

## *Retraction*

# **Retracted: Research on English Online Test Platform Based on Real-Time Web Communication Technology**

## **Security and Communication Networks**

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

## **References**

- [1] J. Huo and C. Wang, "Research on English Online Test Platform Based on Real-Time Web Communication Technology," *Security and Communication Networks*, vol. 2021, Article ID 7813151, 12 pages, 2021.

## Research Article

# Research on English Online Test Platform Based on Real-Time Web Communication Technology

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Due to the multiattribute and multi-related problems of the target English test platform, the efficiency of the platform is low. In order to solve the problem of insufficient control of the difficulty of the test questions in the process of English test paper generation, this paper designs an English test platform based on real-time network communication technology. The English test platform designed in this paper includes three modules: user management module, question bank management module, and test paper management module. Among them, in the test paper management module, we extract English test questions according to the test paper generation strategy, then use real-time web communication technology according to the test paper generation target, and, through effective update of pheromone, solve the problem of high test question repetition rate in automatic test paper generation and design the network. The self-learning platform and English test platform modules have completed the design of the English test platform based on real-time network communication technology. The experimental results show that the designed English test platform has a high success rate, quick test paper generation time, and good application value.

## 1. Introduction

The rapid development of modern computer information technology and Internet technology has gradually begun to be deeply applied to various fields. At the same time, it has also brought fundamental changes in the field of education [1]. Modern teaching and learning methods have been constantly updated and developed. However, as a very important part of education, the information construction and development of examination are relatively slow. Various types of examinations traditionally use manual examination methods, and now intelligent examination has been gradually implemented. The way of English examination has changed from paper examination to automatic intelligent online examination. The English examination platform is a new educational evaluation system, which can connect artificial intelligence with educational theory [2, 3]. According to the examination rules and the performance indicators formulated by users, the examination platform selects a group of test papers and test questions that meet the

requirements in the test question bank, and typesets and prints them [4]. The design of English examination platform can reduce the workload of teachers, separate examination from teaching, ensure the quality of examination, and realize the scientific management of curriculum teaching.

Many scholars have done a lot of research on English examination platform. Lin et al. [5] put forward the exploration of objective problem evaluation of English teaching platform under the background of big data. Taking big data as the background, first, it analyzes the advantages and disadvantages of objective problems in English teaching platform and further proves the side effects of objective problems on students' learning and teachers' teaching through experiments. On this basis, this paper puts forward some effective suggestions on the test question design of English teaching platform, so as to improve the rationality, objectivity, and efficiency of English test and promote the progress and development of teaching. Reference [6] takes higher vocational English majors as an example to study the impact of online English writing

platform on writing metacognitive strategies and writing performance. Through teaching experiments, it investigates the use of writing metacognitive strategies of higher vocational English majors in the online writing environment and points out that there is a close relationship between the use of writing metacognitive strategies and writing performance of higher vocational English majors. At the same time, the experiment also proves that the integration of online English writing platform into higher vocational English writing teaching can not only improve students' writing metacognitive strategies and the three strategic dimensions of choice attention, self-monitoring, and self-evaluation but also effectively improve students' writing performance. Based on the above research, an English examination platform based on real-time web communication technology is proposed. Real-time web communication technology can not only save a lot of human and material costs but also improve the level and management efficiency of English examination. Compared with the traditional artificial English test mode, real-time web communication technology has very prominent advantages because it is not constrained by time and space. At the same time, the online examination mode can effectively replace a series of heavy work such as traditional examination organization, test paper generation, marking, and statistical analysis and greatly improve the efficiency of online examination and the level of examination management. In the development process of online examination information platform, it has experienced stand-alone examination management platform and network examination platform. The stand-alone version of the examination management platform is built based on the C/S architecture mode, while the network version of the examination management platform is built based on the B/S architecture mode. While breaking through the constraints of examination time and space, it can automatically complete the processing of automatic generation of test questions, online submission of test papers, and timely marking of scores in English examination, so as to effectively realize the examination management of automatic marking, statistics, query, and analysis. In this mode, teachers' workload is greatly reduced, and their main task is to carefully design English test questions, regularly maintain, and update an English test question bank. While reducing the workload of teachers, it also realizes the paperless and automatic English examination, which greatly improves the efficiency of the organization and management of English examination. Especially important, because the English test paper is generated randomly, there will be no leakage of the test paper and cheating in the test, so as to smoothly ensure the fairness of the test and safeguard the interests of candidates. It can be seen that the research on the English examination platform based on real-time web communication technology can effectively reduce the burden of examination management, reduce the cost of examination organization, reduce the workload of teachers, and greatly improve the efficiency and quality of examination management. It has certain practical significance and more feasible practical application value. Due to the large size of the listening file,

how to ensure the smooth playback of the listening file has become a problem that must be solved in the online examination. Reference [7] focuses on solving college English listening online examination by using streaming media technology. Especially in recent years, online English learning platforms have also attracted the attention of students, parents, and teachers. However, in the face of this new thing, many people have a skeptical attitude. Therefore, Reference [8] has carried out systematic research in the context of online learning in English. Reference [9] proposed an overall design scheme of an interactive intelligent online-assisted translation platform based on a variety of strategies. The platform realizes the integrated processing of multiple translation modes based on rule analysis, analogical reasoning, and statistical knowledge. Reference [7] studied the use of streaming media technology to solve the problem of online college English listening test. This paper gives an overview of streaming media technology and proposes to build an online college English listening test platform by using streaming media technology.

