Hindawi
International Journal of Antennas and Propagation
Volume 2021, Article ID 7648856, 10 pages
https://doi.org/10.1155/2021/7648856

Research Article

Research on Design and Application of Online English Education Platform Based on Web

Yijuan Huang

School of Foreign Languages, Nanyang Institute of Technology, Nanyang 473004, China

Correspondence should be addressed to Yijuan Huang; hyj@nyist.edu.cn

Received 20 August 2021; Accepted 8 October 2021; Published 22 October 2021

Academic Editor: Giuseppe Castaldi

Aiming at the problems of low user satisfaction and long response time in traditional online English education platforms, this paper designs a web-based online English education platform and carries out relevant application tests. With the support of the web, the hardware and software of the platform are designed. The hardware of the platform is composed of student module, teacher module, administrator module, and database module. On this basis, the *K*-means clustering method is used to cluster the learner data in the web, to determine their English level, and the collaborative filtering algorithm is combined to recommend relevant course materials for learners so as to complete the platform software design. The application test results show that the platform has the advantages of superior function and security, high user satisfaction, and short response time and has certain practical application value.

1. Introduction

With the continuous updating of knowledge, the rapid development of science and technology and the popularization of the application of network information in education, colleges, and universities are increasingly demanding to realize the modernization of teaching, so it is imperative to use computers to realize the management of online teaching. The development of information technology has brought a revolutionary impact on education. Online teaching has become an important teaching method. With the development of web technology, relevant learners can easily use multimedia network technology to build such an ideal learning environment. Web technology is not only an auxiliary tool but also a basic knowledge carrier, teaching media, and communication tool. For students and teachers, using computers to realize online teaching is a necessary condition for adapting to the requirements of the modern education system and promoting scientific and standardized teaching [1].

Different courses have different teaching modes and different teaching methods, and different students' acceptance of knowledge is also different. In the past, a teacher and dozens of students studied together in a large classroom, and the class hours were fixed, which may lead to students cannot fully digest the lessons taught by the teacher in class and teachers cannot do a timely review after class, which may lead to the negative consequences of student weariness [2]. Facing the current situation, there is an urgent need to develop a new, real-time platform to solve these problems. The emergence of online education platforms has become the best vehicle to solve these problems. Students can check the learning materials they need at any time through the Internet and consult teachers or have online discussions with classmates for learning problems anytime and anywhere so that problems can be solved in time [3].

With the continuous development of China's economy, culture, science, and technology, society has put forward higher requirements on college students' English level, and the reform of college English teaching has become one of the hot topics of social concern. English teaching reform and making full use of the web will change the past passive classroom teaching, teaching model of one-way infusion, and closed and enable it to active, two-way communication, open teaching mode, the resulting teaching materials, teaching methods and means, the effect of classroom

atmosphere, classroom teaching and social relations, and a similar series of innovations. The realization of this series of innovations is the perfect combination of the innovation of educational ideas, concepts, methods, means, modes, and technological progress [4]. With the continuous enrollment expansion of colleges and universities and the increase of the number of students, the teaching pressure of teachers is increasing. Often, the teaching method of large classes brings some adverse factors to ensure the teaching effect. As a basic course, English class is a very difficult task to help students answer questions and correct homework. The repetition rate of questions raised by different students is very high, but teachers need to answer one to one. Teachers have to face a lot of homework to correct every week, and most of these jobs are simple and repetitive work, which will take up a lot of valuable time of teachers and students. In order to ensure the quality of teaching and improve efficiency and liberate teachers, let them organize teaching better and create an online English education platform, publish teachers' teaching content on the Internet, solve common problems, and provide a convenient environment for discussion and communication between teachers and students.

Yan [5] designed an online English education platform based on small programs, mainly studied the design of online English learning small programs and the implementation of background management programs, completed the online playback of foreign teachers' voices, the corresponding text viewing, etc., through PHP + MySQL implements front-end user functions such as course purchases and small programs for back-end management functions such as course content list, WeChat member user management, audio upload, and course unlocking. However, it is found in practical application that the platform has a long response time. Reference [6] design an online English education platform based on the FBM. Through the analysis of the current status of online education platforms and online learning behavior characteristics of online learning users, combined with quantitative and qualitative analysis such as user questionnaires, interviews, and surveys, and according to the user journey map of online learners, the problems of the online learning experience of users in online education platforms are summarized. Coupled with the FBM behavior model proposed by Stanford University's Behavioral Science Professor Fogg, the model conducts interaction design from three aspects: increasing user incentives, increasing user capacity, and increasing trigger mechanisms, and the ideal application effect has a large gap. Reference [7] designed an online learning platform based on mobile Internet. Based on the design and analysis of the overall structure, functions, and execution process of the online learning system, the key technology of Android development, database design, and personalized recommendation algorithm are emphatically studied. On this basis, the system is implemented by using the Android platform and C/S structure, combined with the SQLite database. However, in the actual application, it is found that the platform has the problems of low user satisfaction and long response time, and the actual application effect is not good.

In order to solve the above-mentioned problems, this paper designs a new online English education platform based on the web and verifies the practical application effect of the platform through simulation experiments.

2. Online English Education Platform

2.1. Platform Hardware Design

2.1.1. Student Modules. Student module including teachers information consulting, courses available announcements, course learning, course information consult, course assignments and BBS discussion, teaching video review, personal Settings, registration, information query, interactive online grammar teaching, online discussion, and student module work process is shown in Figure 1.

