Foreign Language Teaching Mode of Online Education under the Computer Multimedia Network Environment

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Abstract: The utilization of information technology has brought about significant changes in people's work and daily lives, and it has also played a crucial role in transforming the education sector and teaching methods. Currently, there is a growing trend of incorporating information technology into the field of education, where advanced methods and technologies are being employed for effective information dissemination. This paper aims to optimize the foreign language teaching mode in the computer network environment to promote the ecological development of online foreign language teaching. The article proposes that the use of educational ecology to guide the integration of computer networks and foreign language courses is helpful to analyze and solve the objective system imbalance and ecological imbalance in online foreign language teaching. Learning from the principles and laws of educational ecology to construct and optimize the ecological teaching mode, it can be realized that the ecologicalization of online foreign language teaching. In the context of students' online self-learning classrooms, a significant portion of students (38.2%) perceive their teachers' ability to guide and monitor their progress as average, while 16.5% feel that their teachers' skills in this area are lacking. Similarly, when it comes to evaluating the effectiveness of teachers utilizing computer multimedia networks to enhance teaching, 39.2% of students believe the impact is average, while 12.1% feel that there is minimal to no effect. Consequently, it becomes crucial to analyze and assess the foreign language teaching methods employed in online education within the computer multimedia network environment.

1. Introduction

Although information technology has played a certain role in foreign language teaching, in practical application, people cannot use some advanced equipment such as computers to effectively carry out teaching activities due to incomplete understanding of it. This will lead to the incompatibility of students in the process of teaching, which will affect the teaching quality of the

whole class. Although the application of information technology in high school foreign language teaching has been around for a long time, there are still many problems, such as the inconsistency between the hardware construction level and application level of information technology. When the course is implemented, it only pays attention to its form, but does not really realize the assistance of English difficult and key knowledge explanation, which cannot promote the improvement of teaching quality.

This paper studies the foreign language teaching mode based on information technology, which can understand the current development of information technology in foreign language teaching. Its related problems are also summarized. Through the experience sharing of relevant teaching cases, it is proposed to promote the application of information technology in foreign language teaching practice. On the one hand, it can help teachers correctly and efficiently use information technology to carry out teaching, which increases teaching capacity. It can help students fully perceive teaching content. Teachers can also break down difficulties, improving students' classroom participation rate and teaching efficiency. On the other hand, it can provide relevant information for research in this field and promote its development.

The innovation of this paper include that: (1) It qualitatively introduces the educational background of the era of the integration of computer network and foreign language courses, and clarifies the research purpose and practical significance of constructing a healthy, harmonious and healthy development of ecological foreign language teaching model. (2)It also introduces strategies such as schema thinking, implicit learning, and emotional intervention compensation into foreign language classrooms under the computer network environment. The construction of a "teacher-led-student-subject" hybrid ecological teaching model with independent learning and democratic teaching is strengthened and improved.

2. Related Work

With the spread of the epidemic, the foreign language teaching mode of online education has become more and more important. Yaman S's study found that English as a foreign language (EFL) textbooks cover multicultural elements. These cultural elements were not only limited to the target culture, but also included local and international cultural components [1]. Although his research may have implications in the field of language teaching, there are still gaps in teaching English in an EFL setting.The exploration of communicative patterns and language characteristics across different languages has become a well-established research practice. In a study conducted by Adinolfi L, pedagogical practices involving multiple languages were examined within a corpus of online group tutorials for beginner-level Spanish learners. Through a macro-analysis of the interaction patterns observed in this context, it was found that both teachers adhered closely to the instructional guidelines set by the course designers for the specific activities they were involved in [2].However, whether in face-to-face or online teaching, the application and research of cross-language teaching practices in foreign language teaching settings is still insufficient. Alkan M F compared the teaching systems of English as a foreign language (TEFL) in different countries. Comparisons were made with respect to general education systems, goals and objectives, content, teaching and learning processes, and assessment. The findings suggested that Turkey has a more centralized structure among countries [3]. In recent years, the epidemic has led to a forced transition to distance learning in teaching models. The aim of Samorodova E A research was to develop and describe the most effective foreign language teaching models under specific conditions [4]. Amara K's research showed that foreign language courses can provide unique opportunities to provide a multilingual, multicultural environment using cultural elements in course content and course materials, as well as teachers' personal experiences in the classroom [5]. His research highlighted

the critical role of foreign language teaching in improving students' intercultural competence and the lack of opportunities it provided. Halsema C V contrasted the rapidly growing business industry of digitally mediated foreign language education with the dwindling support for foreign language courses by American universities [6]. The results were analyzed to demonstrate the need for foreign language education at the university level and then it needs to be dug deeper. Although the characteristics of those most successful online classroom models have been identified, there are still gaps in exploring how digital spaces have and will shape teacher-student relationships and performance in foreign language learning.

Information technology such as computer network is widely used in foreign language teaching. Zhao Y analyzed an optimization method for foreign language teaching innovation using multimedia network resources. The fusion of online education and multimedia technology improved the effect of language learning [7]. With the development of computer network technology, the methods of foreign language teaching have changed. The computer-assisted speaking test is a new test method. Zuo L used a hidden markov model (HMM)-based scoring system to compare the performance of the two tests. He also analyzed participants' attitudes towards the computer-assisted oral English test in the form of a questionnaire [8]. The results showed that the computer-aided oral English test could relieve tension and reduce stress, but the computer-aided oral English test did not better reflect the real level of students. Despite significant investment in English education around the world, it has not been effective in changing the way foreign languages are taught. Lee S aimed to summarize a set of POSTECH methods, including theory, technology, systems and field studies, and provide related pointers [9]. Zhao N used a combination of qualitative and quantitative methods to carry out empirical research with Jiamusi University as the research object, and summarized the unbalanced development of the integration of traditional foreign language teaching and modern educational technology [10]. Although the ecological teaching mode of college English under the computer network environment is constructed, the reasons for maladaptation have not been analyzed from the angle of education ecology. With the continuous improvement of visualization and human-computer interaction in foreign language teaching, students have become accustomed to learning in a multimedia environment. Cai X optimized the teaching mode and multi-dimensional evaluation of foreign language learning based on the online cloud platform [11]. Although the factors affecting the teaching effect were analyzed, some relevant optimization suggestions were not put forward. Xingzhu P proposed a new teaching mode based on multimedia and Internet technology. Teaching practice and data analysis showed that the college foreign language teaching mode based on multimedia and Internet technology was ideal [12]. Computer network foreign language teaching reflects the integration of traditional and modern teaching methods, which is accepted by students and is undoubtedly effective for language teaching, but there are still deficiencies in application.

