

Research Article

Application of Key Technologies of College English Online Teaching Platform in Deep Learning

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With the rapid development of information technology, the network has become a part of the daily life of current college students. The use of network tools to develop college English teaching platform is necessary and beneficial. Various versions of online English teaching platforms have been developed in China and used by many Chinese universities. Through research and analysis, according to the theory of communicative learning, this paper puts forward the design plan of English university teaching platform for Chinese colleges and universities. The article first summarizes the research origin and importance of the college English online teaching platform. It then outlines the current situation of college English online teaching platforms and provides a demonstration of a specific platform for a specific teaching network. This article discusses the research on deep learning using advanced technology on college English teaching platforms. Through questionnaires, group discussions, in-depth interviews, classroom observations, and other research methods, we can understand the current situation of school computer networks from a macro perspective. It integrates foreign language courses and the problems teachers and students encounter in the process. The results show that 56% of the students said that this method can promote their own learning, and 12% of the students think that there will be no good learning effect. For this new test method, 86% of the teachers think that it can achieve a certain learning effect, which is a good similar to an adaptive test method.

1. Introduction

Advances in computer networks and multimedia technologies have profoundly changed all aspects of production and people's lives. One important aspect is the quiet change in the way we learn. Online learning is gradually becoming part of how people learn. It has gradually transitioned from the past learning method that purely relied on paper books to a multimedia learning method that uses Internet resources to obtain required resources. The rich educational resources of the Internet are increasingly influencing the way we learn. The convenient and fast features of the Internet are also very useful for most learners. The learning model based on web-based learning platforms has great power and potential. We often talk about e-learning platforms in broad and narrow terms. Strictly speaking, an e-learning platform means a computer network. It is a software system that provides learners with extensive online services. In a broader sense, a

networked learning platform includes not only the software system, but also the hardware environment that supports the software system. With the deepening reform of English language teaching in higher education, curricula clearly show that colleges and universities should take full advantage of multimedia networking technologies to accelerate the improvement of teaching methods. The English teaching is no longer limited by time and environment, and it develops towards individualized learning and autonomous learning. Therefore, it is essential and appropriate to create a self-learning platform for English in universities. A university English learning online platform can provide many rich tools for learning English and simulate various English listening and speaking exercises. It is mainly reflected in the following aspects: it has more vivid and interesting, bright text, images, animation, video, and other multimodal teaching content, which can stimulate students' interests and hobbies. This provides students with a more concise and

convenient language practice environment, eliminating the traditional trouble of listening to listening with CDs or tapes. It largely compensates for the shortcomings of traditional learning methods, which tend to be more “learner-centered.” The relationship between teachers and learners in traditional teaching is changing. Learners are transformed from passive recipients of knowledge into subjects of the learning process. This creates a whole new relationship between “learning and teaching.” Students’ English language learning is no longer limited in time and space and resources can be shared.

Experts at home and abroad are working intensively on in-depth learning technologies and learning platforms in university networks. Mussig et al. [1] believe that, with well-structured e-learning platforms, video lectures, and laboratory exercises, students can conduct experiments at home. The evaluation results of this new concept of laboratory experiments show that students are very positive about this form of learning [1]. Menon et al. [2] believe that medical education across the country is being forced to shift to e-learning, especially to online courses. The medical education department (MED) of a university hospital felt the need to study the satisfaction with these courses and their usefulness [2]. Chen et al. [3] were the first to introduce the concept of deep learning for hyperspectral data classification. For the first time, they characterized stacked autoencoders with classical classification based on spectral information [3]. Kermany et al. [4] developed a diagnostic tool based on deep learning. They used it to examine patients with normal and treatable retinal diseases [4]. O’shea and Hoydis [5] presented and discussed several new applications of deep learning at the physical level. They interpreted the communication system as an automatic encoder and developed a completely new method to optimize the transmitter and receiver elements within a single process [5]. Ravi et al. [6] considered deep learning as a technology based on artificial neural networks. In recent years, it has become a powerful machine learning tool that is expected to change the future of artificial intelligence [6]. Alhassan [7] showed that the number of TESOL and applied linguistics researchers requiring international English language learning has increased over the past two decades [7]. Yusupova [8] emphasized the importance and purpose of communication and technology in the learning process and students’ communication skills in English language teaching [8]. Gozieva [9] focused on the use and practice of modern information technology in English language teaching in higher education [9]. Kolluru and Varughese [10] aim to promote active academic discussions and concept enrichment through an online platform designed for education to improve overall course performance [10]. A study by Steele et al. [11] aimed to compare the impact of interactive digital learning platforms and formal paper-based education on patients’ knowledge of ionizing radiation [11]. Chen et al. [3] proposed a new deep learning framework that combines these two features to achieve the best possible classification accuracy [3]. These methods provide some benchmarks for the research. However, due

to the short time and small sample size, this study has not been publicly acknowledged.

This paper summarizes the research history and significance of the whole online platform for English teaching in higher education institutions and then examines the existing problems of the existing online platform for English teaching in higher education institutions in detail. Based on this study, the functional and nonfunctional requirements of the online English teaching platform are described, and it is analyzed whether the online English teaching platform can be realized. Finally, a network platform system for English teaching in higher education institutions is designed and implemented. The system mainly includes six main modules: login module, basic management module, book verification module, teaching business module, statistical query module, and system setting. According to the identity of the users logging into the system, the whole system of the network platform for English teaching in higher education institutions is divided into four subsystems. They are superadministrator subsystem, school administrator subsystem, teacher subsystem, and student subsystem. Student users can log into the system to study network resources. They can ask questions to teachers at any time or communicate with other students in the learning forum. Teacher users can upload or download teaching resources, publish assignments to students by class, answer students’ doubts, assign students to classes, check the completion of students’ homework or statistics of students’ study time, etc. Admin (School Admin and Super-Admin) users can publish news announcements to students or teachers. The administrator imports the registration information of students or teachers, reviews the identities of those who log in to the platform, makes statistics, and checks the student’s learning and teachers’ work [12].

2. Automatically Generate Code Based on Bootstrap Interface

Code generation techniques based on template engine parsing usually consist of templates, tags, and template engines. The template engine is the soul of the code generation technology based on template engine parsing. It enables selective, purposeful filtering of template data. It allows developers to use a simple template language to refer to objects defined by C# code or data information in database tables to generate custom user interface. The process of using the NVelocity template engine to parse templates to generate interface code is shown in Figure 1 [13].

