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Multi-Modal Teaching of English Translation in Colleges and Universities under the Network Environment

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ABSTRACT

With the overall development of the economy and technology, increasing technological products have begun to enter people's lives, and the same is true in the field of education. Due to the widespread use of multimedia, more and more educators have begun to study multimodal theory. For multimodal theory, it is mainly to accept the corresponding language, image and sound through various senses, and carry out corresponding interactive behavior. This paper analyzes the problems existing in multimodal teaching of college English translation and the actual teaching effectiveness based on the network environment. To this end, a quality evaluation system for English translation teaching based on neural networks has been designed. This system is an effective method for scoring the actual teaching process and serves as the foundation for assessing teaching quality. Meanwhile, in the experimental section, relevant experiments have been designed to conduct surveys on students 'multimodal teaching issues, aiming to understand their subjective perceptions. In the final analysis section, data analysis is performed on the actual multimodal teaching effects. Through the obtained data, the effectiveness of university English translation teaching under the network environment is analyzed and compared. The highest accuracy rate of student translations can reach 94.3%, which fully demonstrates that compared with traditional teaching methods, multimodal teaching can effectively enhance students' learning interest and corresponding translation efficiency.

Keywords: Network Environment; English Translation; Multimodal Teaching; Neural Network

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1. Introduction

Today, people all over the world are communicating with each other with increasing frequency. More and more people use English. English translation is the most basic part of the language. Therefore, as an important learning content in colleges and universities, English translation teaching directly affects students' English proficiency. However, translation teaching has always been a weak link in English teaching. Most teachers use traditional methods in translation classes. Some students find it boring. The concept of multimodal teaching based on English translation did not take shape until the new English curriculum standards for universities were introduced in China. With the advancement of technology, multimodal theory has flourished and garnered widespread attention. This theory employs language, images, and sounds to stimulate our senses of hearing, sight, and touch. It indicates that teachers should not be confined to traditional linguistic symbols and blackboard teaching methods. The application of multimodal vocabulary instruction includes non-verbal cues such as pictures, music, gestures, colors, and actions. Through these methods, the enthusiasm and learning efficiency of students in college English translation classrooms can be effectively improved. To sum up, the research on multimodal vocabulary teaching in high school is worth a try.

As the world integrates at a faster pace, language translation issues are gaining increasing attention, but they also bring about significant language translation challenges. As an international common language, English translation issues are also attracting more attention from scholars. Some studies have begun to explore the application of machine learning technology in language translation [1, 2]; Prieto LP has also investigated the application of wearable sensors and machine learning technology. He automatically extracted classroom arrangement maps (teaching activities and their social planes) based on 12 classroom conversation datasets prepared by two different teachers in different classroom environments. The dataset includes mobile eye tracking, audio-visual, and acceleration measurement data provided by sensors worn by teachers [3]. Some studies focus on the application of Internet+ in college English translation [4, 5]. Liu Hua analyzed the exploration of multimodal teaching in English and American literature courses, based on the background of Internet+. English and American literature courses encompass a broad range of subjects and require students to possess a high level of English proficiency. By constructing a multimodal teaching model that stimulates students' hearing and vision, and encourages and mobilizes students to participate in teaching interactions, teachers can help students gain more exposure to English and American literature [6]. Some studies have applied text recognition [7, 8], image recognition [9, 10] and regression models [11, 12] to college English translation, achieving good results. Based on the "Internet +" information technology, Lin Wei proposed an innovative method for a multimodal English teaching system that integrates text modality, image modality, and a regression model to distinguish teaching modes, aiming to design a more reliable theoretical paradigm [13]. Multimodal teaching methods have also inspired college English translation [14, 15]. Yang Yi pointed out that there are many shortcomings in the current college English oral teaching. On the one hand, the traditional teaching content cannot meet the students' growing practical needs, and on the other hand, students are not fully integrated into the English classroom. For this reason, he proposed an oral classroom based on multimodal teaching [16]. Some studies have suggested the application of mobile multimodal tools in college classrooms and have made progress [17, 18]. The visual grammar theory proposed by some studies provides a systematic framework for the teaching application of image modality, emphasizing the influence of visual elements, such as color and composition, on meaning construction [19, 20]. The above scholars have noticed the advantages of multimodal teaching but have not promoted it.

The problem of English translation in colleges and universities has attracted the attention of many scholars. The purpose of Ztemel F's discussion was to determine whether the universal and philosophical messages conveyed by most absurd plays are accurately presented in translation [21]. Pan J investigated how learner corpora and their research can contribute to the teaching and learning of translation and interpreting. It reviews the evolution of learner corpora in translation and interpreting training. He used data from the Chinese-English Translation Learners Corpus (CETILC), a learner corpus developed for the

study of lexical cohesion [22]. Li P explored translation policies for English translations of modern Chinese novels for American readers during the Chinese Anti-Japanese War (1931–1945). The findings suggest that translation policies may not be explicitly stated, but rather implicit in some political, diplomatic and cultural policies formulated by the US and Chinese governments [23]. Zhang X regarded translation as a cross-cultural communication activity. The paradigm and thinking of translation will also undergo profound changes in different cultural contexts. From modern translation studies, it can be seen that the translation industry attaches great importance to cultural differences [24]. The mentioned literatures have carried out detailed research on relevant English translation and multimodal teaching schemes, and they have also explained the relevant points clearly. But there is really no memorized description of how to combine the two, which is still lacking.

