in English, and analyzes the function and characteristics of English online self-learning platform based on B / S architecture. On this basis, the English web-based learning platform was analyzed and designed, with the display of corresponding flow chart and model creation. Then, we designed the platform modules and their test use models. Under the principle of software engineering, we conducted a series of tests on the well-completed online English self-learning platform. The major test uses and test results were displayed accordingly. Finally, with a systematic analysis of the test results, we verified the effectiveness of our tests.

**Keywords**—B / S architecture, English education platform, computer English, computer-aided teaching

### 1 Introduction

The Chinese studies on English online self-learning has underwent several stages of development, accumulating numerous research findings. The early-stage research objects included training of grammatical knowledge, reading skills and writing skills; later on, specific training of reading, listening and speaking abilities gained scholastic popularity; nowadays, most of the research focuses are the development of comprehensive English application ability [1-3]. Meanwhile, English teaching has hit a bottleneck. Accordingly, demands grow for the development of new learning patterns that can meet the requirements of the contemporary English study. Against this background, the English online self-learning mode emerges, receiving research popularity [4]. In this mode, students are taught according to their aptitudes. What is more, the percentage of self-learning time is significantly increased, which helps improve students' learning initiative as they are allowed to implement learning plans out of hobbies and interests [5-6].

There are already some English network autonomous learning platforms developed by Chinese software developers for commercial purposes, albeit deficient and merely school-oriented. Specifically speaking, these platforms are of poor versatility, high cost of development and a limited scope of application. Most of them are related to one-facet link of learning, and thus cannot continue to serve for English learners once

they have extra learning requirements. Another example is the extra high development cost required for two prevailing English online learning platforms: New Idea English and New Horizon College English Online. Even so, they can only train students with one of the listening, speaking, and reading skills [7-9]. Therefore, the self-learning needs cannot be satisfied based on the said platforms, because the learning time and learning contents remain subject to obvious restrictions, and because most of the learning materials are drawn from book knowledge which is of no extra use to students [10]. Almost all of the commonly used autonomous learning platforms are developed by publishers based on their own textbooks, so they can only use the materials they publish and need to pay a high learning cost. The access to learning contents will also be limited, leaving little self-determined options for students to acquire new knowledge [11]. In addition, rarely founded on Moodle and other similar development platforms, these software are functionally deficient, inconvenient to be transplanted and of certain demands for operational systems [12].

## **2 The three-layer B/S model**

The B/S model was used to develop this system in the paper. As a modified version of the C/S model, this model sends user request via web browsers instead of installing clients. After the requests are processed in the web server, the processing result is displayed on the webpage of the browser waiting for users to view the results. Also, many complex functional operations can be carried out similarly, thus significantly reducing the burden on the client. Only a handful of the transaction logic will be performed in the front end, and the majority is handled by the server [13].

The B / S three-tier model system is of great convenience to system managers because the system maintenance/update/modification is implemented on the server end. As the role of web browser is simple to display data processing result, the system availability is also significantly improved. Nevertheless, the B/S model has some shortcomings. In the case that the system is updated or that the data volume continues to increase, the loads on the server are increasingly heavy, which poses higher demands for the server's performance. It also places a noticeable amount of burden on daemon maintenance personnel, and more or less requires more cost to maintain the system back end. Despite those drawbacks, the B/S model still has a broad application prospects, in that the performance and process ability of in-service hardware devices are much better than before and that backup servers are set up to backup and process data independently [14-15].

## **3 Major function code and its implementation**

### **3.1 Homework management**

One of the main functions of this kind of learning platform is to realize homework management. Homework will be finished and uploaded to the platform in the format

of content or document type. Students are grouped and managed on a class basis. Assignments are stored in a class-based manner, checked and corrected conveniently on the platform [16]. After a certain amount of learning tasks are performed, students may practice their English skills for specific purposes according to their own learning portfolios. Moreover, the platform provides writing ability training classes for students and a corresponding access to assignments examination, answer correction and question submission. For those who prefer listening practices, the audio version of listening materials can be downloaded. The homework of special ability training will be uploaded and transferred to the teacher's side. Students can also check and download the corrected homework through the management process (as shown in Fig. 1, and the corresponding interface is shown in Fig. 2 and Fig. 3.)