Our contribution is threefold:

- (1) In order to solve the lack of control over the difficulty of questions in the process of English examination paper generation, an English examination platform based on real-time web communication technology is designed.
- (2) The test paper management module extracts English test questions according to the test paper generation strategy, adopts a real-time web communication technology according to the test paper generation objectives, and solves the problem of high repetition rate of test questions in automatic test paper generation by effectively updating pheromones.
- (3) The experimental results show that the designed English test platform has high success rate and rapid test paper generation time, and has a good application value.

The remainder of this paper is organized as follows. Section 2 discusses the English examination platform based on the real-time web communication technology. Section 3 discusses the design process of the English examination platform based on the autonomous learning mode. Section 4 discusses experiment and analysis. Section 5 presents the conclusions of the study.

## 2. English Examination Platform Based on Real-Time Web Communication Technology

*2.1. Overall Structure of the Platform.* In order to improve the efficiency of automatic test paper generation, an English test platform based on real-time web communication technology is studied. The overall structure of the platform is shown in Figure 1.

The English examination platform is composed of user management, question bank management, test paper management, and other modules [10]. The user management module is used to set the permissions of platform users. The

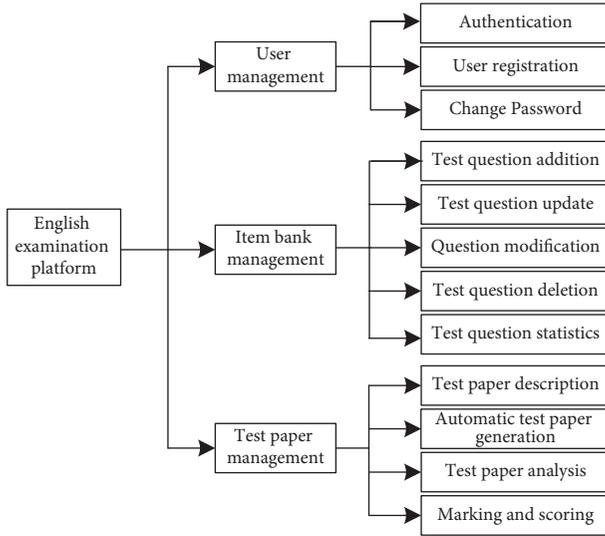


FIGURE 1: Overall structure of English examination platform.

user administrator can modify the important data in the platform. The platform administrator realizes the user authority authentication through the user management module. After the authentication is successful, the question bank management is implemented. In the question bank management module, the English test questions are added, updated, deleted, counted, and modified. The automatic test paper generation and later English test scoring of the test paper are implemented through the test paper management module.

**2.2. Item Bank Management Module.** The question bank management module includes submodules such as English question addition, English question update, English question modification, and English question statistics [11, 12]. The process of adding English test questions is shown in Figure 2.

It can be seen from Figure 2 that according to the design requirements of English test question bank, English teachers enter the test question table suitable for English test and include various information tables in the database [13], for example, English test question type table, English test question difficulty table, English test paper information table, and knowledge point table.

**2.3. Realization of Automatic Test Paper Generation.** Automatic test paper generation is an important part of the whole platform. It is implemented by inputting relevant parameters according to user needs to generate test papers that meet the requirements of English examination [14, 15]. The use case diagram of automatic test paper generation is shown in Figure 3.

It can be seen from Figure 3 that English teachers with management authority complete the generation of English test papers and English test paper answers through the automatic test paper composition submodule.

The design of the automatic test paper submodule of English test platform based on real-time web communication technology mainly involves test paper strategy, test paper goal, and optimization solution of real-time web communication technology.

**2.3.1. Test Paper Formation Strategy.** Test paper generation strategy is the main form of test paper control parameters. Test paper control parameters are set: the score of each question type is described by  $T_{W_j}$ , the estimated time of the test paper is described by  $T$ , the question type of the test paper is described by  $j$ ,  $j = 1, 2, 3, 4, 5$ , five different question types are represented by numbers 1–5, the distinction of the test paper is described by  $D$ , the number of questions of each question type is described by  $T_{N_j}$ , and the total score of the test paper is described by  $W$ . The number of questions in the test paper is described by  $N$  and the difficulty of the test paper is described by  $P$ . The calculations of test paper difficulty  $P$  and test paper discrimination  $D$  are described by Formulas (1) and (2), respectively:

$$P = \sum_{j=1}^5 \frac{(T_{P_j} \times T_{W_j})}{W}, \quad (1)$$

$$D = \sum_{i=1}^N \frac{(D_i \times W_i)}{W}. \quad (2)$$

In the formula, the difficulty of each question type is described by  $T_{P_j}$ . In order to avoid the influence of high individual difficulty on the average score of the test paper, the restrictive condition of  $T_{P_j}$  is added to the test paper goal. The difficulty  $T_{P_j}$  of each question type is described as

$$T_{P_j} = \sum_{i=1}^N \frac{(P_i \times W_i)}{TW_j}. \quad (3)$$

**2.3.2. Test Paper Goal.** The expected goal of generating test paper is described by the quantitative value of test paper control parameters. The paper generation objectives in the platform are as follows:

- (1) The number of questions required in the test paper is described by  $N_R$ , which is equal to the actual number of questions in the test paper, as shown in the following formula:

$$N_R = N = \sum_{j=1}^5 TN_j, \quad (4)$$

- (2) The total score required in the test paper is described by  $W_R$ , which is equal to the actual total score of all question types in the test paper, specifically:

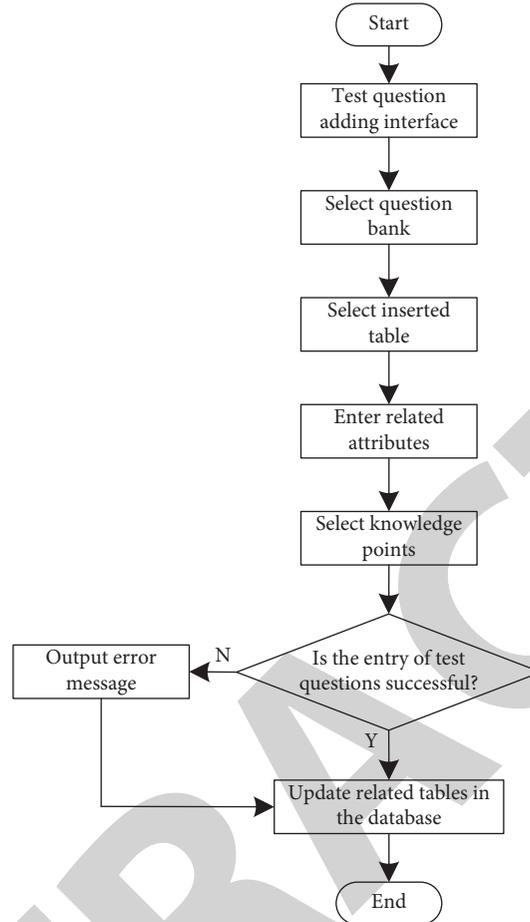


FIGURE 2: Test question adding process.

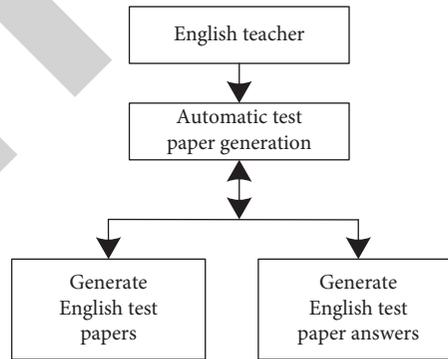


FIGURE 3: Use case diagram of automatic test paper generation.

$$W_R = W = \sum_{j=1}^5 TW_j. \quad (5)$$

$$T_R = T = \sum_{i=1}^N T_i. \quad (6)$$

(3) The test time required by the test paper is described by  $T_R$ , which is equal to the total actual test time of all test questions in the test paper, as shown in the following formula:

In the formula, the answer time of question  $i$  is described by  $T_i$ .

(4) The required difficulty is described by  $P_R$ , which is roughly the same as the actual difficulty of the test

paper described by  $P$ , as shown in the following formula:

$$\left(\frac{|P_R - P|}{P_R}\right) \leq \omega P. \quad (7)$$

In the formula, the difficulty error limit ratio of the test paper is described by  $\omega P$ .

- (5) The required discrimination is described by  $D_R$ , which is roughly the same as that described by  $D_R$ , specifically:

$$\left(\frac{|D_R - D|}{D_R}\right) \leq \omega D. \quad (8)$$

In the formula, the discrimination error limit ratio of the test paper is described by  $\omega D$ .

- (6) The required difficulty is described by  $T_{P_j}$ , which is roughly the same as the actual difficulty of each question type described by  $T_{P_j}$ , specifically:

$$\left(\frac{|T_{PR_j} - T_{P_j}|}{T_{PR_j}}\right) \leq \omega P_j. \quad (9)$$

In the formula, the difficulty error limit ratio of question  $J$  is described by  $\omega P_j$ .

**2.3.3. Real-Time Web Communication Technology.** The automatic test paper formation submodule adopts a real-time web communication technology to reduce the pheromone of the selected test questions, improve the selection probability of the unselected test questions [16, 17], and realize the intelligent automatic test paper formation of English examination.