In daily teaching life, students' interest in learning and learning enthusiasm cannot be improved. This paper analyzes the multi-modal teaching mode in the state of network environment. It is applied to the English translation of colleges and universities, and it can improve the translation effect of students by 14.2%. It also effectively improves the efficiency of translation.

2. College English Translation Teaching Methods

2.1. Teaching Mode of Colleges and Universities under the Network Environment

(1) Network Teaching Mode

An online learning environment is an open and distributed learning environment. This environment uses the Internet and the World Wide Web and network technologies to support teaching and promote learning and meaning-making through meaningful learning activities and interactions [25].

From this analysis, teaching in the network environment can not only obtain knowledge, but also strengthen students' information technology ability [26].

(2) The Type of Teaching Mode

1) Teaching-style learning

Teaching-style learning is a relatively primitive form of teaching and learning, which generally consists of a combination of teacher teaching and student learning, with the teacher taking a leading role in the classroom. This model is more suitable for difficult teaching content.

2) Self-directed learning

In this model, students are in charge of the whole learning process and the teacher is on the periphery throughout. It pays attention to students' interest in learning, and pays attention to the process of students acquiring basic knowledge and basic skills [27].

3) Collaborative learning

Collaborative learning is when students work in groups or teams to complete common tasks. It has a clear division of responsibilities for mutual learning [28].

Then, how to choose the media mode suitable for classroom vocabulary teaching has become the focus of the next. At this point, we can use the multimodal discourse media system as a reference, as shown in **Figure 1**:

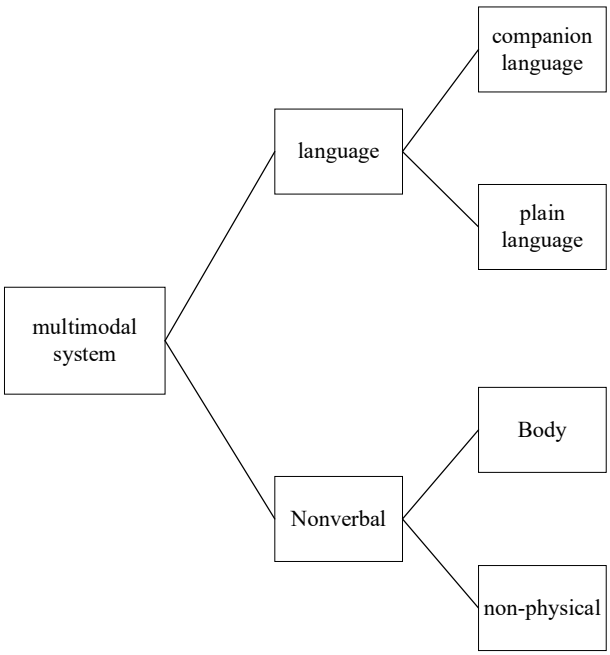

Figure 1. Multimodal Speech Media System.

(3) Thematic Teaching Mode

The subject is equivalent to the subject, and Chinese scholars have the following understanding of the meaning of the subject. Topics are valuable questions or topics that transcend and are not bounded by disciplines. It is the core of the teaching content within the teaching time limit. It covers the purpose, method, content and approach

of teaching and involves different curriculum resources. It includes textbooks, networks, practices, and other resources [29]. It organizes students around activities.

According to the concept of the network environment, the type of teaching mode and the characteristics of the topic-based teaching mode, this study defines the concept of the topic-based teaching mode for senior high school English in the network environment as: In the network teaching environment, teachers take the theme as the core. It organizes the content of English teaching in high school organically, and learners learn through autonomous and collaborative learning. It acquires English in the process of constant contact and in-depth theme activities, and it deepens the understanding of the theme [30].

(4) The Theoretical Basis of the Subject Teaching Mode of English in Senior High School Under the Network Environment

The theories that support the topic-based teaching mode of senior high school English in the network environment mainly include constructivism teaching theory, multiple intelligences theory, discourse teaching theory for language learning, and information technology and curriculum integration theory. Relevant theories of language learning define the connotation of teaching models and contribute to the development of the learning process. The theory of information technology and curriculum integration provides the basis for media selection in teaching model research [31]. The organic combination of these theories forms the theoretical basis of the theme-based teaching model, as shown in **Figure 2**. It provides an explanation of the conceptual model and process model of teaching for the construction of teaching model.