As can be seen from the figure, the main steps of interface code generation are as follows: it first compiles a page template and plans the layout of the interface in the template. It sets the CSS style and special labels of the interface and writes the corresponding JavaScript (JS) code, etc. It then adds a reference to the NVelocity template engine in the project, creating an NVelocity instance object. As for setting the path where the template code is stored, the general practice is to add a template folder to the project as the storage path for all templates. It then defines a

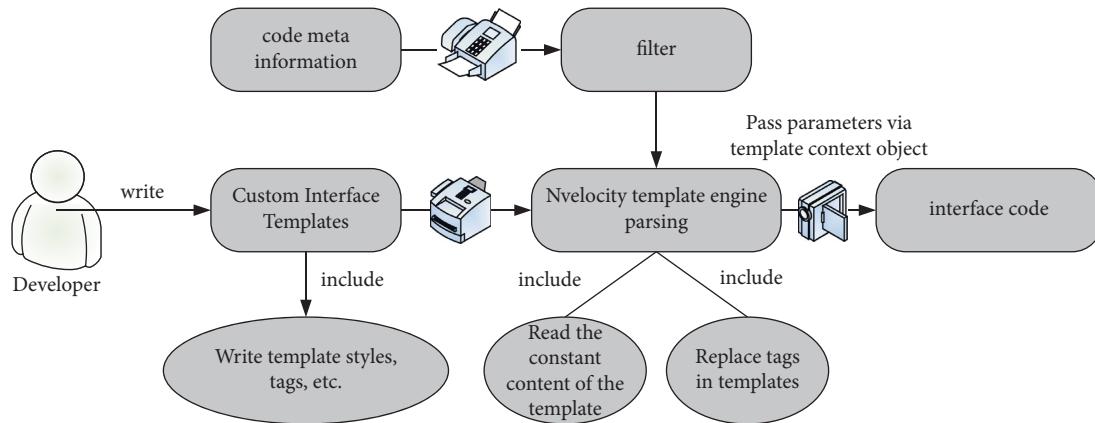


FIGURE 1: Schematic diagram of interface code generation.

template context object, passing in the parameters required for template parsing and replacement. The parameter passed in must be the value of the object property filtered by the filter. Finally, it replaces the variable content in the page template according to the parameter content in the context object of the template. It then merges the result of processing the variable part with the invariant part in the template and outputs the final interface code. The main function of the filter is to read the specified data in the metadata, such as class name, function name, member variable name, and type.

Static objects represent static content, such as interface layout, frame, icon color, and popup style. When the template is parsed, the static content basically does not change and is directly output to the target code. Dynamic objects represent parts of a template that are referred to by special tags. When the template is parsed, it is often replaced by the metadata of the incoming template. When designing the interface, the developer will divide the entire interface into multiple interface units. They then utilize each interface element to accomplish the task of the user interacting with the internal data objects. If the arrangement and layout of the controls are different, there will be differences in the display style of the interface. From the appearance point of view, the interface unit is formed by the arrangement and layout of various controls. The presentation style of the interface is the extension of the interface unit. From the analysis of the realization mechanism, the interface unit is the bridge between the database data and the user input. Changes to any interactive information on the interface are carried out through various logical operations. These logical operations are the extension performance of the interface unit. Generally speaking, if the design is based on the display style of the interface, the developer can roughly divide the entire Web interface into the following three parts: the data query interface unit, the logical operation interface unit, and the information list display interface unit. The data query interface unit mainly completes the information query. The logical operation interface unit mainly completes the interaction between user input information and background database information. For example, it adds,

deletes, modifies, and checks the data entered by the user. The information list display interface unit mainly uses the form of a list to display the data content stored in the database table. The flow of the editing function is shown in Figure 2 [14].

In order to solve the shortcomings of a single verification method, the article combines the advantages of two verification methods. It puts forward the idea of a double-authentication mode, which allows school administrators to choose the authentication method according to the different school network environment. Among them, because there are many online verification methods, after comparing the above several online verification methods, the web page verification method is finally selected. Although SMS verification and phone verification are slightly stronger than web verification in terms of security, the corresponding costs are also higher than web verification, especially phone verification, so they are rarely accepted by small- and medium-sized enterprises. Long-distance access is required for calls made by remote users. This method of payment, whether from the perspective of users or enterprises, is relatively expensive compared to other verification methods. As for e-mail verification, it costs the same as web verification. However, because it performs data verification by calling the third-party interface, it is often bound by various protocols of the third-party interface. And when verifying, the user must not only enter the verification code, but also enter the mailbox number and then log into the mailbox and click confirm. In terms of user experience, it increases the difficulty for users to use. The verification method of the improved book verification module is shown in Figure 3:

2.1. Training of Two-Channel Convolutional Neural Network Model. In order to overcome the structural defects of SCNN, the topology of the DCNN network in the forward and backward propagation processes is given here, as shown in Figure 4. The entire DCNN model includes cascaded building blocks as shown. A is the output feature and is the mapping matrix of each activation layer. δ is the error

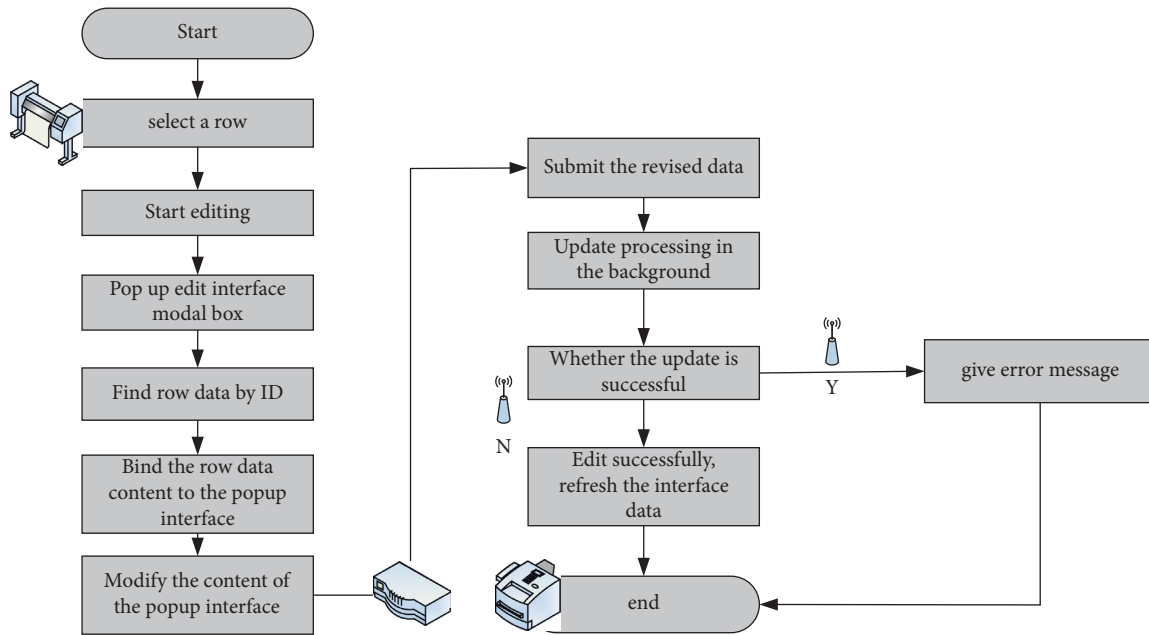


FIGURE 2: Flowchart of the editing function.