Firstly, students submit their registration requests to the platform. Secondly, the administrator can view the user registration request in the module and judge whether it is authorized according to the registration information submitted by the student. If authorized, the last student will be sent after receiving the student email notification. After you log in successfully, you can log in with the application account and password. On the platform, students need to start course learning, and then enter the course learning environment to learn. Students can access the course bulletin board to view the latest announcements issued by the teacher of the course; open courseware and conduct online course study. The students can go to the course assignments section, select the assignments that the teacher has posted, do them online or download them, and then submit them. The students can also choose a test paper for online testing; if they encounter problems, they can enter the online discussion and directly communicate with other students or teachers. They can also post their problems in the course forum, discuss common problems with other students, and set their own personal password. Information about courses, assignments, tests, and grades can also be searched.

2.1.2. Teacher Module. Teacher module functions include teaching application, course announcement, course file maintenance, course preview: preview their own taught courses, course Q&A, course question bank management, course work, personal setting, registration application, information query, homework query, test paper management, and video resources. The workflow of the teacher module is shown in Figure 2.

From the analysis of the figure above, it can be seen that firstly, teachers submit registration requests to the platform, and secondly, administrators can view the registration requests of users and decide whether to grant authorization according to the registration information submitted by teachers. If authorized, a notice will be sent to the teacher's e-mail. After receiving the notice, the teacher can log in to the platform with his/her own account and password [8]. The procedure is the same as when a student submits an application. After the successful login, the first thing the teacher needs to do is to choose the course to teach. If it is the first time for the teacher to use the course,

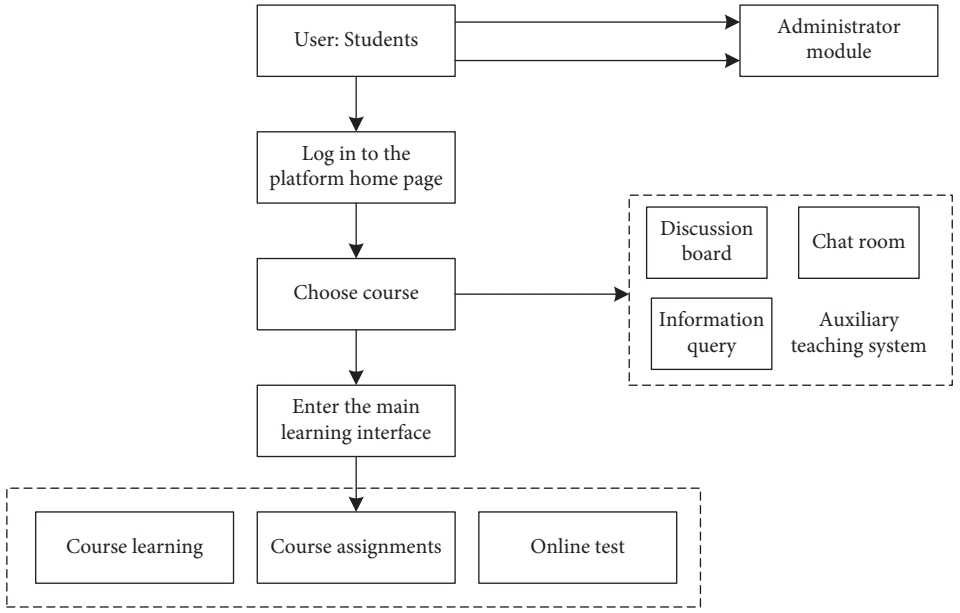

Figure 1: Workflow of student module.

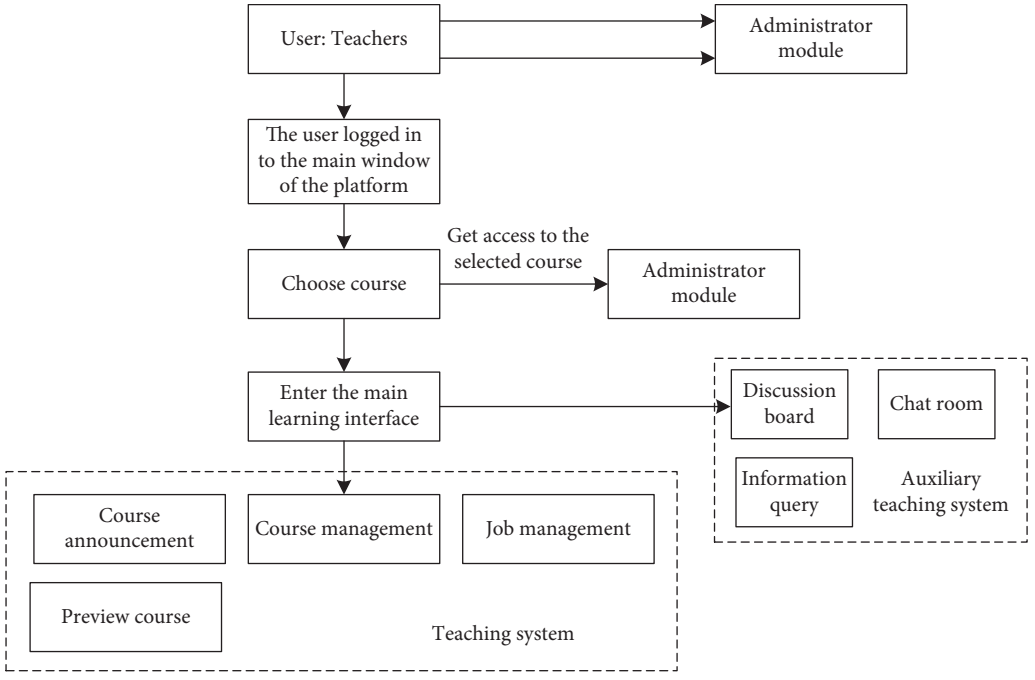

Figure 2: Workflow of teacher module.