3. Methods of Foreign Language Teaching Mode in Computer Multimedia Network Environment

3.1 Overview of the Teaching Model

Multimedia interactive teaching mode creates more opportunities for students to participate in classroom activities, thereby improving students' ability to participate in classroom interaction. Students can actively participate in classroom interaction, changing the state of "sitting and listening" in the past, enabling students to acquire knowledge and develop interactive ability [13]. Secondly, the interactive teaching mode creates positive learning opportunities for students. This model aims to share classroom teaching activities for teachers and students so that students can truly experience classroom teaching activities. It enables students and teachers to fully understand

that the classroom is not only the personal performance of teachers, but also the common task of teachers and students [14]. In the classroom, the role of students changes from passive acceptance learning to independent innovation learning. In addition, the implementation of interactive teaching mode can stimulate and cultivate students' interest and attitude in learning English. In the interactive classroom, teachers create different forms of interaction, and each student feels a close connection with classroom activities and finds appropriate forms of interaction in the classroom [15]. When students participate in English classroom interaction, they will unconsciously have a good interest and attitude towards learning English. As students become more interested in learning, their English grades gradually improve.

In a word, the teaching mode is a framework and process constructed under the guidance of a specific teaching concept, which can reflect the objective laws of teaching development [16]. It is based on a specific teaching theoretical basis. It represents the mode or form of actual teaching activities or processes, and specific examples of the activity structure and process of a specific teaching subject, so it has both external appearance and internal reality (the theoretical basis of teaching).

3.2 Teaching Ecosystem

As far as the foreign language teaching ecosystem itself is concerned, "system" refers to the interconnection, and "system" also refers to the unification of various parts into an organic whole, so we can call this or that cognitive object a system in our daily life. It means a unified whole composed of various parts, structures, levels, and environments. For example, the whole system of foreign language teaching may be like this. The foreign language teaching system is shown in Figure 1.
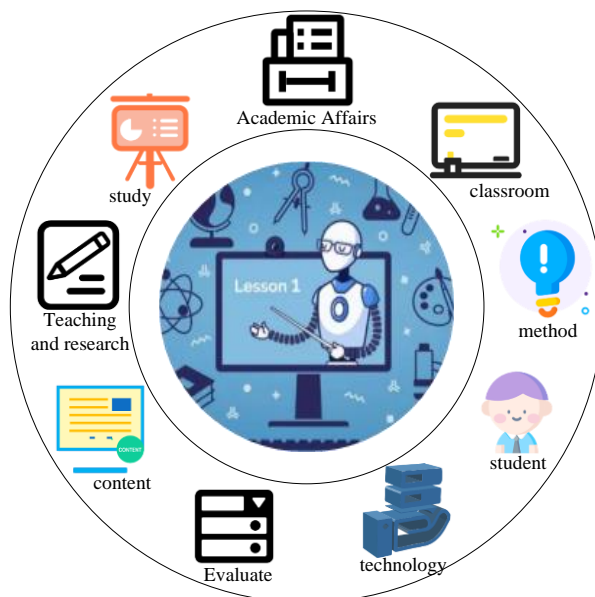

Figure 1: Foreign language teaching system

As shown in Figure 1, it should be pointed out that the foreign language teaching system itself is a huge and complete system, which includes all aspects of the foreign language curriculum, so this system is larger than the curriculum. It has other elements and structures that overlap and spiral into the system. Each part (element) of the whole foreign language teaching system certainly has its specific function, but the function of the whole system is greater than the sum of the functions of its

elements [17]. Computers can play the roles of both teachers and learners, as shown in Figure 2.
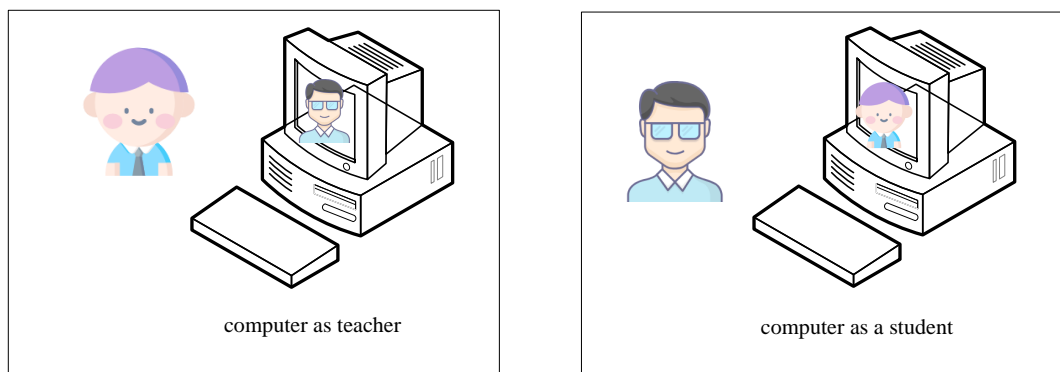