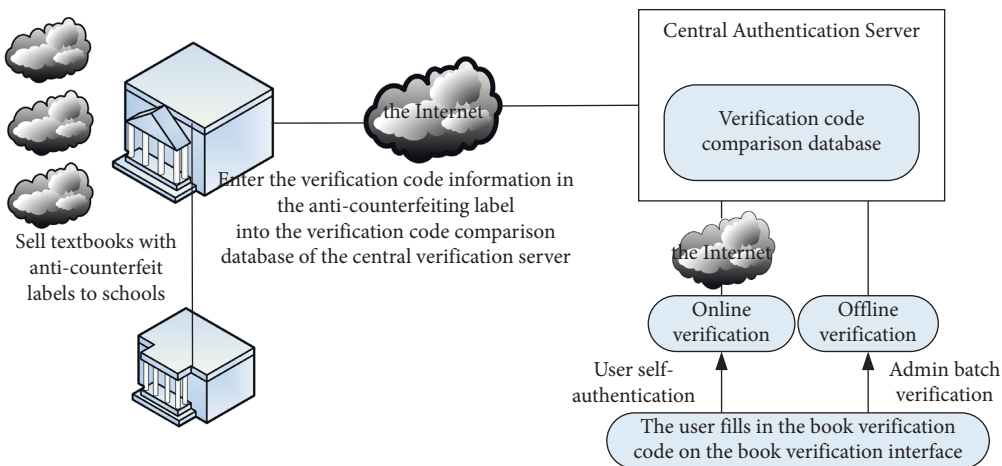


FIGURE 3: The verification method of the improved book verification module.

gradient returned by the propagation of this layer. “Dual channel,” as the name suggests, refers to a neural network consisting of two channels: a straight channel and a meandering channel. Compared with SCNN, DCNN can ensure that the deep neural network has a higher “tolerance” in structure. The “unobstructed” proposed here is aimed at two aspects. One is the deployment of forward data features, and the other is backpropagation training of network parameter gradients. The training process of DCNN is basically the same as that of SCNN. The main difference lies in the calculation of the weight gradient using the BP algorithm. The gradient formula of a single structural block is deduced below, and the gradient formulas of other structural blocks can be derived in the same way.

Code templates are an abstraction for object code generation. It determines the quality of the entire object code. A better way to write templates is to first write the

actual runnable code manually and then rewrite the code into template code on this basis. The following is an example of the editing function of the logic operation interface unit. A complete editing function is implemented as follows: when the “edit” event is triggered on the interface, the general practice is to click the “button” or “link sign” on the interface to trigger the event.

After triggering the edit event, the edit event mainly completes the following tasks: it captures the row ID of the row data whose information needs to be modified, because the modification operation is performed for the specified row. A modal box will pop up, and the information form of the popup modal box will contain the description information of some fields that exist in the actual database table. The displayed description information is the data filtered by certain filtering rules. The following is an example of feedback Table 1.

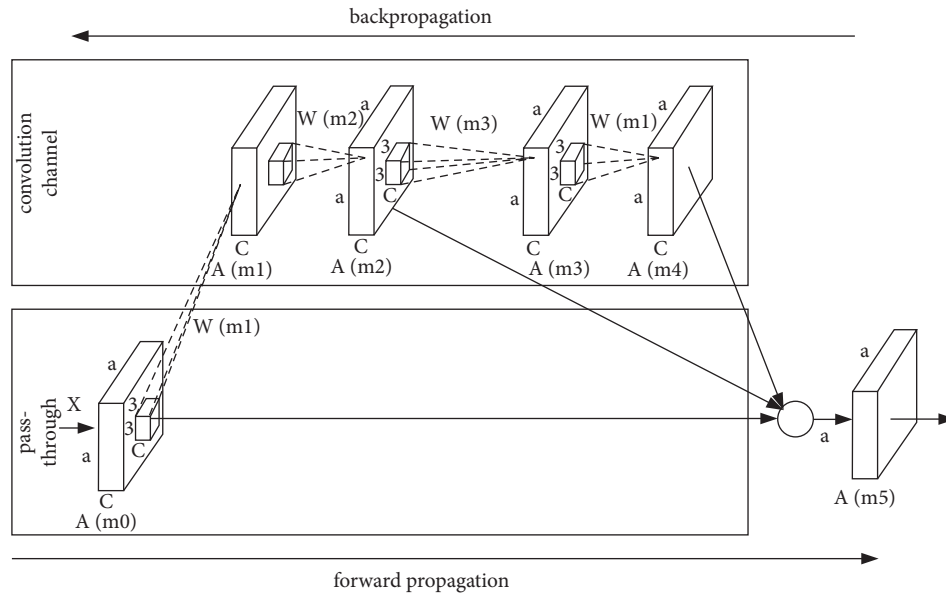


FIGURE 4: Training of DCNN.

TABLE 1: Feedback form.

Name	Type	Length	Primary key	Description	Parameter
ID	nvarchar	50	Yes	Comment number	1.2514
Title	nvarchar	Max	No	Title	2.3541
Feedback	nvarchar	Max	No	Feedback content	0.5132
TypeID	nvarchar	50	No	Feedback category	0.2361
UserID	int		No	User ID	1.3261
CreateTime	nvarchar		No	Creation time	2.3226

The login module of the system mainly includes two parts: the user’s self-registration function and the user’s login function. In this system, according to the different roles of users, the whole college English online learning platform can be divided into four subsystems. They are superadministrator subsystem, school administrator subsystem, teacher subsystem, and student subsystem. It enters different subsystems according to the different login user identities. In the login interface, the user first enters the username, and the system will automatically detect whether the username exists. If it exists, the system will prompt the username to exist after the input box. If the username does not exist, the system will automatically prompt the user to register first. Except for all administrators, other users who use the system need to register before they can log into the system. In the system, there are two ways to register new users. One is “administrator batch registration,” and the other is “user self-registration.” The login interface in the login module mainly provides the “user self-registration” function. As for “administrator batch registration,” it is done by the administrator in the user management module. The logic processing flow of the system login module program is as follows: the user enters the username in the input box of the login interface, and the system will automatically transmit the data to the processing function in the

background controller for verification. If the username exists in the database, the user will be prompted that the username already exists, and the user can continue to enter the password. If the username is detected as non-existent, the system will prompt the user to register first through the “Creating a new account” link. When the username exists, the system will automatically locate the mouse locator to the password input box. After the user enters the password, the processing function in the background controller will interact with the database by calling the processing function in the business logic layer. It queries the username and password information submitted by the front desk in the database and returns the query results in the form of Boolean variables. The foreground gives different prompts by judging the returned Boolean variable value. If the value is “true,” it will prompt that the login is successful and enter the home page of the corresponding subsystem. If the login fails, a “username or password error” prompt will be given. The software flow chart of user login is shown in Figure 5.

Figure 6 shows the real-time accuracy of the model in Table 2 during the training process, and it can be seen that the results are consistent. Moreover, the DCNN based on the decay factor proposed in the article also shows very strong robustness when dealing with different learning rates. This is all thanks to the decay factor optimization algorithm

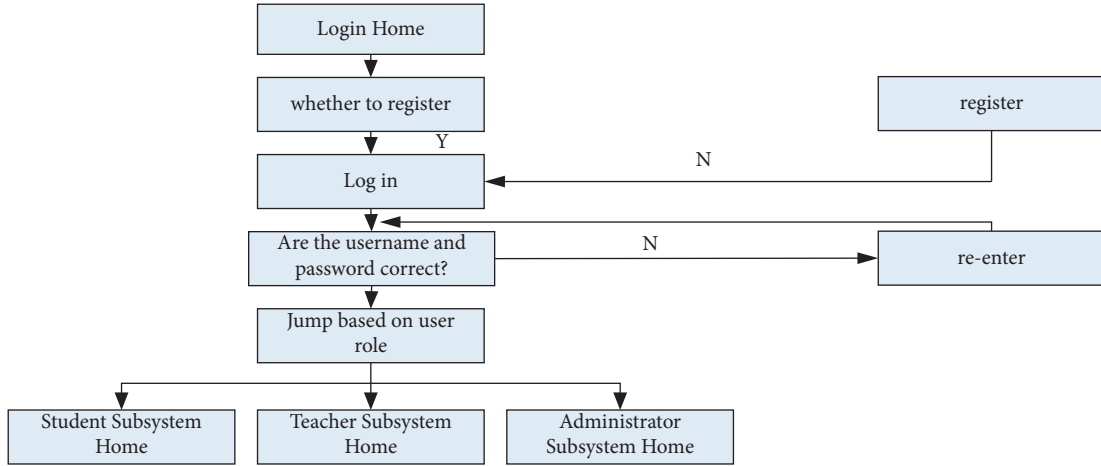


FIGURE 5: Software flow chart for user login.