he/she needs to apply to open the course and fill in some information about the course before completing the application. By entering the course maintenance module, teachers can directly maintain the course files; upload, download, and delete files; or upload a compressed package and decompress it [9]. They can also set the first file executed in the hypertext courseware and can browse their own courses, through the entry of the question bank maintenance module and the establishment and modification of the course question bank. They can maintain the homework library, correct the homework online, respond to students' questions, manage the articles in the course forum, and discuss with them. They can also set up their own personal password and find out about courses, assignments, tests, and grades.

2.1.3. Administrator Module. Administrator module functions include student management, announcement management, administrator management, teacher management,

course library management, test paper library management, question bank management, interactive plug-in management, professional information management, test score management, homework score management, and information query. The administrator module workflow is shown in Figure 3.

The administrator can log in to the platform management module, manage students, teachers, and administrators by entering the user management, add and delete users, and authorize the registration application of students or teachers. Through the announcement management module, the administrator can publish, modify, and delete the announcement and can view or delete the announcement of all courses. Through the course management module, the administrator can authorize the teacher's course application or delete a course from the system [10]. Through the basic table management module, the administrator can maintain the basic table of the platform through the question bank, job bank, test paper bank management respectively to the question bank, job bank, and test paper bank to maintain.

2.1.4. Database Module. Various kinds of data need to be stored and managed in the database of a web-based online English education platform. Database design also affects the design of the online English education platform, a lot of data according to certain organizations together in the database; the database not only can provide storage and maintenance functions but also can provide retrieval data function so that the platform can be more accurately extract the needed information and more convenient than the original more timely, [11]. Therefore, the development and operation of online English education platform are directly affected by the database; database design is a very important aspect of the online English education platform development and design.

Based on the analysis of entities, the relationship between the tables in the database is formed. According to the corresponding relational model, the physical design of the database is carried out, and the data design software Power Designer 10.0 is used for the physical structure design of the database [12]. The database table of online English education platform will be designed according to Table 1.

2.2. Platform Software Design. On this basis, the *K*-means clustering method is used to cluster the learner data in the web, to determine their English level, and the collaborative filtering algorithm is combined to recommend relevant course materials for learners so as to complete the platform software design.

2.2.1. Classification of Student Grades Based on K-Means Clustering. Clustering is to find out the similarities between some data from a large number of data and gather these familiar data together. This process is usually called clustering. The data objects in one cluster have similar characteristics, but the data objects in different clusters have no correlation with each other. The purpose of clustering is to classify and study data objects, find out the characteristics of a group of objects, and draw research rules or conclusions without studying each object individually so as to save research manpower or material resources. In education, cluster analysis of learners is usually used to distinguish different learning groups, outline the basic characteristics of each group, reveal the characteristics of each group, conduct in-depth analysis of each group, arrange personalized curriculum, implement personalized education, and improve the learning efficiency of each group [13]. There are many kinds of clustering algorithms, which can be roughly divided into a split clustering algorithm, hierarchical clustering algorithm, density-based clustering algorithm, mesh-based clustering algorithm, and so on. The algorithm adopted in this paper is one of the split clustering algorithms: *K*-means clustering algorithm. The core idea of the K-means clustering algorithm is K, given the number of clusters in advance, find K data objects as the initial cluster centers, calculate other centers that enter the data cluster through a certain method, calculate the average value of each cluster, and then change to the cluster center value until the cluster center gets fixed. [14].

In this paper, *K*-means clustering algorithm is adopted to cluster learners on the English online education platform, scientifically determine their English level, and then arrange appropriate learning content for them combined with the collaborative filtering method. Before students study, they have to take a proficiency test, which includes five parts: listening score, speaking score, reading score, writing score, and total score.

Common European Framework of Reference for Languages (CEFR) was developed by the Council of Europe and consists of six levels, which are currently used as a reference standard in the field of language learning and teaching. Each level represents the level that a student should achieve. This classification standard is adopted in the English online education platform studied in this paper [15]. The six grades are $A1$, $A2$, $B1$, $B2$, $C1$, and $C2$. Table 2 describes the language proficiency required for each level [16].

(1) Data Collection. On most English online education platforms, students take a proficiency test to determine their current English level before the formal study. In the process of *K*-means clustering, a certain number of students' level test data were randomly selected from the database of the English online education platform in the study. The level test data were divided into four modules, namely listening, speaking, reading, and writing, and the score of each module was calculated on a scale of 100. At the same time, the basic data of these students should be selected as the analysis basis of cluster mining results, including age, gender, occupation, position, and study reasons. The sample of students should be limited according to the purpose of the study. Since this paper mainly studies online learning, the learning objects are all adults. The age limit of the selected research objects is 18 years or above. The ranges of occupations, positions, and study reasons are all based on the classification criteria in the selected cases.