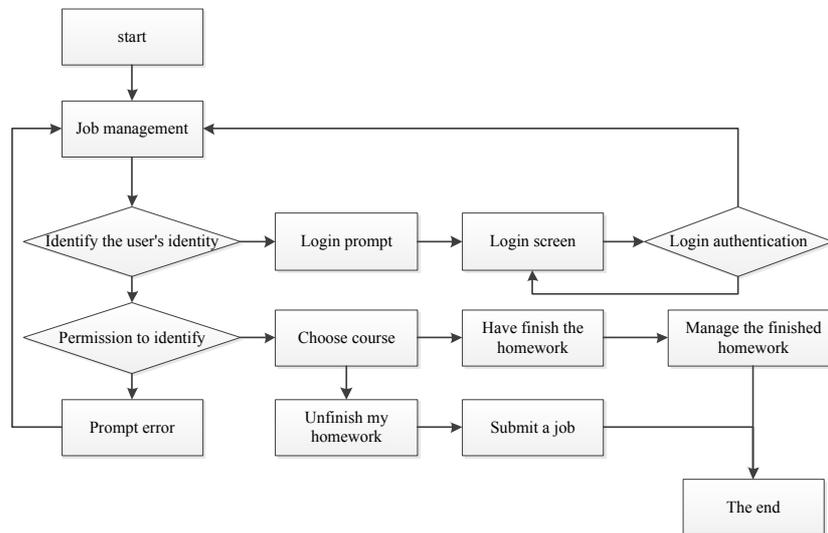


Fig. 1. The flow chart of assignment management

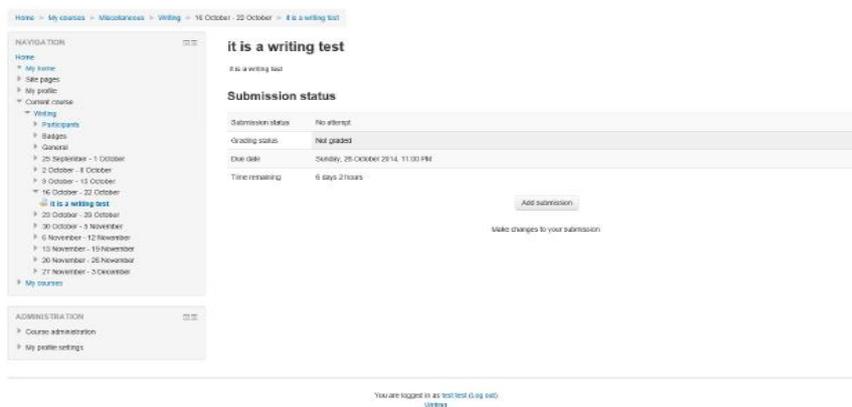


Fig. 2. Assignment management interface



Fig. 3. Assignment submission interface

### 3.2 Q & A and discussion boards

On this platform set up a discussion module and Q & A module, whose openness and functions are similar to BBS and other forums. Both teachers and students can register for the modules, log in the system and participate freely in the discussion of any topics.

This forum is of great convenience for teachers and students to exchange information and to quickly view topic replies. Registered users can post topics and discuss them with other users. Thread starters and other users can click into the topic to have a view or reply messages in time. Without barriers to entry, the discussion boards are open to all users. As the topics and their replies are instantly updated, the discussion board can be regarded somewhat as replacing chatting software, which saves the system resources to re-configure functions. Topics that are compliant with forum requirements can be highlighted, topped or underlined by administrators to classify answers to the same or similar questions, which paves the way for avoiding the occurrence of invalid posts of duplicate questions. Meanwhile, when designing the discussion board, it should be taken into account the learning needs of students at different levels of competence. Also, messages should be categorized appropriately so as to ensure that the topics are well-aligned and clear-cut such that better benefiting students in searching and checking topics in a less amount of time. The forum designed in this way provides students with a quick access to the blocks and messages and discussions as they wish. In addition, there remains space for forums to be subdivided according to actual situations. For instance, a separate discussion zone of English grammars (or listening, or reading) can be left for teachers to answer the questions raised by students. Teachers may post some frequently-seen difficult grammar points and extracurricular reading materials on the platform, or organize students to discuss typical topics with divergent thinking. By doing so, the platform offers opportunities for teachers to play more roles in the relearning process of students. The process of this discussion model is shown in Fig. 4.