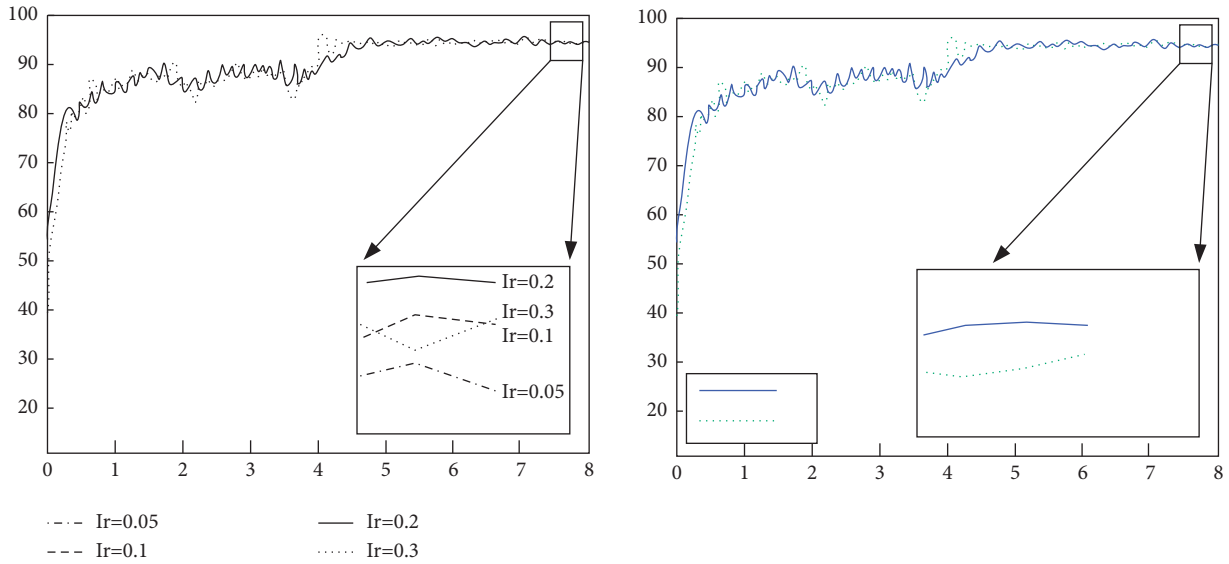


FIGURE 6: Model accuracy comparison for different pooling methods.

TABLE 2: Results for different initial learning rates.

Initial learning rate	Accuracy\%
0.05	93.72
0.1	94.40
0.2	94.53
0.3	94.26
0.4	Does not converge

proposed in the article. From the perspective of forward propagation, the convolution attenuation factor can attenuate the output data of the convolution channel. This makes the straight channel have a greater impact on the model output than the convolution channel. From the perspective of backpropagation, when the error backpropagation algorithm is used to modify the weight parameters on the convolution channel, its influence on the performance of the entire model will be weakened, thereby enhancing the robustness of the model.

2.2. Feature Extraction. SCNN has three feature extraction modules. Each feature extraction module consists of multiple convolutional layers stacked end to end. This makes the input data have a certain degree of discrimination even under nonlinear conditions.

$$f(x) = \tanh(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}, \quad (1)$$

$$f(x) = \frac{1}{1 + e^x}.$$

The quality makes it converge faster than the traditional tangent and sigmoid functions.

$$f(x) = \max(0, x),$$

$$f(x) = \begin{cases} x, & x \geq 0, \\ 0.33x, & x < 0, \end{cases} \quad f(x) = \begin{cases} x, & x \geq 0, \\ ax, & x < 0. \end{cases} \quad (2)$$

It can be derived from the formula:

$$\begin{aligned}
Z_j^{(1)} &= \sum_{i \in M} A_i^{(l-1)} \otimes W_{ij}^{(l)}, \\
A_i^{(l)} &= f(Z_j^{(l)}), \\
Y &= H(X, \{W\}), \\
&f(A^{(L-1)} \otimes W^{(L)}), \\
&f(f(A^{(L-2)} \otimes W^{(L-1)}) \otimes W^{(L)}), \\
&f(\dots f(X \otimes W^{(1)}) \otimes W^{(L)}).
\end{aligned} \tag{3}$$

For example, the error term of the i -th feature map of the l -th convolutional layer is

$$\begin{aligned}
\delta_i^{(l)} &= \frac{\partial J}{\partial Z_i^{(l)}} = \left(\sum_{j=1}^M \delta_j^{(l+1)} * W_{ij}^{(l+1)} \right) \otimes f'(Z_i^{(l)}), \\
\delta_j^{(l+1)} * W_{ij}^{(l+1)} &= \sum_{i=1}^q \sum_{\mu=1}^3 \sum_{\nu=1}^3 (w_{ij, A-\mu, A-\nu}^{(l+1)} \cdot \delta_{j, s+\mu-2, t+\nu-2}^{(l+1)}), \\
\frac{\partial J}{\partial W_{ij}^{(l)}} &= \delta_j^{(l)} \otimes (A_i^{(l-1)}), \\
V(t+1) &= \mu V(t) - \eta \left[\left(\frac{\partial J}{\partial W(t)} \right) + \lambda W(t) \right], \\
W(t+1) &= W(t) + V(t+1).
\end{aligned} \tag{4}$$

Similarly, the error terms of all hidden layers can be obtained, namely,

$$\begin{aligned}
\delta^{(L)} &= \frac{\partial J}{\partial A^{(L)}} \otimes f'(Z^{(L)}), \\
\delta^{(L-1)} &= \delta^{(L)} * W^{(L)} \otimes f'(Z^{(L-1)}), \\
\delta^{(2)} &= \delta^{(3)} * W^{(3)} \otimes f'(Z^{(2)}), \\
\delta^{(1)} &= \delta^{(2)} * W^{(2)} \otimes f'(Z^{(1)}).
\end{aligned} \tag{5}$$

3. Demand Research and Analysis of Online Teaching Platform

When designing an English university networking platform, the needs of users must be taken into account. Through this survey, this paper aims to learn about the real thoughts and needs of students and teachers about the openness of the network platform, the implementation of features, the design of the interface, and the design of the survey questions. This provides a basis for improving the design and development of the online platform for learning English in schools.

The users of College English Networking are mainly students and English teachers at universities. Due to the different perspectives of teachers and students, the

questionnaire is divided into two parts: a questionnaire for teachers and a questionnaire for students. The questionnaire is considered from four aspects: the openness of the network platform, function realization, interface design, and question design. The student and teacher questionnaires are divided into the following sections: the questionnaire for teachers and students about the teaching strategies of online platforms for teaching English in college; the questionnaire for teachers and students about the functional modules of the learning platform; the questionnaire for teachers and students about the types of practice questions in the learning platform; the questionnaire for teachers and students about the settings of the exam system of the learning platform as shown in Table 3.