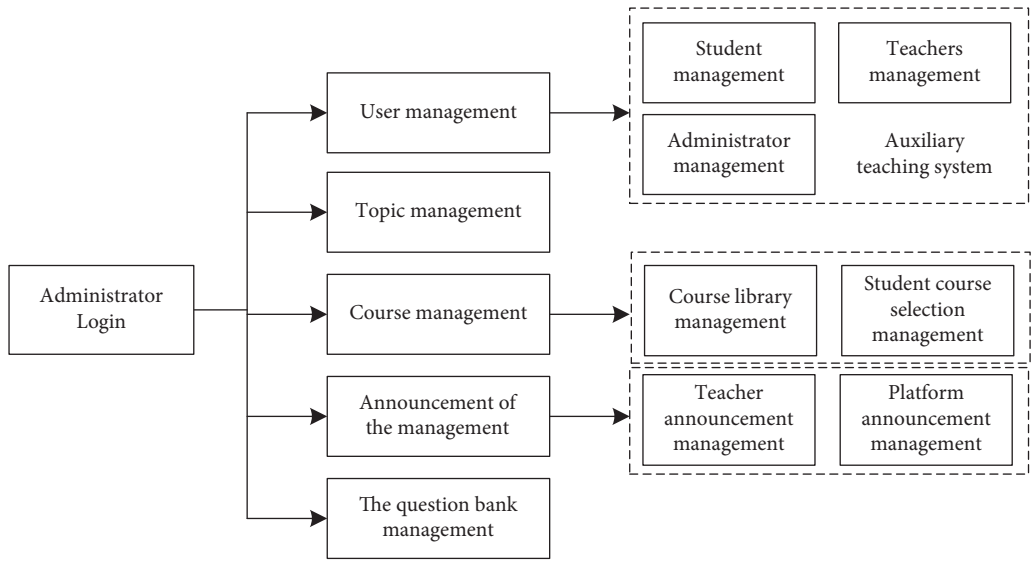

Figure 3: Administrator module workflow.

Table 1: Overall design table of database physical structure.

The name of the table	Instructions
Users	This table stores administrator and teacher information
Student info	This table stores basic information about students
Exam manage	This table holds information about each test schedule
Subject info	This table stores course information for each major
Paper manage	This table holds information about each test
Score manage	This table holds information about students' scores for each test
Single questions	This table holds all the multiple-choice information
Mul questions	This table holds all the multiple-choice information
YN questions	This table holds all true or false information
Fill questions	This table holds information about all the fill-in-the-blank questions

YN: yes or no.

Table 2: Six levels of CEFR.

Level	Ability to describe
*A*1 (initiation and discovery stage)	Students can understand and use popular and commonly used phrases to make simple statements to meet specific requirements. Students are able to introduce themselves, introduce a person, and ask a person questions about that person where they live, their relationships, and what they own.
*A*2 (intermediate and continuation)	Students can understand individual sentences and common phrases that describe simple activities personal and family information, shopping, familiar environment, and work. Students are able to carry out simple and direct information exchange on familiar and habitual content while completing simple and habitual tasks.
*B*1 (entry stage)	Students can understand the general meaning when the other person speaks clearly and in standard terms and when the speech is about familiar topics such as work, study, and hobbies. Students are able to describe an event, describe a desire or goal, and give short reasons for, or explain, a plan or idea.
*B*2 (advanced or independent stage)	Students are able to understand the main points of a complex text, both concrete and abstract, and to discuss their own areas of expertise. Students are able to express their views clearly and in detail on a wide range of topics, present opinions on current issues, and express the benefits and disadvantages of something.
*C*1 (autonomous stage)	Students can understand many articles with long and large vocabularies and understand the hidden meanings. Students are able to express their ideas freely and fluently without struggling to find the right words to use. Students are able to articulate their ideas on complex topics in a clear and well-organized manner, speaking in a well-organized, articulating, and coherent manner.
*C*2 (mastery stage)	Students can understand almost everything they read or hear without struggling. Students are able to make organized summaries of a variety of information from written or oral sources. Students can express their opinions freely, fluently and accurately, and can use different levels of words to express themselves.

The flowchart of applying *K*-means clustering in the English online education platform is shown in Figure 4.

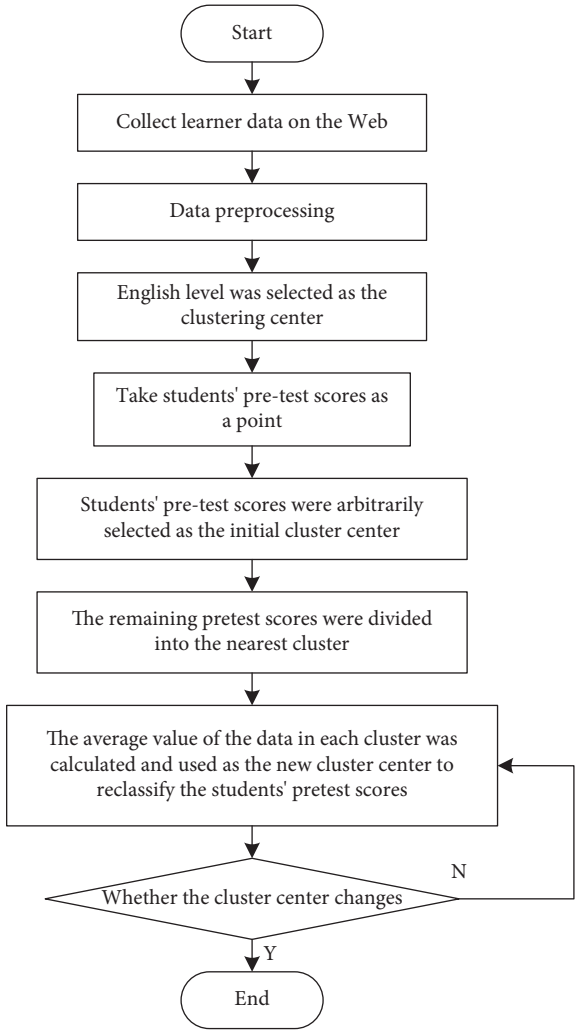

Figure 4: Flowchart of K-means clustering.