- (1) Initialization and update of pheromone: the pheromone of each test question is directly proportional to the weight. For the continuous interval in each range, the lower the weight, the smaller the pheromone value, and the lower the probability of being selected. The pheromone value is described by the weight of one interval.

Hypothesis: one length interval is described by  $L$ , and one requirement is set to reduce the computational overhead and reduce the wide difference in the selection of test questions. The setting requirements are described by the following formula:

$$L > (t_{\min} \times Q) \times n. \quad (10)$$

In the formula, the parameter coefficient is described by  $n$ . The minimum weight is the minimum value of the selected pheromone, which is described by  $T_{\min}$ . The total number of test questions in the question bank is described by  $Q$ .

Before the platform runs, set the initial value and expand the length interval to meet the increasing

area of the number of test questions. If  $L$  does not meet the conditions, the amplification rule is described by the following formula:

$$\text{While } (L > (t_{\min} \times Q) \times n), \\ \text{Do } \{L = L' \times m\}. \quad (11)$$

In the formula, the parameter coefficients are described by  $m$ .

In order to ensure a reasonable selection range of space,  $L$  needs to be updated.

First: in the case of a new topic. For the newly inserted topic, use the following formula:

$$t_{\text{new}} = \frac{L}{Q + 1}. \quad (12)$$

The original title is described by the following formula:

$$t_{\text{new}} = \begin{cases} t_{\text{old}}, & t_{\text{old}} = t_{\min}, \\ t_{\text{old}} - \frac{L}{(Q + 1)Q}, & \text{else.} \end{cases} \quad (13)$$

In the formula, the original pheromone of the original test question is described by  $t_{\text{old}}$ , the set length interval is described by  $L$ , and the number of original questions is described by  $Q$ .

In order to ensure the stability of the platform, insert the new item pheromone with the average value of the item pheromone and reduce the occupation weight on the original item score.

Second: update the pheromone of the test questions after the examination. The selected topic is described by  $i$ , as shown in the following formula:

$$t_i^{\text{new}} = t_{\min}. \quad (14)$$

Other topics are described by  $j$ , as shown in the following formula:

$$t_j^{\text{new}} = t_j^{\text{old}} + \frac{t_i^{\text{old}} - t_i^{\text{new}}}{Q - 1}. \quad (15)$$

In the formula, the updated pheromone of the selected test questions is described by  $t_i^{\text{new}}$ . The minimum pheromone  $t_{\min}$  is described by  $t_i^{\text{old}}$ ; select the original pheromone of the test question and describe it with  $t_j^{\text{old}}$ . The updated pheromone of unselected test questions is described by  $t_j^{\text{new}}$ .

Reduce the pheromone of the selected test questions in the test, reduce the repetition rate of the test questions, and increase the probability of other test questions being selected.

- (2) Path construction: the path construction of ant foraging is to select questions according to

pheromones in the question bank when the constraints are met. This method is applied to the selection of test question set. If item  $i$  is selected, the selection probability of item  $j$  is described by the following formula:

$$Q_{ij} = \frac{[t_j]^\alpha [\eta_j]^\beta}{\sum_{l \in N_i} [t_l]^\alpha [\eta_l]^\beta}, \quad \text{if } j \in N_i. \quad (16)$$

In the formula, heuristic information is described by  $\eta_j$ , and the relative influence of heuristic information is determined by the parameter  $\beta$ . The pheromone of question  $j$  is described by  $t_j$ , and the pheromone is determined by the parameter  $\alpha$ ; select question  $i$  and then question  $j$ , and the selection probability is described by  $Q_{ij}$ . After the  $i$  question is selected, the test set that can be selected is described with  $N_i$ .

The text feature selection objectives of English test words include the following two aspects:

- (1) Selecting the feature subset of English test words makes the text classification accuracy of English test words higher.
- (2) The feature dimension of English test words is the smallest as possible.

In practice, the two aspects contradict each other. In order to make it more balanced, the calculation formula of the evaluation function of word feature selection in English examination is as follows:

$$\max F = A + \lambda \frac{v}{N}. \quad (17)$$

In the formula,  $N$  represents the total dimension of the candidate feature set of English test words;  $A$  represents the recognition rate of word features in this English test;  $\lambda$  represents the weight to balance the maximum English test word feature recognition rate and the English test word feature dimension; and  $F$  represents the evaluation function value of English test word features.