Figure 2: Computers as teachers and students

As shown in Figure 2, learners can now connect multiple microcomputers wirelessly, and each computer can access the learning content they need anytime, anywhere. Every learner can learn on demand, and the embryonic form of computer-assisted education is taking shape [18]. Dominance mode also allows computers to function as teachers and learning partners or to function as learners' peers, interacting and collaborating with learners, as shown in Figure 3.
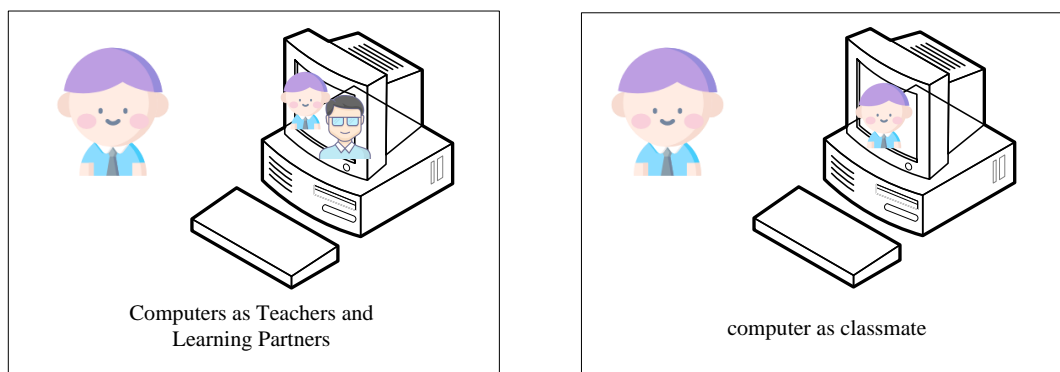

Figure 3: Computers as partners and classmates

As shown in Figure 3, the computer under the dominant mode can play a variety of roles in foreign language teaching, making foreign language teaching truly virtualized, personalized, extensive, timely, cooperative and natural. Using information technology in foreign language teaching, teachers can create teaching situations related to teaching content through information processing methods, and teach the teaching content to students through dynamic or static demonstrations. It makes students feel as if they are on the scene, so that it is easier to stimulate students' initiative in learning than traditional high school English classroom teaching [19]. At this level, the application of information technology in foreign language teaching is an improvement on the use of multimedia technology in classrooms in traditional foreign language teaching. This kind of situational creation mode throughout the whole teaching process can indeed produce good effects on students' emotional and aesthetic education. In this form of teaching, as long as teachers have studied the teaching materials before class and know the key points, difficulties and important issues, they can use information technology to accurately and effectively convey to students what is difficult to understand in written narratives or oral lectures.

3.3 Foreign Language Teaching Mode

In the construction of foreign language teaching mode, teaching ideas and teaching theories are its theoretical basis, and the content can cover pedagogy, educational psychology, foreign language teaching theory, foreign language learning theory, technology and other multidisciplinary theories that can guide the construction of the model. Specific teaching goals for foreign language education objects at different levels needs to be set. According to the theoretical guidance and the elements of the model, a relatively stable structural paradigm of teaching activities is formed. In the specific operation process, according to the needs of the actual teaching situation, the teaching strategies and operation steps are appropriately changed, so that the construction of the model can be gradually improved.

Because the most essential difference between modern foreign language teaching and traditional teaching is the participation of computer network technology, which makes many teaching contents such as teacher-student communication methods have undergone diverse changes [20]. How to make full use of the advantages of computer network technology in information query, information presentation, human-computer interaction, network communication, etc. to relieve the pressure of teaching and learning on teachers and students, and to allow teachers to have more time and energy to conduct individual supervision and emotional exchanges with students is an inevitable way to truly realize personalized teaching. It is also the practical significance of the implementation of teaching strategies and activity design plans in the micro-level of model construction.

3.4 Data Mining Foreign Language Teaching Model

The information direct refers to the uncertainty of measuring the random variable Y={c1,c2,c3,...ck}. The greater the information direct is, the greater the uncertainty will be. That is to say, in the classification category, the more information contained is, the larger the descendant is. The calculation method is shown in the Formula 1.

$$(X) = -\sum_{i=1}^{n} p(x_i)\log(x_i) \tag{1}$$

X represents a certain category; p(x) represents the probability of selecting the category. H(X) represents the sum of all categories. If there is only one category, p(x)=1, the descendant is 0. The smaller the descendant is, the higher certainty will be. The information gain represents the difference between the amount of information before and after the initial division of the data set according to the feature T. The higher the information gain is, the stronger the classification ability will be. The specific calculation is shown in Formula 2.

$$Information\ Gain(T) = Entropy(s) - Entropy(S/T) \tag{2}$$

C4.5 uses the information gain rate as the branch criterion for selecting branch attributes of the decision tree, which represents the useful information ratio generated by the branch. The larger the value is, the more useful information the branch will contain. Its expression is shown in Formula 3. Gain is the information gain, and H(S, A) is the information direct.

$$ainRatio(S, A) = \frac{Gain(S,A)}{H(S,A)} \tag{3}$$

The Gini coefficient is used to represent the uncertainty of the data. The larger the Gini coefficient is, the greater the uncertainty of the sample set will be.

$$Gini(p) = \sum_{k=1}^{k} pk(1 - pk) = 1 - \sum_{k=1}^{k} p^2 k \tag{4}$$

If it is a two-class classification problem, the calculation will be relatively simple. If the

probability of belonging to the first sample output is p, the Gini coefficient is expressed as Formula 5:

$$Gini(p) = 2p(1 - p) \tag{5}$$

Definition 1: clustering feature (CF). CF is used to describe the information summary of sub-clusters of objects, and it includes cluster information projected onto other attribute sets. Its formula is as Formula 6:

$$CF(C_x) = (N, \sum_{i=1}^{N} t_i[x], \sum_{i=1}^{N} t_i[x]^2) \tag{6}$$

In Formula 6, N represents the number of all tuples in the subcluster.

Definition 2: association cluster feature (ACF). Assuming C_x=t1, t2,…tn, the ACF formula is as Formula 7:

$$ACF(C_x) = (N, \sum_{i=1}^{N} t_i[y], \sum_{i=1}^{N} t_i[y]^2) \tag{7}$$

Definition 3: dense evaluation of clusters. S[X] is supposed be the set of N datasets t1, t2, ..., tw projected onto attribute set X. Then the distance metric formula of S[x] is as Formula 8:

$$d(s[x]) = \frac{\sum_{i=1}^{N} \sum_{j=1}^{N} \sigma_x(t_i[x], t_j[x])}{N(N-1)} \tag{8}$$

σ represents the distance measure between tuples. When the distance of S[x] is larger, the deviation of its dataset projected to attribute set X is larger.