(2) Data Preprocessing. After obtaining the data of learners' level test, the next step is to preprocess the data, make its format meet the requirements of the clustering algorithm, and then store it. The data used for K-means clustering in this paper are the scores of listening, speaking, reading, and writing sections of students' proficiency tests, and these data will be counted according to the percentage system in the clustering analysis. In addition, according to the case studied, the English level must be divided into certain standards. English is divided into six levels, which are entry, elementary, intermediate, intermediate, advanced, and proficient levels. English proficiency is the number of cluster categories, and the cluster category a student belongs to is the level of English proficiency [17].

(3) Analysis of Clustering Results. According to the clustering results of the previous step, the clustering analysis is carried out on the learners, the English level of the learners is determined, and the learning content suitable for their own level is arranged for them so that the learning effect will be relatively significant [18]. In addition, the clustering results can also be applied in the organization of learning content, combining with the basic situation of learners to organize personalized learning content for them. After clustering learners, it can also help teachers arrange students' oral classes or other teaching activities [19].

2.2.2. Course Recommendation Based on Collaborative Filtering Algorithm. Based on users' learning records, this paper analyzes the similarity between users and evaluates users' interest preference for unlearned courses according to similar users' learning conditions [20]. The similarity between users will be calculated according to the user-item matrix. The similarity calculation formula of user u and user v is as follows:

$$\operatorname{sim}(u, v) = \frac{r_u r_v'}{\sqrt{(r_u r_u')(r_v r_v')}}, \tag{1}$$

where r_u and r_v, respectively, represent two users' rating vectors for all items and r_v' and r_u', respectively, represent the transpose matrix of two rating vectors for similarity calculation [21].

In this paper, the nearest neighbor recommendation algorithm based on users is mainly used, that is, the scores of users and items are predicted according to the scores of the K users most similar to the target users [22]. The similarity calculation uses cosine similarity, and the size of K values will be determined through experiments. After the similarity between two users is obtained, the collaborative filtering preference value of user u for course i is defined as follows, and the final result is obtained by weighting the scores and similarity of the K users. The specific calculation formula is as follows:

$$\operatorname{pref}_{\mathrm{CF}} = \frac{\sum_{v=1}^{K} \operatorname{sim}(u, v) \cdot r(u, v)}{\sum_{v=1}^{K} \operatorname{sim}(u, v)}, \tag{2}$$

where $r(u, v)$ represents user u's rating of course i.

By calculating the similarity between the user feature vector and the course feature vector, the preferences of users to courses can be obtained. We define the feature vectors of users and the theme-based user preferences as follows:

$$\begin{aligned} \theta_u &= \frac{1}{u} \sum_{i=1}^{n} \theta_i, \\ \operatorname{pref}_{\mathrm{LDA}} &= \frac{\theta_u \theta_i'}{\sqrt{(\theta_u \theta_u')(\theta_i \theta_i')}}, \end{aligned} \tag{3}$$

where θ_i represents the feature vector of course i; when calculating the user's feature vector θ_u, n represents the number of courses that the user has learned [23].

The popularity characteristics of a course are calculated by taking into account the number of students studying the course, the number of users who rate it, and the number of students who rate it. In the cloud classroom data, general courses are rated on a scale of 1 to 5. Assuming that c_i represents the number of students in course i, s_i represents the number of students marking course i, and d_i represents the average score of course i, the course popularity can be calculated as follows:

$$\text{var}_{\text{HOT}}(u,i) = c_i + s_i \cdot d_i. \quad (4)$$

Since the absolute value of the popularity of courses is not of practical significance, but the relative value between courses is more important; after calculating the popularity of each course, it is necessary to rank the scores from highest to lowest [24]. Because the number of students in courses under different classifications varies greatly, it is of little significance to sort all courses in the data set, so the sorting is carried out separately for courses under each secondary classification [25]. After the sorted list is obtained, the following formula is used to calculate the final course popularity eigenvalue to be used:

$$\text{pref}_{\text{HOT}}(u,i) = 1 - \frac{R_i}{N}. \quad (5)$$

where N represents the total number of courses in the corresponding category, R_i represents the ranking of course i, and the course with R_i as 1 is the course with the highest value, that is, the most popular course in this category. After this calculation, the course popularity eigenvalues in the range of 0 to 1 can be obtained [20].

Due to the lack of personal information of course lecturers, it is impossible to make a good judgment on their influence [26]. However, lecturers have rich data in their course records. Therefore, this paper will quantify the influence of lecturers mainly according to the popularity of their courses. The lecturer impact factor is defined as follows:

$$\text{pref}_{\text{TEACH}}(u,i) = C \cdot \frac{1}{n} \sum_{k=1}^{n} \text{pref}_{\text{HOT}}(u,i), \quad (6)$$

where n for the total number of other courses i; course instructor name C is about the relationship between the user and the lecturer. The relationship between users and mentors is usually the degree of attention, of course, there are not three types. The three relationships reflect the trust of potential users to the mentor, so we also divide the value of the coefficient C into different levels (2.0, 1.5, 1.0).