Let the ant search the  $v$  important English test word feature  $f_m$  at  $t$  time and then search the  $e + 1$  important English test word feature  $f_n$  through  $e$  sub important English test word features; it is necessary to conduct local search of English test words in the feature set  $U$  ( $U \neq \emptyset$ ) composed of  $e$  English test word features. Let  $C U$  represent any subset of English test words as  $u_v$ , which is recorded as

$$S_v = S_m \cup u_v \cup \{f_n\}. \quad (18)$$

Then the optimal subset  $u_e$  of English test words meets the following conditions:

$$F(S_e) = \min_v (S_v, \forall v). \quad (19)$$

When the whole ant colony completes the construction of the solution once, the recognition results of the English test word classifier corresponding to each solution are calculated, and then the fitness value of each ant is obtained. Then, the global update of the English test word pheromone

is carried out according to formula (20). The expression is as follows:

$$\begin{cases} \tau_{ve}(z+1) = \rho \times \tau_{ve}(z+1) + \sum_y \Delta \tau_{ve}^y, \\ \Delta \tau_{ve}^y = \frac{Q}{F(s_y)}. \end{cases} \quad (20)$$

In the formula,  $F(s_y)$  represents the fitness value of the word feature subset  $s$  of the English test;  $\rho$  represents the pheromone residue factor of English test words;  $z$  represents the number of iterations;  $y$  represents the number of ants; and  $Q$  indicates the growth rate of word pheromone in the English test. A feature classifier of English test words is established by using a neural network. A neural network is composed of  $r$  input nodes,  $I$  hidden layer nodes, and 1 output node. The hidden layer node of English test words is the neural network function of English test words, expressed as

$$h = \exp\left[-\frac{\|I - c + r\|}{2\sigma w}\right]. \quad (21)$$

In the formula,  $\sigma$  is the hidden node width of neural network for English test words,  $c$  represents the midpoint of the  $r$  hidden node of the neural network of English test words, and  $w$  is the output weight of English test words neural network.

### 3. Design Process of English Examination Platform Based on Autonomous Learning Mode

*3.1. Design of Network Autonomous Learning Platform.* For learners, autonomous learning makes them have the ability to “learn to learn.” The whole learning process can be regarded as the process of selecting learning strategies, and the learning strategies are formed under the action of learning subjects and objects.

The flowchart of autonomous learning mode is shown in Figure 4.

In order to enable students to carry out learning activities freely in the learning process and truly become the main body of their own learning, it is necessary to establish an environment conducive to knowledge mastery for students, not just simple knowledge teaching. Learning should be a process of knowledge construction by students themselves.

Teaching media is very important in stimulating the interest of learning objects. A foreign language network autonomous learning platform is constructed based on real-time web communication technology. The main contents of the platform are composed of the following aspects (Figure 5 shows the composition of the autonomous learning platform):

- (1) Featured content presentation: autonomous learning is constructed through the network. The intermediary media between teaching subjects are network technology and multimedia technology. Compared

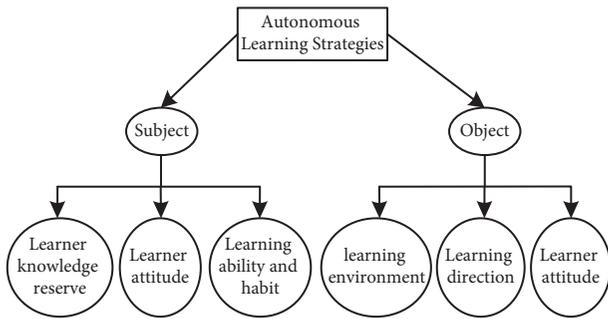


FIGURE 4: Flowchart of network autonomous learning mode.

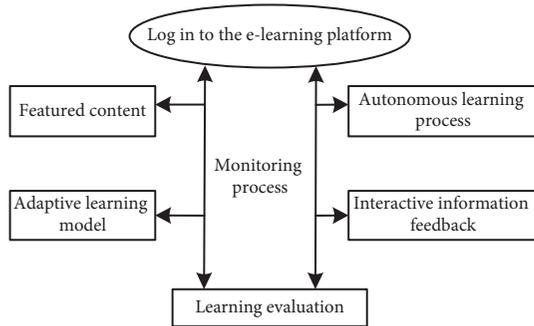


FIGURE 5: Network autonomous learning platform.

with the traditional classroom form [18], the form of this teaching information is more rich, intuitive, and three-dimensional. The learning resources made of paper teaching materials are the main body of traditional teaching content. Learners with different knowledge levels will carry out targeted learning content in the appropriate learning stage.

- (2) Designation of adaptive learning mode: when selecting the learning mode, the implementation scheme of the platform is relatively loose and has strong adaptability. According to the learning state of each learner, the optimal learning mode of the next stage is freely selected. Learners can subjectively judge the learning content recommended by the platform. If they have mastered this part of knowledge, they will jump to the homework and unit test link. In each unit, the teacher will publish the training content as the unit homework. Students need to complete and submit the received homework on the web page. The homework scores and standard answers will be automatically checked through the platform and then fed back to students. If the standardized unit test passes, you can automatically enter the next unit to continue learning. By formulating these teaching strategies, guide students to enter their own learning channel and find their own teaching mode and learning state in the platform.
- (3) Autonomous learning process management: monitoring and managing learners in the daily learning process is the main content of autonomous learning

process management of network teaching platform. In addition to monitoring many routine network operations such as login, exit, and query, it is also necessary to monitor the behavior characteristics generated in the process of students' autonomous learning. In order to ensure the effectiveness of the learning process, it is necessary to monitor the client behavior so that students cannot run websites and software unrelated to learning. In order to ensure that the function of the teaching platform can be effectively applied, it is necessary to monitor the learning process and maximize learners' consciousness in the process of autonomous learning under the monitoring of a third party. In addition, the learning process data collected by the platform are very reliable and can be used as the basis for putting forward the personalized teaching scheme of the next learning process.