Definition 4: interval rule division. A cluster C on the attribute set x should be less than or equal to the density threshold d, and greater than or equal to the frequency value, namely as Formula 9 and Formula 10:

$$d(c_x[x]) \leq d_0^x \tag{9}$$

$$c_x \geq s_0 \tag{10}$$

The minimum number of tuples in a cluster is determined by the value of "s". When data clusters exhibit a higher density distribution, they are more likely to meet the frequency threshold requirement and gain sufficient support. Clustering takes into account the relative distances between data points or intervals, which enables the division of quantified attribute values into appropriate partitions. This approach effectively resolves the issue of data set segmentation.

3.5 Matrix Factorization Algorithm

Implementing this matrix factorization solves the following optimization problem as Formula 11:

$$\min f = \sum_{i,j}(r_{ij} - u_i \cdot v_j)^2 \tag{11}$$

In order to facilitate the calculation, the commonly used regular term is the second normal form. After adding, the formula becomes the following ridge regression form as Formula 12:

$$\min f = \sum_{i,j}(r_{ij} - u_i \cdot v_j)^2 + \gamma_u ||u_i||^2 + \gamma_v ||v_j||^2 \tag{12}$$

Formula 12 indicates the weight of the user model to the scale, and is used when expressing the weight of the project model to the scale. The pair is not necessarily non-negative for the Pearson correlation coefficient, so:

$$(r_{c,i} - \bar{r_i})(r_{c,i} - \bar{r_j}) \leq 4[max(\bar{r_i}, R - \bar{r_i}, \bar{r_j}, R - \bar{r_j})]^2 \tag{13}$$

$$\max sim(i, j) \leq sim_k(i, j) + 4(C - k)[max(\bar{r_i}, R - \bar{r_i}, \bar{r_j}, R - \bar{r_j})]^2 \tag{14}$$

3.6 Distance Metrics in Cluster

Many clustering algorithms divide data objects into different clusters by similarity. There is a mutually exclusive relationship between dissimilarity dis and similarity sim, which can be transformed by Formula 15:

$$dis = 1 - sim \qquad (15)$$

or Formula16:

$$dis = \frac{1}{sim} - 1 \qquad (16)$$

For objects m_i and m_j with m attributes, common distance formulas are:
Euclidean distance

$$d(m_i, m_j) = ||m_i - m_j|| = [\sum_{n=1}^{x} |m_{in} - m_{jn}|^2]^{\frac{1}{2}} \qquad (17)$$

Manhattan distance

$$d(m_i, m_j) = \sum_{n=1}^{x} |m_{in} - m_{jn}| \qquad (18)$$

Chebyshev distance

$$d(m_i, m_j) = \max|m_{in} - m_{jn}| \qquad (19)$$

Minkowski distance

$$d(m_i, m_j) = [\sum_{n=1}^{x} |m_{in} - m_{jn}|^n]^{\frac{1}{n}} \qquad (20)$$

4. Construction of College English Ecological Teaching Mode under Computer Network Environment

To effectively analyze the causes of dissonance and explore potential solutions, it is challenging to rely solely on traditional teaching theories. While these theories can adequately explain the nature of human learning activities, the changing elements within the integrated teaching system have posed challenges to these traditional theories. The existing teaching system now encompasses not only teaching and learning aspects but also incorporates technology and resources. Research on the ecological foreign language teaching mode has yielded significant findings in both macroscopic and microscopic domains. The objective of this study is to propose specific strategies for optimizing the teaching mode based on empirical research results, with the aim of contributing to microscopic research in this field.

4.1 Integration of Computer Network and Foreign Language Teaching

The integration of computer network and education has changed the nature of education mainly from three aspects: breaking through the shackles of "classroom + textbook", creating an ideal teaching environment and model, and fundamentally changing the structure of education.

Computer-assisted education is still classroom and textbook-based, which means that the only source of students' knowledge is the textbook. As shown in Figure 4.
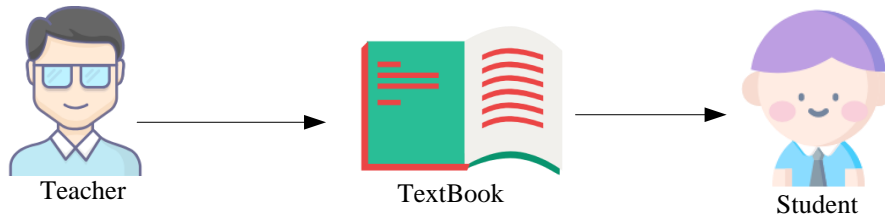
Figure 4: Textbook-based teaching

Figure 4 illustrates the interdependent relationship among teachers, textbooks, and students. Teachers play a crucial role in leading the classroom and imparting knowledge to students. They utilize textbooks as a tool for communication with students, analyzing and interpreting the content to facilitate effective learning. Textbooks serve as a medium for the transmission of knowledge between teachers and students, facilitating the exchange of information and ideas. Students learn (receive) knowledge through the teacher's analysis and interpretation of textbooks. The main feature of this model is that teachers dominate teaching, students are completely passive as the object of "indoctrination", and teachers use computers as an auxiliary tool for teaching, as shown in Figure 5.
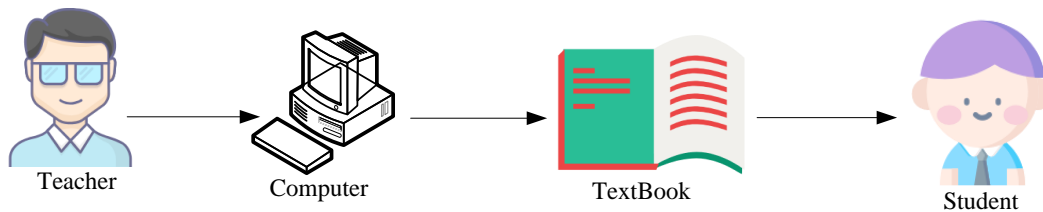