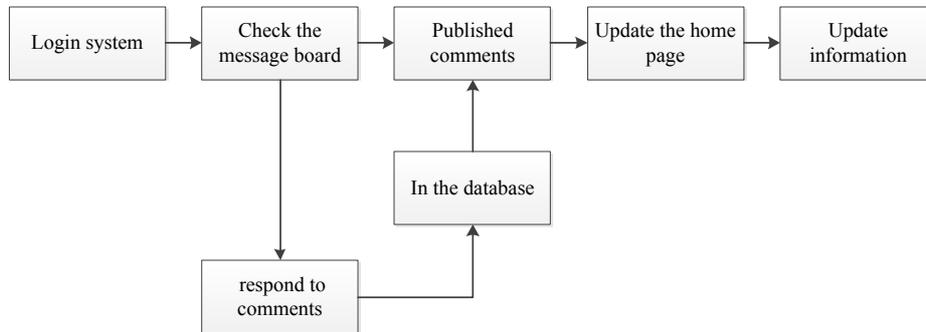


Fig. 4. System message diagram

In order to ensure an easy management of this discussion board, it is necessary to set functional permissions for users of different classes. In this paper, we divide users into teacher users, student users and administrators. The administrator has the most operational permissions among them, followed by teacher users, and the student users are the least permitted. Specifically speaking, administrators are eligible to execute operations of system management, user management and all the other functions, as well as endowing other users with permitted operation rights; teacher users are allowed to lock or delete certain topics, evaluate the validity of messages, manage the scores of assignments and organize discussion-related opportunities; student users are only eligible to execute the most fundamental functions, such as checking and updating registration information and posting topics in the forum. The execution processes of the forum is seen in Fig. 5.

Time	User full name	Affected user	Event context	Component	Event name	Description	Origin	IP address
20 Oct 21:42	Admin User	-	Forum News Forum	Forum	Discussion viewed	The user with id '2' has viewed the discussion with id '1' in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:42	Admin User	-	Forum News Forum	Forum	Discussion viewed	The user with id '2' has viewed the discussion with id '1' in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:41	Admin User	-	Forum News Forum	Forum	Discussion viewed	The user with id '2' has viewed the discussion with id '1' in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:41	Admin User	-	Forum News Forum	Forum	Discussion viewed	The user with id '2' has viewed the discussion with id '1' in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:41	Admin User	-	Forum News Forum	Forum	Discussion viewed	The user with id '2' has viewed the discussion with id '1' in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:41	Admin User	-	Forum News Forum	Forum	Discussion viewed	The user with id '2' has viewed the discussion with id '1' in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:41	Admin User	-	Forum News Forum	Forum	Discussion viewed	The user with id '2' has viewed the discussion with id '1' in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:41	Admin User	-	Forum News Forum	Forum	Course module viewed	The user with id '2' viewed the forum activity with the course module id '1'.	web	192.168.1.177
20 Oct 21:41	Admin User	-	Forum News Forum	Forum	Discussion created	The user with id '2' has created the discussion with id '1' in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:41	Admin User	-	Forum News Forum	Forum	Some content has been posted	The user with id '2' has posted content in the forum post with id '1' in the discussion '1' located in the forum with the course module id '1'.	web	192.168.1.177
20 Oct 21:21	Admin User	-	Forum News Forum	Forum	Course module viewed	The user with id '2' viewed the forum activity with the course module id '1'.	web	192.168.1.177

Fig. 5. The system log/message interface

### 3.3 English learning test

After completing study programs in a period of time, it is necessary for students to test their learning outcomes. As the traditional mode of learning effect evaluation, exams are of low efficiency, great limitations and obligatory property. Such being the case, in order to facilitate students to test English learning effect, we design a learning test function module based on the analysis of the test needs of students. The quiz are pre-stored in the test base of the system. In the test time, students should enter the self-test module, choose the test mode and test contents and have the test. The interface of the test module is shown in Fig. 6.