Since the questionnaire should not be too long, and the questions should not be too many, it is generally controlled within 20 minutes to complete the questionnaire design requirements. Each module of the questionnaire consists of five multiple-choice or fill-in-the-blank questions. We hope that the survey will give students and teachers a rough idea of their opinions and needs regarding teaching strategies, functional models, and interface design of the networked learning platform. As the use of the networked learning platform varies from school to school and even from class to class, students and teachers also have different levels of engagement with the networked learning platform, and the depth of engagement varies, so the level of engagement is uneven. Due to time constraints and circumstances, this time, a simple random sampling of students from the whole school was used to select the sample.

The sample of the population is mainly 200 current students and 20 college English teachers from two 211 universities. These three universities are also typical Chinese universities, and the sample selection is universal. The questionnaires are one for teachers and one for students. In this way, it is possible to have a general understanding of the ideas and needs of students and teachers. The first question of the questionnaire is to investigate whether the surveyed students have used the university's online teaching platform. 83% of the students chose not to use it, and only 17% of the students had used the online platforms for teaching English. It is clear that the results of the survey reflect the expectations of university students regarding e-learning platforms. Most teachers and students perceive e-learning platforms as multifunctional tools that support learning. To the question "What is the purpose of using the platform?" only 7% of respondents answered "to consolidate their knowledge in the classroom," 2% "to prepare before class," 1% "to extend their knowledge," and 2% "to assess learning effectiveness." Nearly 88% of the students chose more than one learning purpose of using the online teaching platform. In the teacher questionnaire, all 18 questionnaires selected four choices. Similarly, among teachers, 100% of the teachers have chosen the online teaching platform and cannot replace classroom teaching. The positioning of the network teaching platform is only a teaching aid, which is used for students to preview, consolidate, expand, and evaluate the knowledge they have learned. The majority of students and teachers have also opted for an open approach to learning. When

TABLE 3: Classification of student questionnaire contents.

	Topic	Specific contents
System openness	1, 2, 3, 4, 5	The purpose of the learner's use of the platform, the need for the openness of the system
Functional module	6, 7, 8, 9, 10	Learner opinions on listed modules learner needs supplementary modules
Practice questions	11, 12, 13, 14, 15	Learner's comments on listed question types learner needs to supplement
Interface design	16, 17, 18, 19, 20	Learner opinions on interface interaction, background navigation
Test system	21, 22, 23, 24, 25	Learners' opinions on test methods, disclosure of test results, and pre-unit testing

answering “Do you like the open teaching platform?” 97% of the students chose to like it. When answering the question “Do you like the teaching platform of the obstacle-based grading test?” 85% of the students chose not to, and 98% of the students chose not to want the teacher to control their learning progress. They expressed their hope for an open learning environment where they can independently arrange learning content and learning progress. Although obstacle style learning can stimulate interest in learning, doing it wrong and always doing the following learning sometimes dampen the enthusiasm for learning. In addition, everyone's English foundation and learning methods are different, and the rigid grading barrier system is not flexible enough. 96% of teachers choose an open learning environment, and 97% of teachers choose not to control the progress of students' online learning too much, as shown in Table 4. They said that an open learning environment is more conducive to cultivating students' learning ability, and they can arrange English learning according to their own situation. At the same time, they also said that, due to time constraints, it is impossible for them to pay attention to each student's learning progress and learning situation every day and arrange their learning. They only go to the platform regularly to learn about their students. It can be seen from the survey that most teachers and students hope that the online teaching platform can create an open online English learning environment and provide multifunctional teaching functions. The teaching platform can not only improve students' English level, but also exercise students' learning ability.

The new computer network teaching environment requires teachers to change their teaching concepts in time and adhere to the “student-centered” teaching concept. They are needed to assist students by acting as analysts of students' learning needs and supervisors of teaching guidelines and general activities. This achieves the goal of changing the central position of the subject in classroom teaching activities and cultivating autonomous learning ability in the network. However, the survey statistics (Figure 7) show that the average behavior of teachers and students believes that only 47.6% and 44.3% of teachers can act as multimedia and student reference guides, and more than half of teachers pay little attention to their leadership roles. Without the ability to reasonably plan classroom teaching activities, it is impossible to provide students with opportunities for positive thinking and thoughtful feedback, and it is impossible to effectively stimulate students' learning motivation.

At the same time, the study showed that 43.6% and 47.3% of the students were rated as marginal and passive recipients of knowledge in the multimedia classroom and

autonomous learning network, respectively. This results in a distinct lack of centrality in learning, unclear personal learning needs, weak independent decision-making skills, and blind and passive acceptance of the learning process. As many as 34.7% of the learners were rated as lost network information, and their impact on learning was even more unsatisfactory as shown in Figure 8.

Developing teachers' literacy skills is a key factor in supporting the integration of ICT and foreign language teaching. Pupil evaluation is the most important factor in the impact and quality of teachers' teaching and use of ICT. The survey (Table 5) shows that more than half of the students have a positive attitude towards teachers' teaching of online literacy. However, some students' evaluations suggest that some aspects of teachers' teaching of information literacy are unfavorable. For example, in the case of online self-learning, 38.2% of students rate teachers' management and control skills as average, while 16.5% rate them as poor. In multimedia teaching, where the teacher's focus is mainly on explanation, 25.4% of students consider the teacher's computer skills to be inadequate. In addition, 19.4% of students consider the teacher weak in this aspect. Together with the results of the in-depth interviews, it can be concluded that teachers' computer skills are not good. This is particularly evident when it comes to the presentation of teaching materials and CD-ROMs, and when solving problems using machines. As regards the assessment of teachers' ability to use media to facilitate teaching, 39.2% of students consider this effect to be moderate and 12.1% almost nonexistent. Clearly, there is an urgent need to improve the quality of information provided by English language teachers.

In the context of e-learning and self-directed learning, with its emphasis on “learning to learn,” students are expected to show greater autonomy in their learning and self-discipline. However, research shows that almost half of students are not strong in this respect. Based on classroom observations and analysis of in-depth interviews, the gap between IT and students' ability to learn independently can be divided into two categories depending on the triggers. On the one hand, there are students who are not enthusiastic about e-learning because they are reluctant to learn English independently and because they are not enthusiastic about participating in the process. On the other hand, they have poor English language skills and difficulties in using the computer network. On average, 55.6% of students experience anxiety during e-learning, and 35.9% of students experience high levels of anxiety and frustration and are unable to complete the planned learning tasks as expected (see Table 6).

TABLE 4: Survey results table for the module’s student questionnaire.

	Tutorial learning	Text to expand knowledge	Personal study statistics	Test and score statistics	Online chatting	Download	Practice and practice management	Asynchronous communication platform
Modules frequently used by students	97%	71%	53%	85%	58%	91%	62%	78%
Modules that students do not like to use	1%	2%	0%	0%	1%	0%	2%	1%
Modules that students find useful	76%	10%	10%	77%	32%	89%	75%	61%
Modules that students find useless	0%	0%	2%	0%	0%	0%	62%	1%

Regarding the nature, extent, and causes of anxiety, this article presents a statistical analysis of pupils’ anxiety in a computer-based learning environment. The data show that the development and improvement of students’ autonomous learning abilities in this environment is influenced and limited by many factors, as shown in Figures 9 and 10. The study shows that boys’ anxiety levels in this school are higher than girls’ anxiety levels in online self-study. Science, technology, and medicine students have higher anxiety levels than literature and history students. Students in rural areas have higher anxiety levels than students in urban areas. First-year students have higher anxiety levels than second-year students. Students with poor language skills have higher levels of anxiety than students with computer problems. It is clear that when choosing strategies to reduce students’ anxiety problems, a number of natural factors must be taken into account, such as the students’ gender, years of experience, and specialization. It is necessary to combine knowledge of the original languages with computer skills.