Figure 5: Traditional computer-aided instruction

As shown in Figure 5, the traditional form that textbooks are the only source of knowledge for students has not been broken. Teachers only teach textbook knowledge to students through demonstrations and explanations on computers. Computers only enhance the effect and means of teaching. However, integrating computer networks into the curriculum can change this, as the context of teaching has fundamentally changed, as shown in Figure 6.
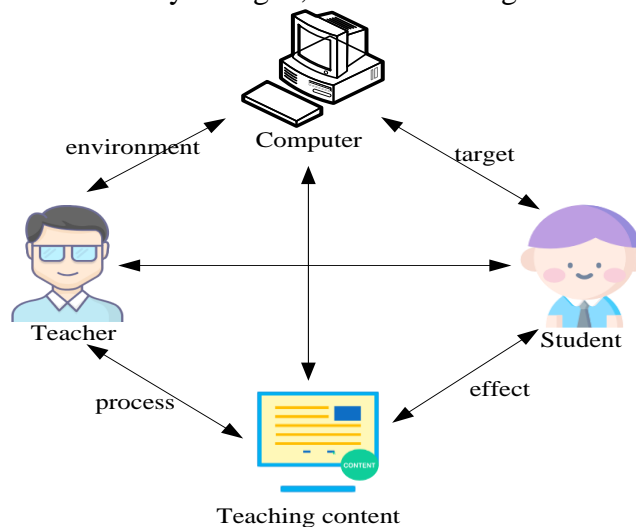

Figure 6: Integration framework of computer and foreign language teaching

As shown in Figure 6, when it comes to teaching elements, the relationship between teachers, students, computers and educational content is not one-way but a two-way relationship of mutual connection, interaction, interdependence and mutual communication.

4.2 Ecological Model of Foreign Language Teaching in the Computer Network Environment

In this integration of computer-aided education, the role of teachers is undergoing fundamental changes. Teachers are no longer the center of classroom teaching. Students are changing from passive recipients of knowledge to active knowledge builders. Students' sources of knowledge also expand from a single printed textbook to a multitude of media. As shown in Figure 7.
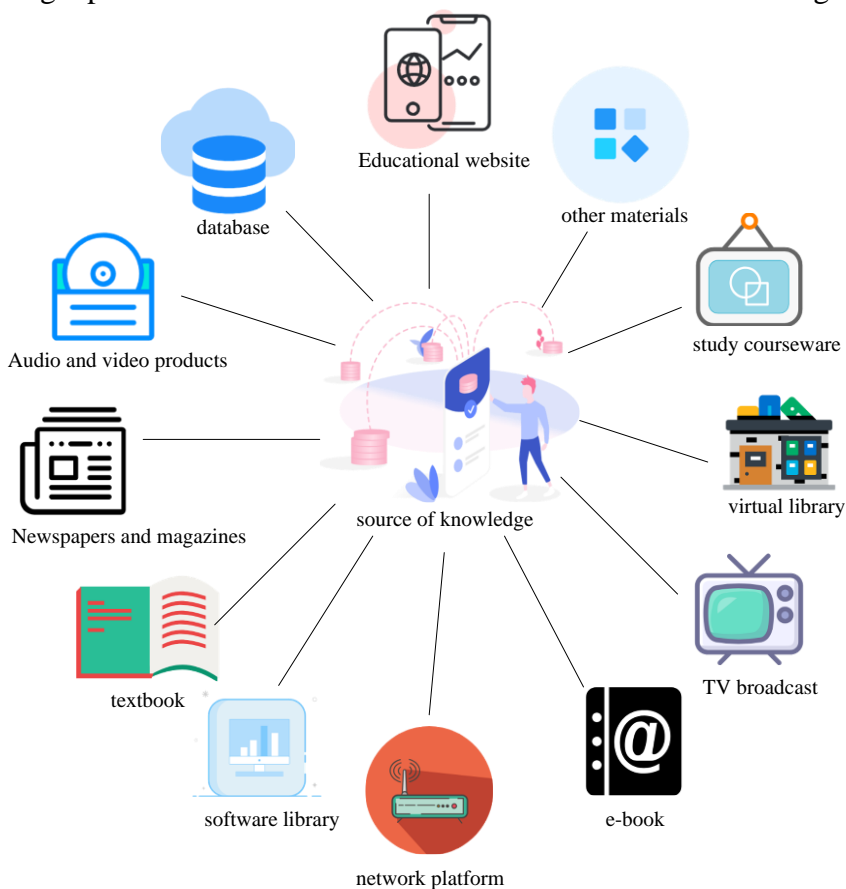

Figure 7: Sources of knowledge

As shown in Figure 7, there are many ways in which students can acquire knowledge far beyond textbooks and engage in meaningful and active knowledge building throughout the learning process. The ecological model of foreign language teaching in the computer network environment is underpinned by both foreign language teaching theory and educational ecology, integrating and optimizing various teaching elements. Utilizing computer network technology as a catalyst for development, this model aims to achieve specific teaching objectives. It employs diverse teaching strategies to effectively present content, representing a theoretical educational process and a pathway towards constructing and optimizing modern language teaching modes. This model advocates for open selection of teaching materials based on instructional needs and predominantly emphasizes task-based teaching activities that foster collaboration and mutual assistance between teachers and students. Such an approach contributes to the cultivation of students' language communication skills and their ability to apply language knowledge comprehensively. Considering

the current integration of computer network technology and foreign language courses, it is essential to comprehensively assess factors such as the software and hardware conditions of computer network technology, teaching objectives of foreign language courses, teaching staff's willingness to select information and their proficiency in network teaching, students' learning motivation, proficiency level, and network application skills, as well as the auxiliary background management mechanism for network teaching. By comparing and analyzing the gaps and points of convergence between the ideal foreign language teaching mode in the computer network environment and the actual teaching situation in schools, a reasonable and well-designed series of plans can be formulated. This approach aims to establish a foreign language teaching model that aligns with the unique development conditions of each institution, possesses clear development goals, and offers ample room for growth.

5. Experimental Data of Foreign Language Teaching

Combining the survey data and textual information obtained from the above series of research activities, the following conclusions can be analyzed and drawn: On the one hand, the teachers and students of the school are generally active in the teaching reform activities of the integration of computer network technology and college English curriculum, and there are some similarities in their acceptance and evaluation attitudes towards curriculum integration. On the other hand, the integration of computer networks and college English courses has promoted the development of modern foreign language teaching to a considerable extent. However, there are many inconsistencies between the new teaching environment and the traditional teaching mode in the process of connecting and developing. These inconsistencies seriously hinder the healthy development of foreign language teaching in the new environment. This chapter summarizes the developmental disorders revealed by survey data and textual information from the micro-domain of teaching and learning, and analyzes the causes of the disorders from an ecological perspective.