The above four features influencing recommendation results are summarized from the original data, and they are extracted quantitatively. Next, the ranking function will be used to integrate these features and calculate the predicted score of user u to course i. The calculation method is to carry out a weighted linear combination of these features. In this paper, the weight calculation of the combination function is modeled as a ranking learning problem. In the course recommendation problem, there are only two relationships between users and the course: learning and not learning. For this binary scoring problem, the ranking SVM method is used to carry out the ranking learning [27].

For a given user and object, each pair of relationships will be represented as a vector x in which each dimension corresponds to different extracted features, and the dimension of the vector is the number of features [28]. The sorting function $f(x) = wx$ and w is the weight vector, which is also the parameter to be trained. In the model training stage, according to the user's learning situation of the course in the training data, the two courses are combined into item pairs. The representation of the i-th group of data in the training set is as follows:

$$\left(x_i^{(1)} - x_i^{(2)}, y_i\right), \quad i = 1, 2, \ldots, n. \quad (7)$$

Each set of data in the training set is for the same user, where n is the number of samples in the training set. The value of marking value y_i of the training sample includes +1 and −1. For two items $x^{(1)}$ and $x^{(2)}$, the difference of their eigenvectors will be used to mark the samples. If the user has studied course 1 but not course 2, it can be assumed that course 1 should precede course 2 in the sorted list, so $x^{(1)} - x^{(2)}$ is marked as a positive sample and $x^{(2)} - x^{(1)}$ as a negative sample. In the same way, all the courses learned by the users in the training sample are grouped with the courses not learned. If the user has learned or not learned the two courses, the training sample will be ignored because the ordering relationship cannot be judged [29].

After marking the training samples, the SVM model was used to conduct sorting training on them, and its loss function was set as follows:

$$L(i) = \min \sum_{i=1}^{n} \max\left(1 - \omega^T\left(x_i^{(1)} - x_i^{(2)}\right), 0\right) + \frac{1}{2}\|\omega\|^2. \quad (8)$$

After learning and training the sorting function, the model can be used to get the sorting situation of the list of courses to be recommended, and then the courses with the highest ranking can be selected and recommended to users.

3. Application Test and Analysis

In order to verify the practical application effect of the web-based online English education platform designed in this paper, the application test is carried out.

3.1. Application Effect Test. The platform is deployed on an IBM System X3200 M2 (CPU: Intel Xeon 2.83 GHz, DDR2 2 GB), Microsoft Windows Server 2003. Microsoft's stress test software was used to simulate 6000 users to stress test the main page of the platform, and the main performance indicators of the monitoring server are shown in Table 3.

The functional test results are shown in Table 4.

The main areas for security testing of the platform are: you must log in with a valid user name and password, and there is no background page that can be directly viewed without login. The user name and password are sensitive to uppercase and lowercase letters, and the user password is stored in ciphertext in the database. The platform has a login timeout limit. In other words, a user does not perform any operations within 15 minutes after logging in to the platform. In this way, resources can be saved. The platform has log files that can be traced.

From the perspective of the function of the platform, the platform correctly realizes the functional requirements of the demand analysis and can complete the course management, user management, teaching resources

Table 3: Main performance specifications and detection values of the server.

Counter	Minimum value	Maximum value	Average
%Processor time	3.9%	2.%	11.6%
Memory available MBytes	1287	1296	1291
Requests current	212	687	411
Request execute time	0	15 ms	2 ms
Request wait time	0	0	0
Request queued	0	0	0

Table 4: Functional test results.

Test the name	The test content	The test results	Conclusion
User authentication	Log in as administrator, teacher, and student respectively. Different identities can access the corresponding operation page.	Can fully verify the registered users, accurately judge the permission, and enter the corresponding operation page.	Implement design functions
File upload and browse	Upload picture information and can query and browse.	Multiple formats of files can be uploaded. By querying the filter, you can view the information about the uploaded portfolio according to the user permission.	Implement design functions
Homework upload and browse	Teachers and students log in, teachers upload, and students browse.	Teachers publish homework; students view and download	Implement design functions
Student testing module	Students log in to test; the platform can automatically set questions.	The platform can automatically set questions.	Implement design functions

Table 5: Satisfaction test results.

Grouping situation	Education platform based on small program	Education platform based on FBM behavior model	Education platform based on web
Group 1	6.6	7.5	9.6
Group 2	6.1	7.8	9.5
Group 3	5.9	8.2	9.4
Group 4	6.3	8.6	9.2
Group 5	6.8	8.4	9.4
Group 6	5.9	7.1	9.3
Group 7	6.4	7.1	9.1
Group 8	6.1	7.5	9.7
Group 9	5.5	8.2	9.3
Group 10	6.9	8.3	9.1
Average	6.3	7.9	9.4

management, homework management and online testing, and other functions. From the use of the platform, the existing platform interface is beautiful; the operation is simple; and the consistency of query, delete, and modify operation-related prompt information and the correctness, understandability, and consistency of input limit prompt information is realized. From the perspective of platform security, security issues under the control of the existing platform, without logging in, directly entering the URL of a page cannot open the corresponding page, indicating that the platform is safe and stable, and can effectively assist English teaching through the network. This can improve teaching efficiency and effectively reduce the economic burden of teachers.