4. Discussion

In the research, the article mentioned that a new unit learning mechanism was supported by students and teachers. With the continuous development of computer network technology, the network teaching environment promotes learners’ active learning at the same time. It also brings some negative effects to learners’ emotional development, which is the main manifestation of the imbalance of classroom teaching psychological environment. A survey shows that if learners live in a virtual teaching environment facing the computer for a long time, they will have different degrees of emotional deficit. Due to limited energy and time, and lack of effective intervention guidance, some learners often feel at a loss when faced with a vast sea of unfamiliar knowledge and information and even have negative anxiety. Due to their different ability to discriminate information, some learners are easily affected by bad information circulating on the Internet and have serious consequences of losing their learning direction. In the virtual learning space created by the Internet, some learners

with poor awareness of active participation often feel a serious lack of emotional care from reality. The main reason is that the independent learning style hinders the emotional communication between learners and teachers and students to a certain extent.

In the college English teaching under the computer network environment, teachers should actively give emotional intervention and teaching compensation of humanistic theory to the optimization of classroom psychological environment and encourage students to release their positive emotions. This improves the respective niche functions of teachers and students in the entire ecological teaching system and improves the application efficiency of the blended teaching model. First, it is necessary to start from the humanistic teaching theory and pay attention to the changes of students’ emotions. Humanistic teaching theory attaches great importance to human emotions and emphasizes that the classroom should be free from the influence of anxiety. It believes that education should be adapted to human nature and natural tendencies. All true knowledge originates from the sensory experience of the senses from external things and values the development of the learner’s inner self. It needs to enhance students’ self-confidence and learning motivation. Combined with the analysis of the results of the empirical research in the previous chapter, in language teaching, teachers should pay special attention to boys and students from disadvantaged groups in foreign language learning from rural areas and other areas. They need to be given more opportunities for spiritual encouragement and exercise, listening to and respecting their learning needs. It is necessary to help them build up emotional self-confidence and minimize their anxiety about foreign language learning. Second, it is necessary to use compensation strategies to alleviate students’ anxiety in online self-learning. We carry out college English teaching in the computer network environment. Due to the addition of information technology, the traditional teaching methods and means have been impacted, and their role in promoting teaching in the new environment is greatly reduced. This requires teachers to be flexible in time and choose other teaching methods and means to make effective teaching compensation.

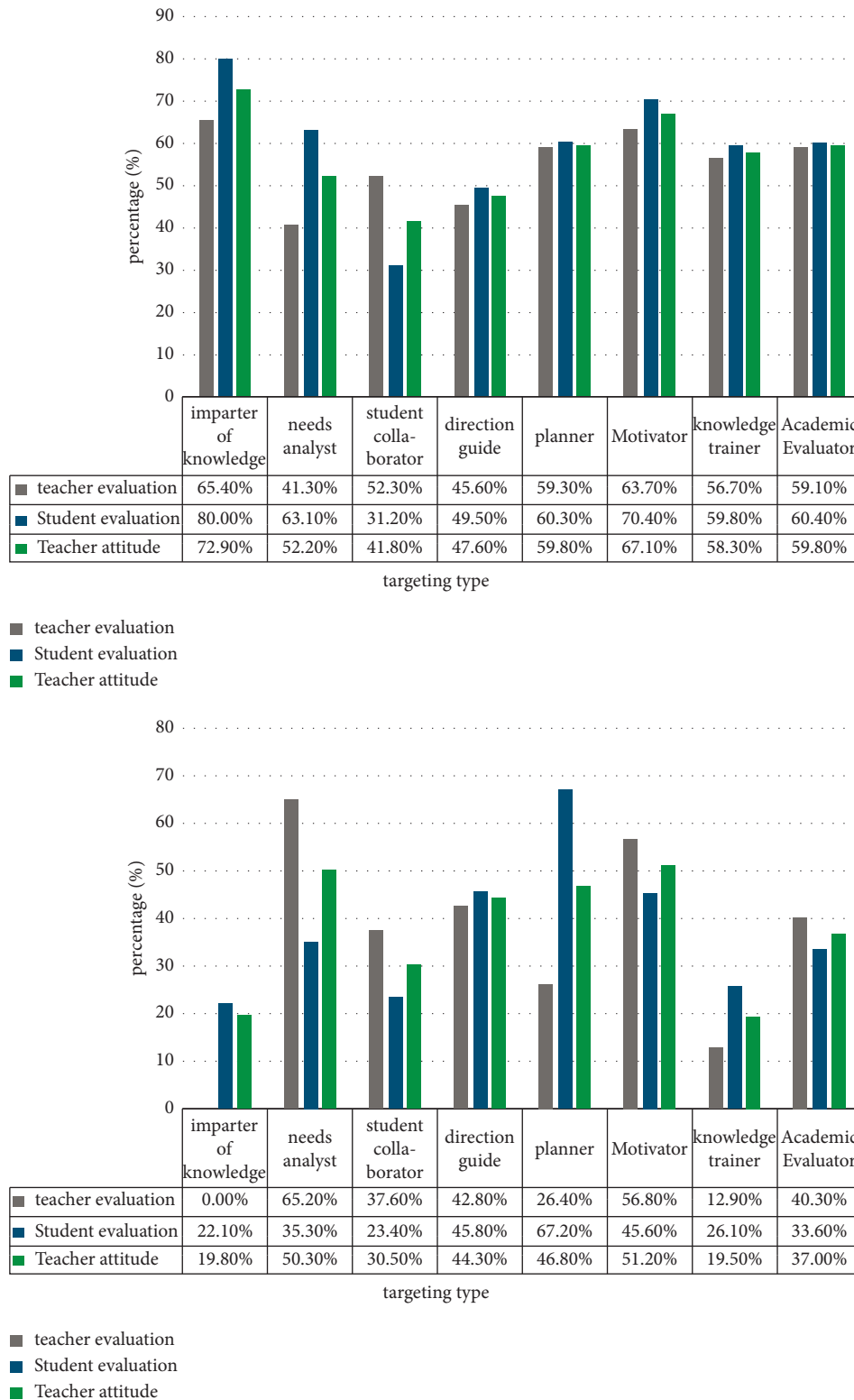


FIGURE 7: Teachers and students' evaluation of teachers' role orientation in the school's computer network environment.