## 5.1 Dissonance between Teaching Concept and Role Orientation of Teachers and Students

In the new computer network education environment, teachers should change their educational concept. Following the "student-centered" educational concept, they become an analyst of students' learning needs to guide their learning, supervise their entire activities. They improve their ability to learn independently on the Internet and become the center of their educational activities in the classroom. Teachers will also be able to support students as they transition to a central position in the classroom and learn independently online. Figure 8 shows the teachers and students' evaluation of teacher role positioning in the computer network environment.

As shown in Figure 8, the average attitude of teachers and students believes that only 47.6% and 44.3% of teachers can act as direction guides in multimedia classrooms and students' online self-learning respectively. It can be seen that more than half of the teachers have almost ignored their own leading role. Figure 9 shows the teachers and students' evaluation of students' role orientation in the computer network environment.
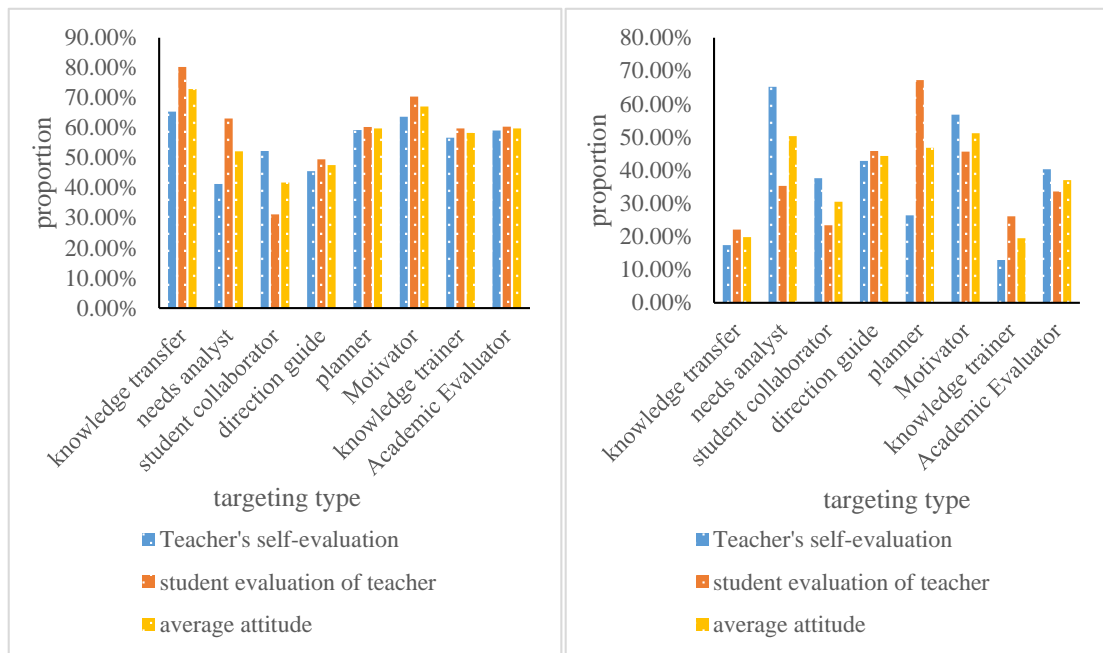
(a) Multimedia classroom based on teacher's explanation (b) Students' online self-learning environment

Figure 8: Teachers and students' evaluation of teacher's role orientation in computer network environment
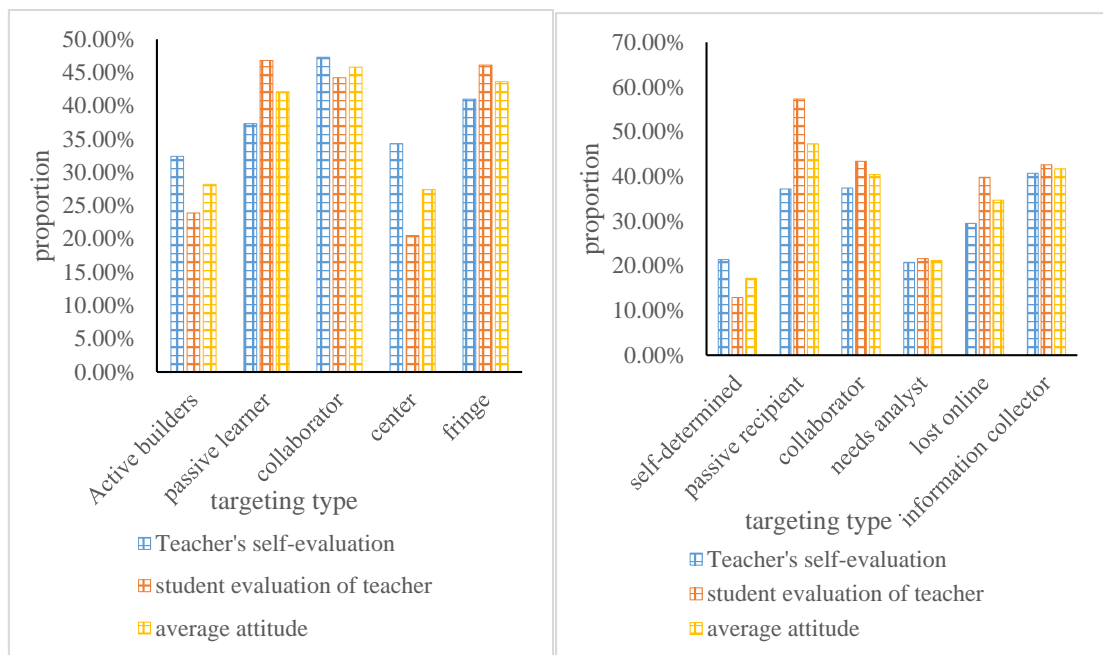
(a) Multimedia classroom based on teacher's explanation (b) Student online autonomous learning environment