- (4) Interactive information feedback: in addition to the feedback functions of course selection, homework, and testing, there are also interactive platform functions such as application forum, short message, class appointment, and comment, which can also realize information feedback with teachers. Curriculum forum, teacher forum and class forum form a forum platform. The corresponding forum can provide corresponding interest topics for various learning groups so that the problems in the use of the network autonomous learning platform can be solved.

The appointment function is another special function of the platform design. The purpose is to realize face-to-face Q&A for students and put forward questions to teachers in the teaching question module of the platform, and teachers answer accordingly in this module. In addition, the platform also provides the corresponding evaluation function to evaluate the teaching effect of teachers. This feedback method is conducive to improve the teaching quality and the technical improvement of the network teaching organization mode.

*3.2. Module Design of English Examination Platform.* The platform based on the B/S structure only requires the client to install browser, RealPlayer plug-in, and voice equipment to realize online oral follow-up training. To realize the following reading platform, we must first connect the data access layer and the database.

The main task of the data access layer is to provide data operations to the business layer, that is, to connect to the underlying database. Through the objects of the data access layer, the objects in all business layers can access the database. The data access layer types are organized by business objects. The data in all business objects may be included in several different data tables, which are responsible for mapping the relationship between surface objects and databases.

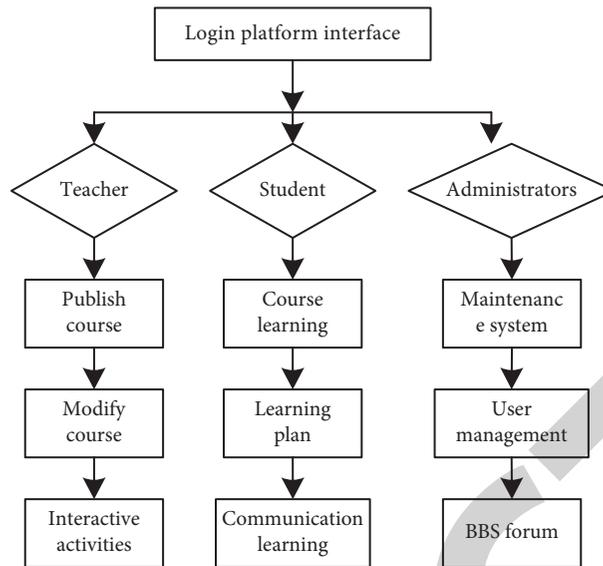


FIGURE 6: Schematic diagram of platform user module.

Based on the B/S structure data, the platform functions are mainly divided into several modules. The specific modules are as follows:

- (1) User information management module:
  - ① learner: log in to the platform to determine the learner's identity and record each learning situation. In the platform blog, learners can not only write down their own learning experience, experience, and learning plan but also upload or download their own and others' works, select the learning content suitable for themselves, and conduct prelearning. After the test, you can better understand the learning progress by viewing the evaluation module.
  - ② Teachers: after logging in, they can publish multimedia teaching materials or change course information. Teachers can carry out a series of forum discussion activities, such as answering students' questions, discussing with students, two-way communication, and course discussion with other English teachers.
  - ③ Administrator: platform maintenance, user management, and forum message board management. The specific user module diagram is shown in Figure 6.
- (2) Curriculum management and release module: in the traditional classroom, because the teacher's teaching mode has a great impact on students, network teaching can realize the opening of the teaching mode, enable different teachers to deeply mine the English learning content, and add or change the content online, which is no longer limited to a single teaching mode. At the same time, provide online teaching discussion area so that teachers can discuss teaching content and mode online and realize real-time communication.

The module uses the combination of file platform and multimedia attribute database to manage the data uploaded by teachers. The multimedia data are placed in the file platform and connected with the

corresponding data records between the database through network location information. The multimedia database is the basis of independent training and learning on the reading training platform, which directly affects the relationship of media data management. The learning materials in the database include multimedia data such as sound data, picture data, and video, which will be stored in the web server directory in the form of files.

The schematic flowchart of the module is shown in Figure 7.