3.2. Comparison Test. The education platform based on a small program, the education platform based on the FBM behavior model, and the education platform based on the web are taken as the experimental platforms, and the user satisfaction and response time of different platforms are tested as the evaluation indicators.

A total of 1,000 volunteers were selected as the experimental subjects. They logged in to different online English education platforms as administrators, teachers, and students and conducted functional tests. The corresponding test scores were given, with the highest score being 10 and the lowest score being 0. The valid evaluation results are divided into 10 groups, and the user satisfaction test results of the three platforms are shown in Table 5.

According to the data in Table 5, the average user satisfaction of the education platform based on a small program is 6.3, which is the lowest among the three platforms. The average user satisfaction of the education platform based on the FBM behavior model is 7.9, and that of the education platform based on the web is 9.4, which is the highest among the three platforms. It shows that the platform is more popular and recognized by users.

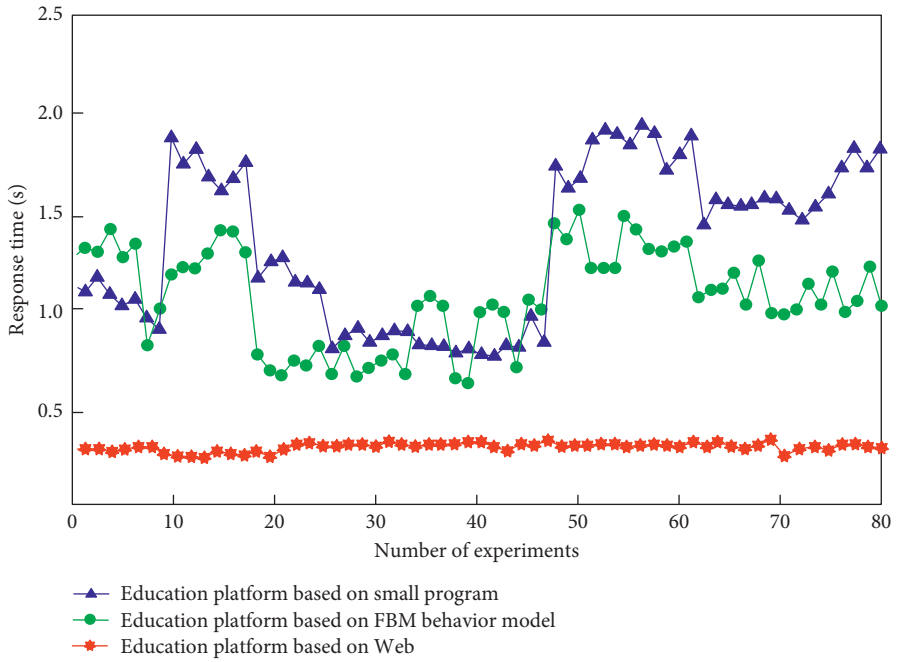

Figure 5: Response time comparison results.

On the basis of the above, the response time of the education platform based on a small program, the education platform based on the FBM behavior model, and the education platform based on the web is compared. The specific comparison results are shown in Figure 5.

By analyzing the data in Figure 5, it can be seen that the response time of the education platform based on small program varies between 0.6 s and 1.6 s; the response time of the education platform based on the FBM behavior model varies between 0.8 s and 2.9 s; and the response time of the education platform based on the web is always below 0.4 s, indicating that the response speed of the platform designed in this paper is faster. The practical application results are better.

4. Conclusion

With the rapid development of the Internet, people pay more and more attention to various applications based on the Internet. In the field of education, traditional teaching methods have changed dramatically. The modern education mode under the web environment appeared. Computer-aided instruction (CAI) is a new educational technology. With the development of educational reform and the advancement of social information, it is required to popularize CAI vigorously. Online English education platform has broken the time and space limit and regional limit of traditional education and can make full use of educational resources. Therefore, the online English education platform has become an important practical content and one of the research directions of educational informatization, and it is also an important and urgent subject to promote the process of educational informatization. Therefore, increasing web-based teaching and developing various kinds of information teaching software have become an increasing concern of educators. Therefore, this paper developed a web-based online English education platform. The practical application results show that the platform has better functions and security, and compared with traditional platforms, with high user satisfaction and short response time, the platform can fully solve the problems existing in the traditional platform, and the practical application effect is better.

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 known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

No funding was used in this study.

References

[1] L. A. Zhi, "Simulation of English education translation platform based on web remote embedded platform and 5G network-ScienceDirect," *Microprocessors and Microsystems*, vol. 81, no. 1, pp. 1–12, 2020.

[2] Z. Sun, M. Anbarasan, and D. P. Kumar, "Design of online intelligent English teaching platform based on artificial intelligence techniques," *Computational Intelligence*, vol. 86, no. 2, pp. 235–246, 2020.

[3] H. Chen, "The influence of online English writing platform on writing metacognitive strategies and writing

performance——a study based on English majors in vocational colleges," *Journal of Shaanxi Institute of Education*, vol. 035, no. 003, pp. 97–100, 2019.

[4] L. U. Xiao and B. E. Fa, "Designing higher vocational college English blended learning mode based on wechat platform," *Overseas English*, vol. 12, no. 2, pp. 266–277, 2019.