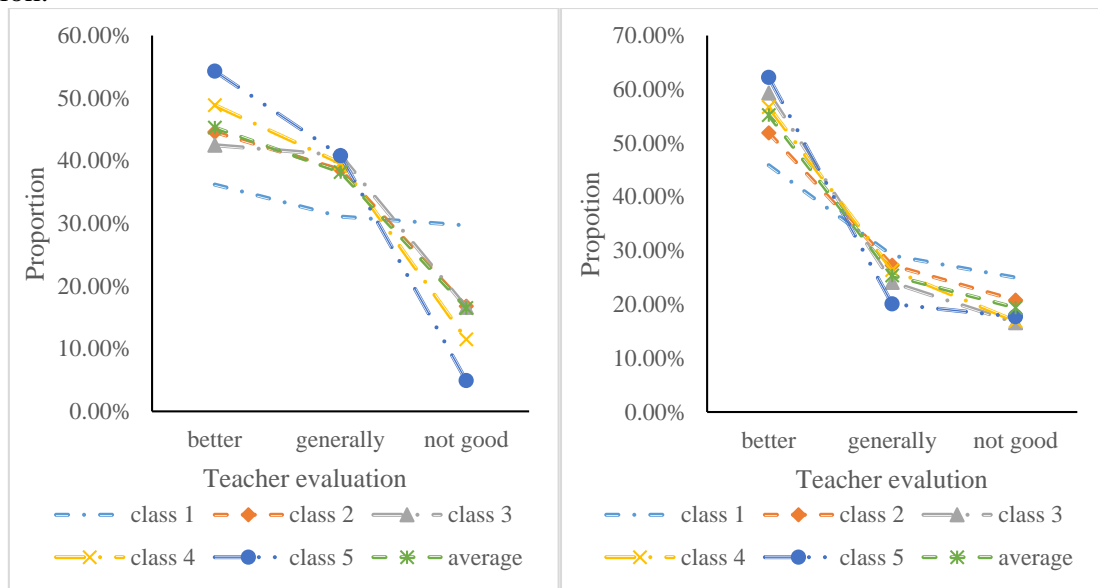Figure 9: Teachers and students' evaluation of students' role orientation in computer network environment

As shown in Figure 9, as many as 43.6% and 47.3% of the students are rated as marginalized in multimedia classroom teaching activities and passive recipients of knowledge in online autonomous learning. As a result, they are seriously lacking in the main role of learning, and their personal

learning needs are not clear. Their ability to make decisions independently is poor, and the learning process is only blindly and passively accepted. Even 34.7% of the students are rated as lost in online information, and their learning effect is even less satisfactory.

5.2 Imbalance of Teachers' Basic Literacy of Network Education Technology

The development of teachers' information literacy ability is a key factor to promote the integration of computer network technology and foreign language courses. Students' evaluation of teachers' application of computer network to teaching effect and quality ability is the most revealing. Figure 10 shows the students' evaluation of the basic quality of the school's teachers' online education.

(a) Guidance and monitoring of students' online self-learning (b) Ability to operate a computer
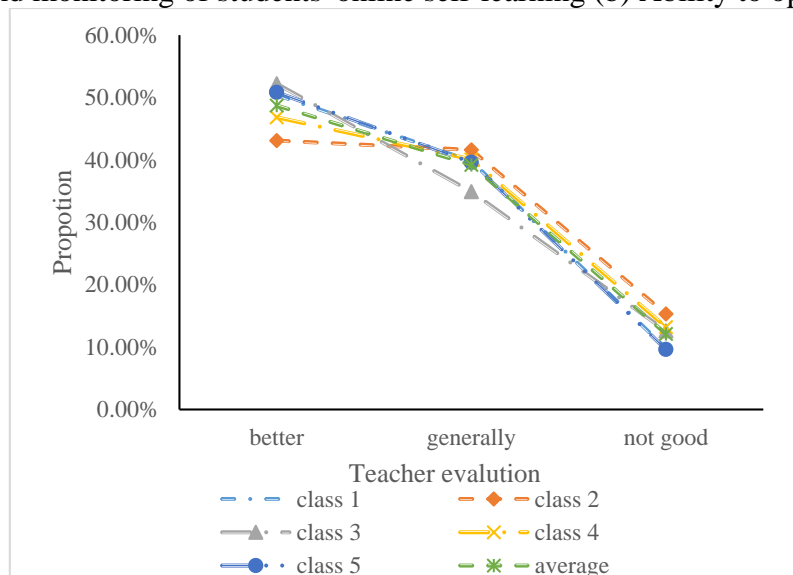
(c) Use of computers to facilitate teaching

Figure 10: Students' evaluation of the basic quality of teachers' online education in the school

As shown in Figure 10, more than half of the students have a positive attitude towards the teacher's information literacy in online education, but some students' evaluations show that the

teacher's information literacy is inferior in some aspects. For example, in students' online self-learning classroom, 38.2% of students think that teachers' ability to guide and monitor them is average, and 16.5% think that they are not good. In the multimedia demonstration class where teachers' explanations are the mainstay, 25.4% of the students believe that the teacher's ability to operate the computer is not strong, and even 19.4% of the students believe that the teacher's ability in this aspect is weak. Combined with the results of the in-depth interviews, it can be concluded that the teacher's poor computer operation ability is mainly reflected in the demonstration of teaching courseware and CD-ROM, and the elimination of machine faults. Regarding the evaluation of whether teachers can use the media to promote teaching, 39.2% of the students think that the effect is average, and 12.1% of the students think that there is almost no effect. It can be seen that the information quality of college English teachers needs to be enhanced urgently.

5.3 Dissonance between Students' Information Technology and Autonomous Learning Ability

In the network teaching and autonomous learning centered on "learning", students are required to have higher learning autonomy and self-discipline. However, surveys show that nearly half of the students are not strong in this regard. Combined with the analysis of classroom observation and in-depth interview records, from the perspective of anxiety type, degree, and cause, it statistically analyzes the anxiety of students' learning in the computer network environment. The obtained data results show that the cultivation and development of students' autonomous learning ability in this environment is affected and restricted by many factors. The results of the classification survey of students' learning anxiety in the computer network environment are shown in Table 1.