Combined with the analysis of the results of the empirical research, in the online autonomous learning with students as the important behavior subjects, students' learning anxiety is more serious. The reason is that, on the one hand, students' basic knowledge of English is weak,

and on the other hand, they lack effective learning strategies and technical guidance. The existing teaching conditions show that there are very few people who have both higher foreign language teaching ability and are proficient in information technology. This does not provide

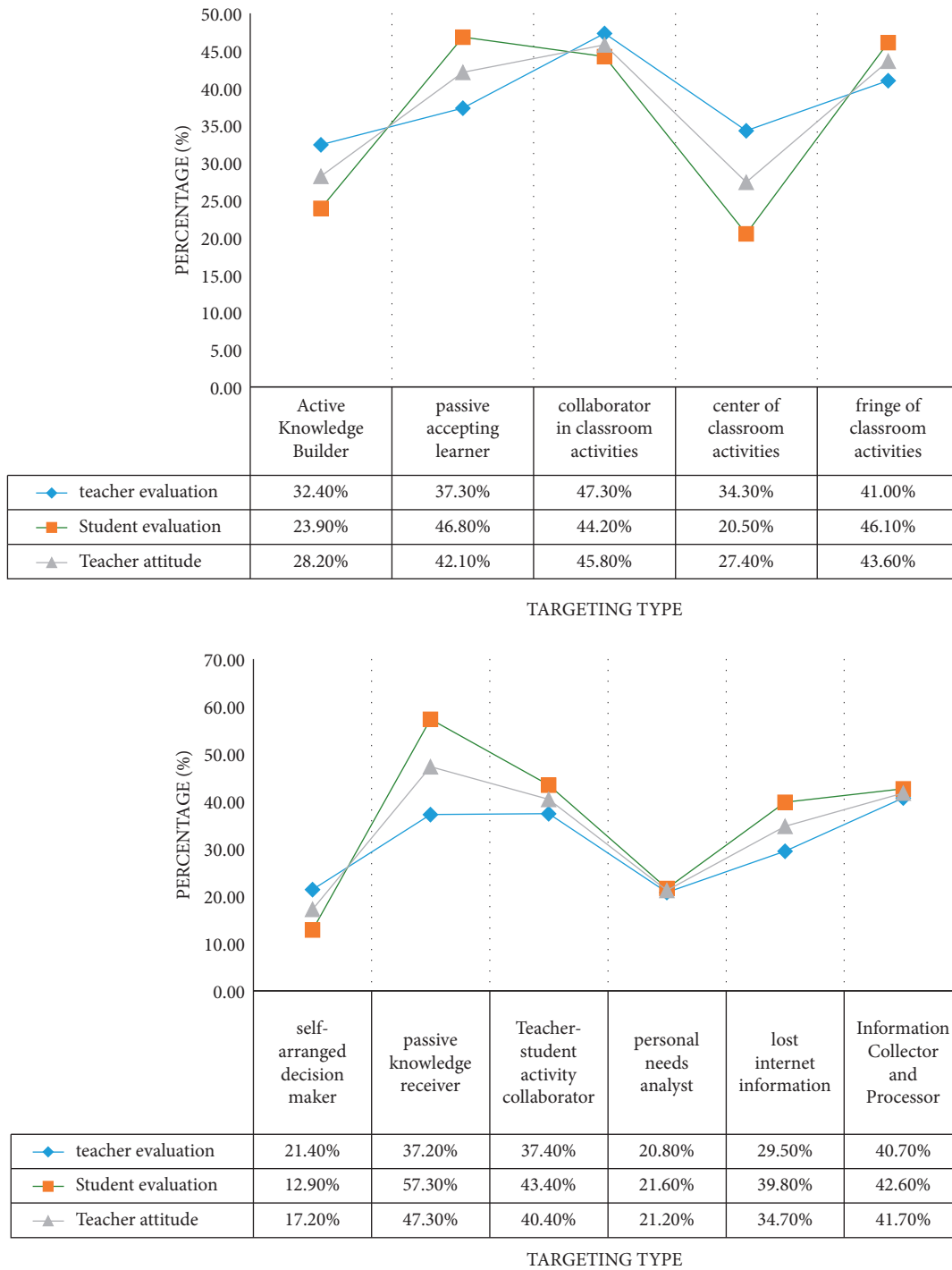


FIGURE 8: Teachers and students' evaluation of students' role orientation in the school's computer network environment.

immediate and efficient learning support for students in the learning process. Teachers and teaching assistants can cooperate with each other and provide services to students in a timely manner; that is, foreign language teachers provide students with professional knowledge and learning strategies guidance. As for the teaching assistants who are responsible for managing the self-learning computer room, they provide students with network operation strategies and technical guidance. The joint efforts

of both parties will largely compensate for the lack of students' needs. This will also improve students' interest in online self-learning, relieve anxiety, and promote the development of personalized learning. To a certain extent, this is also an effective adjustment to the current imbalance between teaching equipment and background management. It can promote the ecological process of the integration of computer network technology and foreign language courses.

TABLE 5: Students' evaluation of the basic quality of teachers' online education in the school.

Teacher evaluation/student type		Outstanding students	A table of undergraduates	Second table undergraduate students	Three table undergraduates	Average ratio
Guidance and monitoring of students' network autonomous learning	Better	36.2%	44.6%	42.5%	54.3%	45.3%
	Generally	31.1%	38.6%	40.9%	40.8%	38.2%
	Not good	32.7%	16.8%	16.6%	4.9%	16.5%
Computer skills	Better	45.9%	51.9%	59.3%	62.2%	55.2%
	Generally	29.1%	27.3%	24.1%	20.1%	25.4%
	Not good	25.0%	20.8%	16.6%	17.7%	19.4%
Using computers to promote teaching	Better	50.4%	43.1%	52.2%	50.8%	48.7%
	Generally	39.8%	41.6%	34.9%	39.5%	39.2%
	Not good	9.8%	15.3%	12.4%	13.5%	12.1%

TABLE 6: Survey results of the overall situation of students' learning anxiety in the computer network environment.

Teacher evaluation/student type	Outstanding students	A table of undergraduates	Second table undergraduate students	Three table undergraduates	Average ratio
There is a tendency to study anxiety in the online environment	44.1%	43.3%	59.2%	66.7%	55.6%
High level of learning anxiety in the online environment	22.7%	34.6%	38.5%	44.4%	35.9%
Number of people	52	14	62	32	15