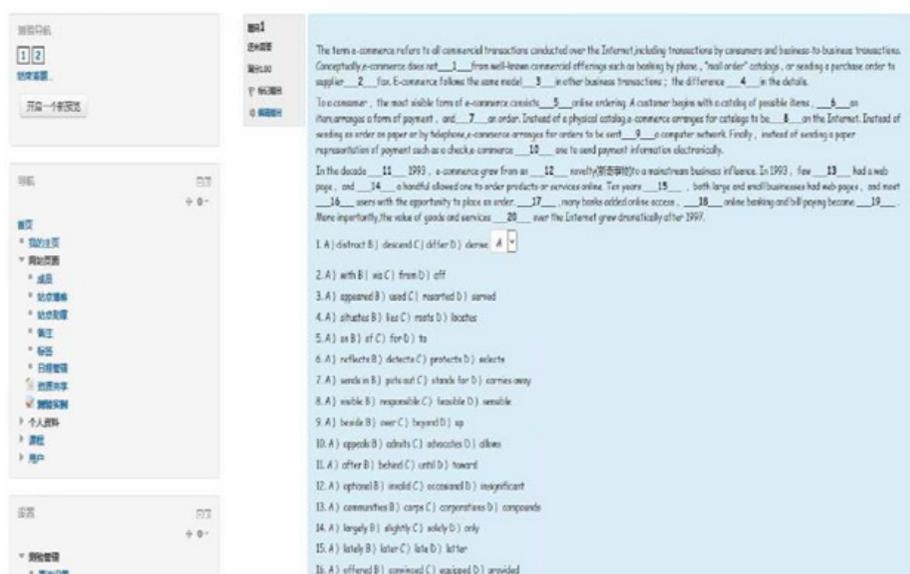


Fig. 6. The interface of the test module

### 3.4 Statistics of English skills self-test scores

Students are required to receive various tests in order to verify the effect of self-learning. Therefore, self-test becomes one of the core functions of the English learning system proposed in the paper. However, due to lack of statistics, test results cannot reveal more issues than otherwise, of little help to the development of students. Therefore, it is necessary to statistically analyze the scores of self-test. To this end, we design a statistical module of test scores, which is different from the performance management module. It can analyze the test scores of the students and store the results in the database. Teachers can also list the sub-scores of fundamental English skills for students to check. Accordingly, students perceive the learning status and can strengthen the training of weak points to help improve English competence. The interface of this test module is shown in Fig. 7.

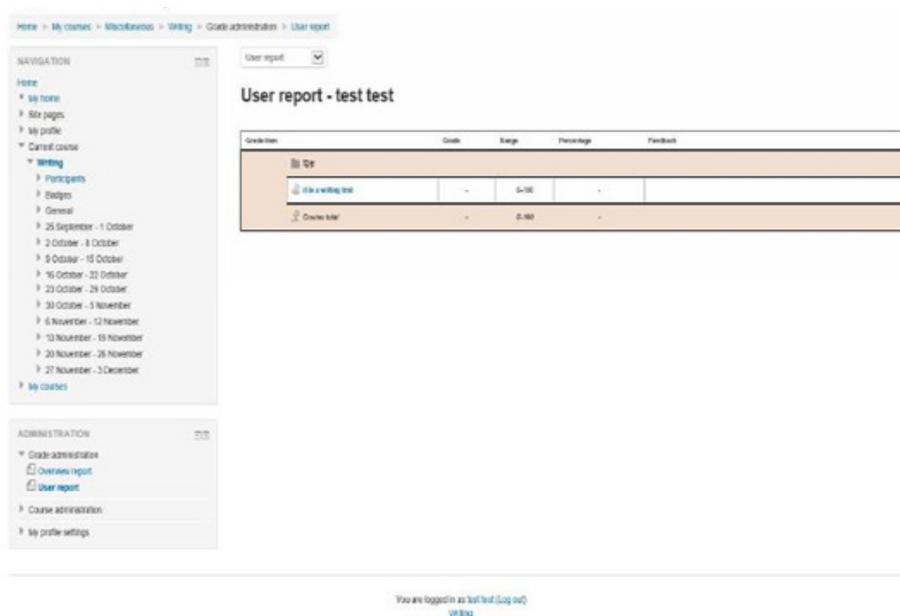


Fig. 7. The interface of the test module

#### 4 System test

After the system design is implemented, we test system functions and performances so as to ensure the realization of the development goal. The above test results prove the high practicability and security of the system. The system functions are verified achieved, and system performances satisfy the design requirements. Nevertheless, there still remain some shortcomings of system design, as listed in Table 1.

Table 1. English network learning platform function evaluation

The function	Software error	Software defect	Software limitations	Note
The user login	The possibility of SQL injection	login authentication code setting	None	Registered users
upload	A page may collapse	Upload the file type limit is too high	file size limit	Add audio files
Community message	potential to spam blocking	No refused to accept the message set	None	None

#### 5 Conclusion

This paper mainly discusses the current situation of domestic English learning, and analyzes college students' needs of online English learning. Based on this, we design

a B/S platform based online English learning platform. In addition to the use of student-oriented development technologies, we specifically analyzed the development feasibility and business procedures, and accordingly design and implement the system models and function modules. In the final step, we test the design systems. The test result shows that the goal of system development has been achieved with the realization of all the system functions, and that the system can be somewhat conducive to online English learning.

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