[5] X. U. Yan, "Research and design of online English learning platform for children based on small programs," *Computer Engineering & Software*, vol. 21, no. 5, pp. 249–252, 2019.

[6] Z. Tan and X. Jiang, "Interaction design of E-learning platform based on the Fogg's behavior model," *Packaging Engineering*, vol. 41, no. 4, pp. 189–194, 2020.

[7] X. J. Chen and C. J. Song, "Research and design of online learning platform based on mobile Internet," *Microcomputer Applications*, vol. 35, no. 1, pp. 35–38, 2019.

[8] D. Sydow, M. Wichmann, J. Rodríguez-Guerra, D. Goldmann, G. Landrum, and A. Volkamer, "TeachOpenCADD-KNIME: a teaching platform for computer-aided drug design using KNIME workflows," *Journal of Chemical Information and Modeling*, vol. 15, no. 2, pp. 68–73, 2019.

[9] Q. Hui, "Research on the design of the innovative teaching platform for college English linguistics based on network technologies," *Research on International English Education*, vol. 18, no. 3, pp. 58–62, 2019.

[10] X. Ning, "Design of online popular music teaching platform based on embedded computer network and virtual reality," *Journal of Ambient Intelligence and Humanized Computing*, vol. 58, no. 6, pp. 1–11, 2021.

[11] L. B. Ayres, F. S. Lopes, C. D. Garcia, and I. G. R. Gutz, "Integrated instrumental analysis teaching platform with smartphone-operated fluorometer," *Analytical Methods*, vol. 12, no. 1, pp. 4109–4115, 2020.

[12] A. Xw and C. B. Yao, "Music teaching platform based on FPGA and neural network," *Microprocessors and Microsystems*, vol. 80, no. 1, pp. 10–21, 2020.

[13] M. F. Toyne, J. E. Briley, and T. Jalbert, "Comparing learning outcomes on face-to-face and online teaching platforms: evidence from major field test scores," *Business Education and Accreditation*, vol. 11, no. 1, pp. 61–69, 2019.

[14] Y. Dejie, Z. Ning, and Y. Ji, "Individual credit risk assessment based on stacked denoising autoencoder networks," *Computer Science*, vol. 46, no. 10, pp. 7–13, 2019.

[15] A. Kalimashi, Y. Ahmeti, and A. Ahmeti, "The impact of audited financial statements on credit risk assessment in the banking system of Kosovo (Period 2014–2018)," *Baltic Journal of Real Estate Economics and Construction Management*, vol. 8, no. 1, pp. 119–128, 2020.

[16] A. Onan, "Consensus clustering-based undersampling approach to imbalanced learning," *Scientific Programming*, vol. 201914 pages, 2019.

[17] A. Onan, S. Korukoğlu, and H. Bulut, "A multiobjective weighted voting ensemble classifier based on differential evolution algorithm for text sentiment classification," *Expert Systems with Applications*, vol. 62, pp. 1–16, 2016.

[18] A. Onan and S. Korukoğlu, "A feature selection model based on genetic rank aggregation for text sentiment classification," *Journal of Information Science*, vol. 43, no. 1, pp. 25–38, 2017.

[19] A. Onan, "Sentiment analysis on product reviews based on weighted word embeddings and deep neural networks," *Concurrency and Computation: Practice and Experience*, Article ID e5909, 2018.

[20] A. Onan and M. A. Tocoglu, "A term weighted neural language model and stacked bidirectional LSTM based framework for sarcasm identification," *IEEE Access*, vol. 9, pp. 7701–7722, 2021.

[21] A. Onan, "text mining and deep learning approach," *Computer Applications in Engineering Education*, vol. 29, no. 3, pp. 572–589, 2021.

[22] A. Onan and S. Korukoğlu, "Exploring performance of instance selection methods in text sentiment classification," in *Proceedings of the Artificial Intelligence Perspectives in Intelligent Systems*, pp. 167–179, Springer, Cham, 2016.

[23] L. Ying, Z. Lijuan, and H. Yanan, "Financial credit risk evaluation model of supply chain finance based on particle swarm cooperative optimization algorithm," *Journal of Jilin University (Science Edition)*, vol. 56, no. 1, pp. 119–125, 2018.

[24] A. Onan, "Topic-enriched word embeddings for sarcasm identification," in *Proceedings of the Computer Science On-Line Conference*, pp. 293–304, Springer, Cham, 2019.

[25] A. Onan, S. Korukoğlu, and H. Bulut, "Ensemble of keyword extraction methods and classifiers in text classification," *Expert Systems with Applications*, vol. 57, pp. 232–247, 2016.

[26] A. Onan, "An ensemble scheme based on language function analysis and feature engineering for text genre classification," *Journal of Information Science*, vol. 44, no. 1, pp. 28–47, 2018.

[27] A. Onan and M. A. Tocoglu, "Satire identification in Turkish news articles based on ensemble of classifiers," *Turkish Journal of Electrical Engineering & Computer Sciences*, vol. 28, no. 2, pp. 1086–1106.

[28] A. Onan, "Hybrid supervised clustering based ensemble scheme for text classification," *Kybernetes*, vol. 46, no. 2, pp. 330–348, 2017.

[29] A. Onan, S. Korukoğlu, and H. Bulut, "A hybrid ensemble pruning approach based on consensus clustering and multi-objective evolutionary algorithm for sentiment classification," *Information Processing & Management*, vol. 53, no. 4, pp. 814–833, 2017.