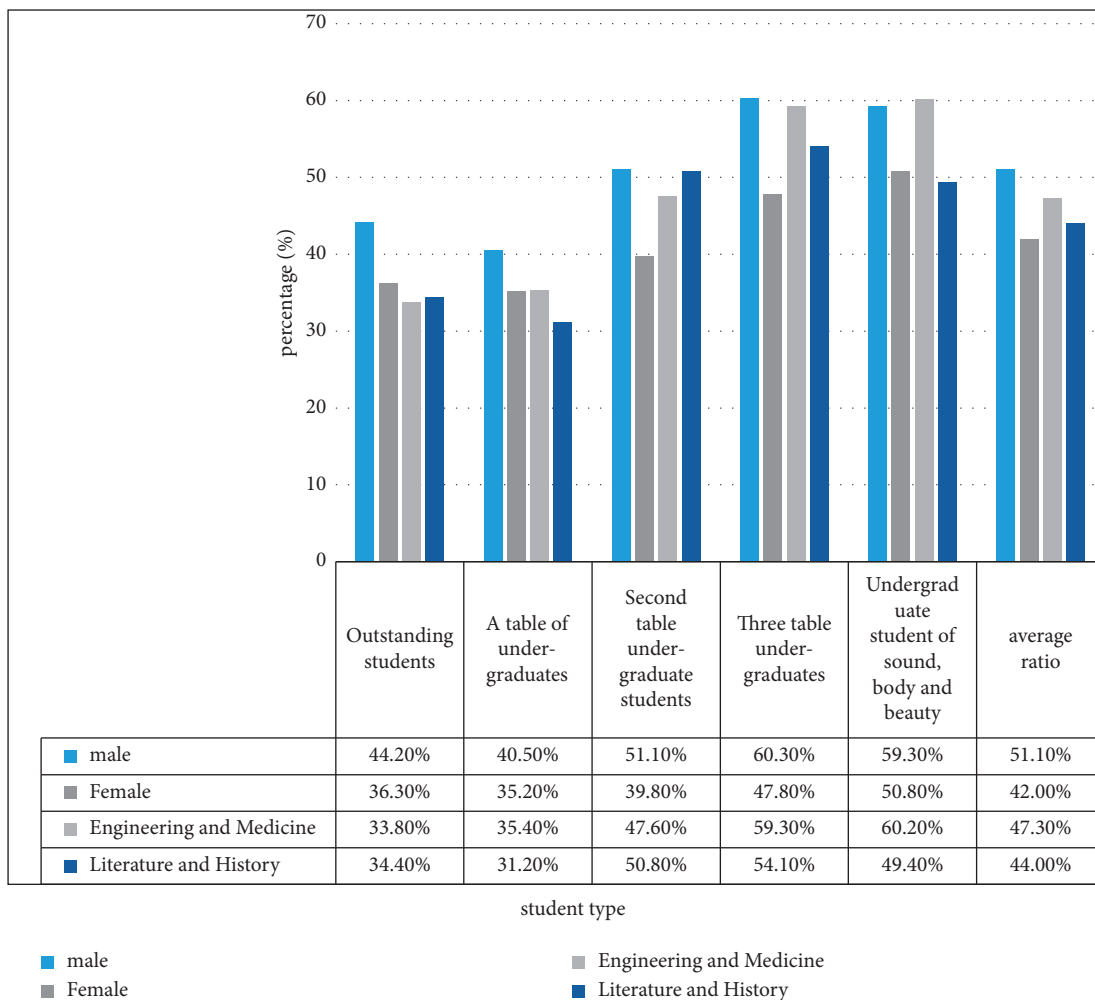


FIGURE 9: Classification survey results of students' learning anxiety in the computer network environment.

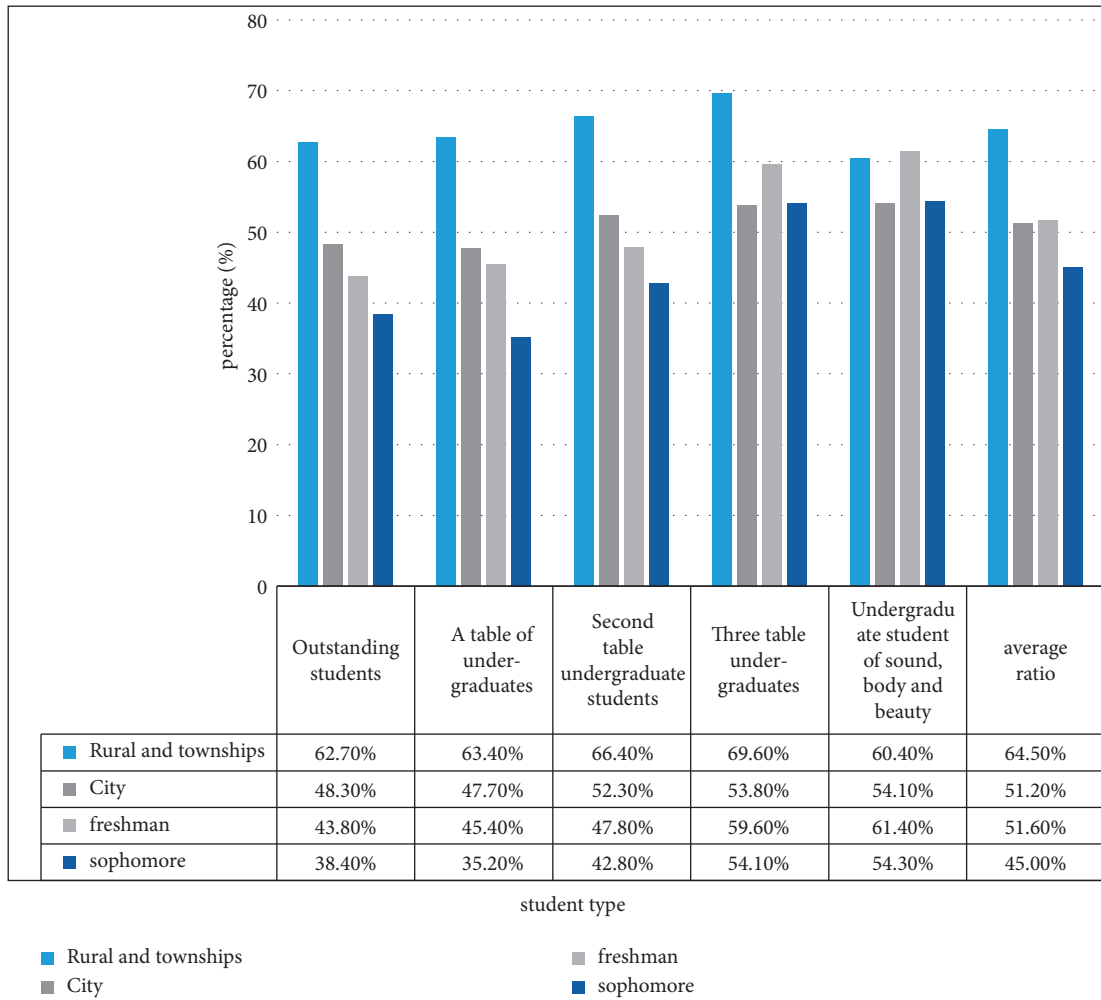


FIGURE 10: The results of the investigation on the influencing factors of students' learning anxiety in the computer network environment.

5. Conclusion

Due to the rapid development of computer network technology and the constant updating of teaching concepts, an unbalanced teaching system leads to many imbalances in the classroom. These imbalances and inconsistencies seriously limit the progress of foreign language teaching. Therefore, it is very important to examine foreign language teaching in a computer network environment from the point of view of educational ecology, identify the phenomenon of imbalance, analyze the causes of imbalance, and find an optimization strategy to establish an ecological method of teaching English in universities. The theoretical study of the application of computer network technology in language teaching is the result of continuous optimization, combination, and integration based on theoretical research in various disciplines. In this paper, the theoretical framework of educational ecology is selected, and the basic principles and ecological laws of this theory are presented. Especially for the selection of the optimization strategy, only relatively sufficient theoretical construction and laboratory assumptions have been carried out, and the relevant classroom practice tests are relatively lacking. There are several links between ecological

theory and language teaching in a computer network environment. These links are analyzed in detail from the point of view of personal ecology, population ecology, and systems ecology, and a teaching method based on ecological theory is defined. In the context of the practice of English teaching reform in Chinese universities, a specific empirical study is conducted to answer the research questions. It defines the research variables from three perspectives: students, teachers, and the teaching environment in the context of the network. Using questionnaires, in-depth interviews, and classroom observations, it integrates teachers' and students' evaluations of multimedia classrooms. This is a systematic and persistent task project, and the overall research has a long way to go. It requires the unremitting efforts of all levels of education and scientific research workers and constantly opens up the ecological development path of teaching reform, so as to truly realize the sustainable development of college English teaching.

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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