Table 1: Survey results of students' learning anxiety classification in the computer network environment

		Class 1	Class 2	Class 3	Class 4	Class 5	Average
student sex Major	male	44.2%	40.5%	51.1%	60.3%	59.3%	51.1%
	Female	36.3%	35.2%	39.8%	47.8%	50.8%	42.0%
Birthplace	Polytechnic medical	33.8%	35.4%	47.69%	59.3%	60.2%	47.3%
	Literature and History	34.4%	31.2%	50.8%	54.1%	49.4%	44.0%
student sex Major	Rural and townships	62.7%	63.4%	66.4%	69.6%	60.4%	64.5%
	city	48.3%	47.7%	52.3%	53.8%	54.1%	51.2%
Birthplace	freshman	43.8%	45.4%	47.8%	59.6%	61.4%	51.6%
	Sophomore	38.4%	35.2%	42.8%	54.1%	54.3%	45.0%

As shown in Table 1, the dissonance between students' information technology and autonomous learning ability can be divided into two categories according to their causes: On the one hand, due to the rejection of English learning itself, some students lack enthusiasm for online self-learning and are not very motivated to participate. On the other hand, due to the weak basic knowledge of English language and the difficulty of computer network operation, an average of 55.6% of the students tend to be anxious when they learn online. Even 35.9% of the students had serious anxiety and frustration and could not complete the planned learning tasks as scheduled. Table 2 shows the results of the investigation of factors influencing students' learning anxiety in the computer network environment.

As shown in Table 2, in the process of online self-learning, the anxiety level of boys in this

school is higher than that of girls. The anxiety level of science, engineering and medical students is higher than that of literature and history students, and the anxiety level of students from rural and township areas is higher than that of students from urban areas. The anxiety level of students and freshman students is higher than that of sophomore students, and the anxiety level of students with weak language foundation is higher than that of students with computer operation difficulties. It can be seen that when choosing strategies to alleviate students' anxiety, students' gender, age, origin, major and other natural factors should be comprehensively considered, and their original language foundation and computer operation ability needs to be combined in order to carry out comprehensively rational and effective adjustment.

Table 2: Investigation results of the influencing factors of students' learning anxiety in the computer network environment

	Class 1	Class 2	Class 3	Class 4	Class 5	Average
Weak English language	38.5%	32.4%	39.7%	47.6%	40.8%	39.8%
Difficulty with computer operation	39.9%	37.9%	35.1%	40.3%	31.3%	36.9%
other	21.6%	29.7%	25.2%	12.1%	27.3%	23.2%

5.4 Dissonance between Teaching Process and Teaching Evaluation

It is a trend in the development of modern education that computer assessment and evaluation system replace paper-based examinations. According to classroom observation and survey feedback, we find that students' use of the online platform is mainly based on the 4th or 6th grade simulation test or the understanding and memory practice of basic knowledge points. In this process, all evaluations of students are still the responsibility of teachers. However, the system and teachers do not give students much formative evaluation in the learning process, which makes the evaluation results highly subjective. Some students appear passive and passive or only focus on the results and despise the learning process. Combined with the results of in-depth interviews, the observation and experience attitudes of teachers and students towards teaching evaluation in the existing teaching model are shown in Table 3.

Table 3: Teachers and students' attitudes towards observation and experience of teaching evaluation in the existing teaching mode

	teacher	student	average attitude
The evaluation system is reasonable	19.4%	21.9%	20.7%
The evaluation system needs to be improved	59.8%	50.5%	55.2%
The evaluation process and results are highly subjective	20.8%	27.6%	24.2%

As shown in Table 3, only 20.7% of teachers and students in this school believe that the existing teaching evaluation system is reasonable and can objectively test the teaching situation. However, 55.2% of teachers and students believe that the current evaluation system has no effect on teaching for the time being. The overall evaluation system needs to be further improved. Even 24.2% of teachers and students believe that the process and results of the existing evaluation system are highly subjective, which has a negative impact on normal teaching.

5.5 Dissonance between Teaching Equipment and Background Management

The school's fixed language laboratory and Internet computer room are equipped with special personnel for management, but the effect of their teaching auxiliary role is not satisfactory. The evaluation of teachers and students on teaching equipment and background management is shown in Table 4.

Table 4: Teachers and students' evaluation of teaching equipment and background management

		teacher	student	average
teaching facility	Excellent equipment	22.4%	23.7%	23.1%
	General equipment	30.3%	45.1%	37.7%
	Outdated equipment	47.3%	31.2%	39.2%
Backstage management	management in place	27.4%	22.1%	24.8%
	Management is not in place	45.2%	34.5%	39.8%
	Excellent equipment	27.4%	43.4%	35.4%

As shown in Table 4, the survey results show that 47.3% of teachers are often troubled by equipment failures that affect normal teaching, which is mainly caused by the large number of machines, some outdated equipment, and the inability of personnel to manage and maintain the equipment in time. 43.4% of the students are extremely dissatisfied with the services provided by the computer room administrators. They believe that these administrators lack the necessary computer expertise. Especially when the students encounter difficulties in self-learning on the Internet, the administrators cannot provide effective technical guidance.

6. Conclusion

In the course of the vigorous college English teaching reform in China in the past ten years, the new teaching mode not only highlights the advantages, but also exposes the uncoordinated development in the process of integration. The balance of the traditional university foreign language teaching ecosystem has been broken, and the unbalanced teaching system has further led to the occurrence of many teaching disorders. These imbalances and disorders seriously restrict the progress of online foreign language teaching in China. The theoretical research on the application of computer network technology to foreign language teaching is the result of continuous optimization, combination and integration on the basis of theoretical research on various disciplines. Aiming at the scope and performance of dissonance, this paper makes an in-depth analysis using the relevant principles and laws of educational ecology, and basically finds the main reasons for various problems. The addition of information technology, a new species, not only provides opportunities for the development of modern teaching, but also leads to the imbalance of the original stable foreign language teaching ecosystem in universities. The old and new species compete and cooperate in their respective ecological niches. Only by promoting adaptation can their respective functions be linked, and the overall function of the system can be brought into full play, so that the healthy and benign development of foreign language teaching in universities can be achieved. It is an important part of rationally constructing an ecological teaching model to develop and utilize the

respective niche functions of teachers and students of key species, and to give full play to the active role of teachers and students in the whole ecosystem.

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