- (3) Learning and training module: after English teachers publish the added teaching materials in the platform, they can provide students' learning or teachers' viewing function. This module is the key module of the follow-up training and learning platform. Users can use this module after logging in to the platform. By typing the appropriate search keywords, you can search for the required learning materials. The follow-up training materials are provided and generated by the database, and the follow-up training resources are displayed to the login users by using the web situation, so as to realize the synchronization of multimedia and text materials. When the network speed is slow, you can download the follow-up training materials and play them with the follow-up training plug-in to realize the follow-up self-study process.
- (4) Personal space module: each registered learner has a personal space. Students can record the results of follow-up training with the original voice software on the computer, save the files, and upload them to their personal space. The teacher will visit the student space and evaluate it. At the same time, other students can also evaluate the recording. This method can stimulate students' interest in learning English

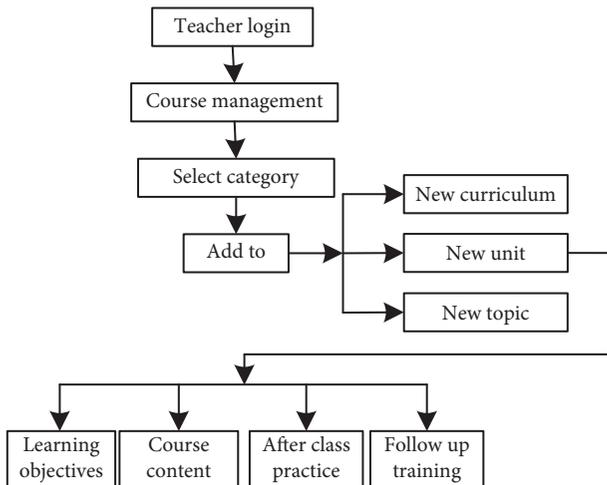


FIGURE 7: Flowchart of course management and release module.

and increase English communication between learners.

- (5) Interactive communication module: this module uses BBS offline discussion and Q&A and Net-Meeting online discussion and Q&A to carry out interactive communication between teachers and students. NetMeeting online discussion refers to the real-time discussion between learners, students and teachers, and teachers and teachers. BBS offline discussion and Q&A refer to a platform provided for mutual communication between teachers and students or between teachers and teachers. The discussion area has different communication topics according to different communication objects. Even if you do not participate in the discussion, you can get help from the topics discussed by others. Learners can realize mutual evaluation on microblog, realize learning exchange, and obtain learning experience. Teachers can master students' learning situation and learning attitude by browsing microblog.
- (6) Evaluation module: this module is divided into teaching test evaluation, autonomous learning record, teacher learning evaluation, and personal evaluation. Test question evaluation refers to the process in which learners conduct self-evaluation on the learning evaluation results, conduct self-test after selecting the test questions with a certain level of difficulty, extract the test papers from the platform and answer the test papers, view the scores according to the test paper answers provided in the platform, and understand the process of autonomous learning in time.

After students know their learning situation by viewing their learning records, teachers evaluate students' subjective learning attitude and learning effectiveness according to the students' situation recorded on the platform. Individual students can also evaluate themselves according to their own learning situation and teacher evaluation, and change their

personal learning plan. Other students can also make constructive comments or put forward opinions on a student in the platform.

#### 4. Experimental Analysis

In order to evaluate the performance of the English test platform in this paper, 6G memory is run in the Windows Server 2018 test environment, and the platform is applied to simulate the construction of a school test question bank. 600 test questions are stored in the test question bank as required, and the attribute values are random, including 200 calculation questions, 200 single-choice questions, and 200 multiple-choice questions. Requirements for setting test paper: the overall difficulty of English test paper is 0.5, the estimated time of English test is 120 minutes, and the total score of English test paper is 100. The number of iterations in the experiment is 200. LoadRunner is used to simulate the English test of the school. 200, 400, 600, 800, 1000, 1200, and 1600 English test students are selected, and the English test parameters are selected at the same time. The English test adopts the setting that the user's thinking and reaction time is one second.

Using the weight  $\lambda$  of balancing the maximum English test word feature recognition rate and the English test word feature dimension in Section 2.3.3, the selection efficiency of the design method of the high similarity English test word autonomous selection platform is affected, as shown in Figure 8.

As shown in Figure 8, we can see the selection efficiency of the high similarity English test word independent selection platform design when selecting 700 English test word data sets and 200, 400, and 600 English test word data sets. Among them, when  $\lambda = 1$ , the selection efficiency of high similarity English test words independent selection platform design is 30%, 38%, and 60%, respectively; when  $\lambda = 3$ , the selection efficiency of high similarity English test words independent selection platform design is 42%, 48%, and 72%, respectively; and when  $\lambda = 5$ , the selection efficiency of high similarity English test words independent selection platform design is 60%, 70%, and 90%, respectively. The analysis shows that the selection efficiency of the platform designed in this paper is the highest when the weight  $\lambda$  balancing the maximum English test word feature recognition rate and English test word feature dimension is in the interval [1, 5].

Through the English examination platform, learners can record their personal learning progress and learning process, teachers' understanding of the learning process and progress, and test students with the test function. Table 1 shows that after learning with the platform, the average scores of 50 students are counted, and the differences between before and after using the platform are also compared.

It can be seen from Table 1 that the average English scores of students before using the three platforms are the same, but after using the designed platform, reference [5] platform, and reference [6] platform, respectively; the average English scores of students have been improved to varying degrees, but the designed platform has significantly

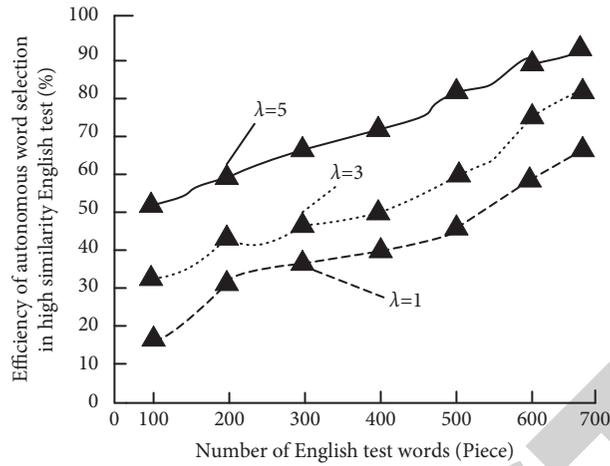


FIGURE 8: Selection efficiency of high similarity English test words' autonomous selection platform design.

TABLE 1: Comparison of students' average scores after using the platform.

Different platforms	Average score of students before platform application (points)	Average score of students after application of the platform (points)
English examination platform	81	95
Reference [5] platform	81	88
Reference [6] platform	81	89

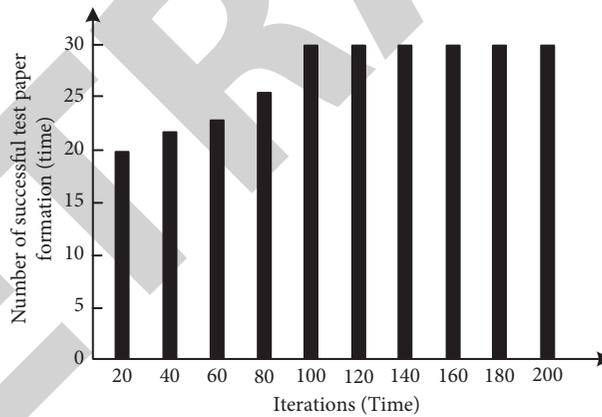


FIGURE 9: Number of successful test paper formation.

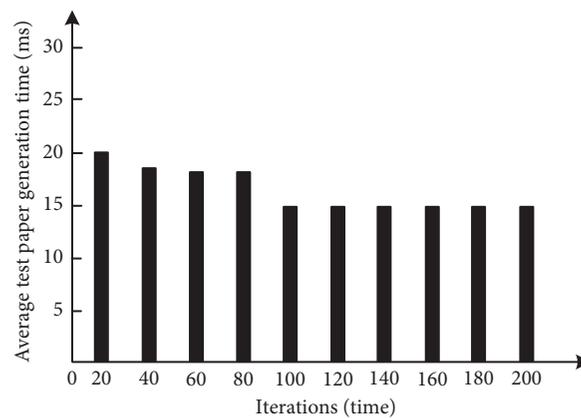


FIGURE 10: Average test paper generation time.

improved their scores, and it shows that the English examination platform is a feasible platform to improve the English achievement level.

Through the designed English examination platform based on real-time web communication technology, 30 test papers are formed, and the number of successful test papers is shown in Figure 9. The average time of each test paper formation is shown in Figure 10.

It can be seen from Figures 9 and 10 that when the number of iterations of the platform in this paper is 100, the number of successful test paper formation reaches the optimal state, and the number of successful test paper formation is 30, and the average test paper formation time is as low as 15 ms, indicating that the platform in this paper has a high success rate and a fast test paper formation speed.

## 5. Conclusion and Prospect

Experiments show that the English examination platform designed based on real-time web communication technology has high selection efficiency and can improve students' academic performance. The platform meets the standards of English examination, has high success rate and fast time, and has a good application value.

In the actual operation process, some deficiencies and improvements of the English examination platform are discussed and analyzed as follows:

- (1) Considering the complex factors affecting the design of the English examination platform, some advanced functions involved in the platform, such as some performance optimization solutions of the platform, need to be further realized. Some functions such as paper generation management, interface aesthetics, and subjective question evaluation and analysis do not meet the expected requirements.
- (2) The security control of English examination platform needs to be further solved. Due to the wide range of security control contents involved in the English online examination platform, many data are private and confidential data of the examination, and the problems related to data confidentiality and integrity need to be further studied.
- (3) Application of the platform: how to make the application of the platform more general remains to be further analyzed and studied in the process of follow-up work.
- (4) Intelligent platform: for the data statistics and analysis involved in the English examination platform, as well as the requirements of English examination data mining and intelligent analysis, the platform has not been implemented so that the platform does not have the functional requirements of providing decision support.

## Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

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