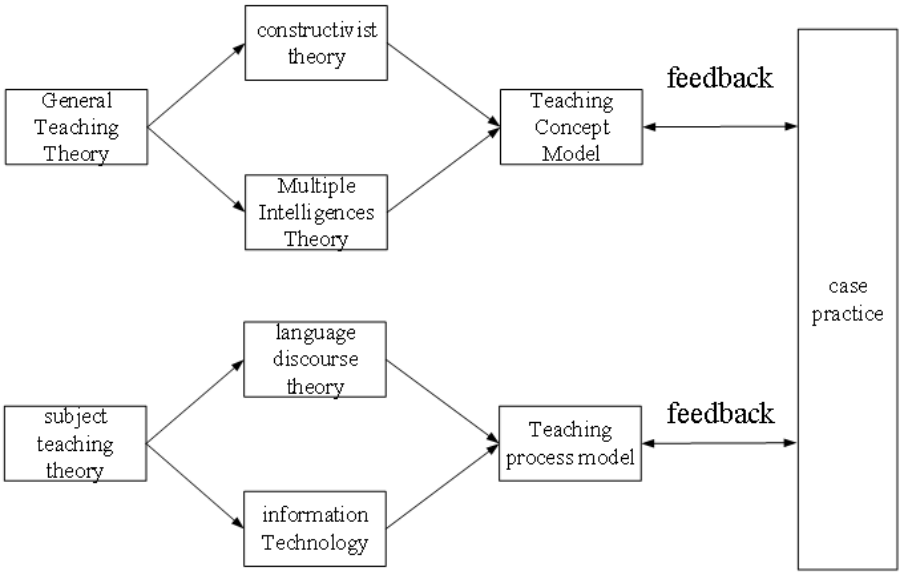

Figure 2. Theoretical System of Thematic Teaching Models.

2.2. Teaching Quality Evaluation Model Based on Neural Network

(1) Current Teaching Quality Evaluation Methods

The assessment of teaching quality in multimodal teaching of English translation in a range of higher education institutions, such as universities, is an extremely complex issue and the assessment of teaching quality can be very cumbersome. The key to the assessment of the quality of English translation teaching in the past was the establishment of indicators for the assessment, and then the next problem is grading [32].

Here we assume that when the school starts, there are N students in a certain class. The number of students with good, competitive good, average, passing and poor grades is n_i, of which:

$$i = 1,2,3,4,5 \tag{1}$$

A state vector at the beginning of school is:

$$R(1) = \left(\frac{n_1}{N}, \frac{n_2}{N}, \frac{n_3}{N}, \frac{n_4}{N}, \frac{n_5}{N} \right) \tag{2}$$

Then after the final exam, the students with excellent grades still have n_{11}. At this time, a transfer problem is designed. The transfer situation of good grades is as follows:

$$\left(\frac{n_{11}}{n_1},\frac{n_{12}}{n_1},\frac{n_{13}}{n_1},\frac{n_{14}}{n_1},\frac{n_{15}}{n_1}\right) \tag{3}$$

Similarly, we can also transfer cases for better, average, passing and poor students as follows:

$$\left(\frac{n_{i1}}{n_i},\frac{n_{i2}}{n_i},\frac{n_{i3}}{n_i},\frac{n_{i4}}{n_i},\frac{n_{i5}}{n_i}\right)(i=2,3,4,5) \tag{4}$$

This gives the corresponding transition probability matrix:

$$p=(p_{ij})=\left(\frac{n_{ij}}{n_i}\right)(i,j=1,2,3,4,5) \tag{5}$$

Then a quantitative value of the teaching effect is obtained according to the probability matrix:

$$s=90x_1+80x_2+70x_3+60x_4+50x_5 \tag{6}$$

(2) Neural Network

As shown in **Figure 3**, the MP model structure presents multiple inputs and one output [33]. The MP model is the earliest mathematical model of artificial neurons, simulating the activation mechanism of biological neurons through binary input/output. Its core is threshold logic: when the weighted sum of inputs exceeds the threshold, the output is 1; otherwise, it is 0, laying the theoretical foundation for modern neural networks.

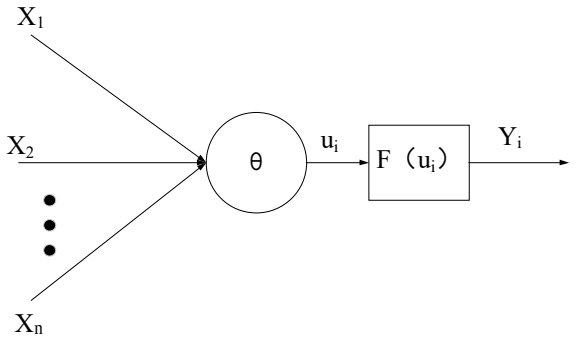

Figure 3. MP Model Structure.

In the above process, if we need to process data from multiple sources, then we can add multiple layers of processing units to form a multi-layer sensing unit, also known as a multi-layer feed-forward network. **Figure 4** shows the structure of a multi-layer sensing unit [34].

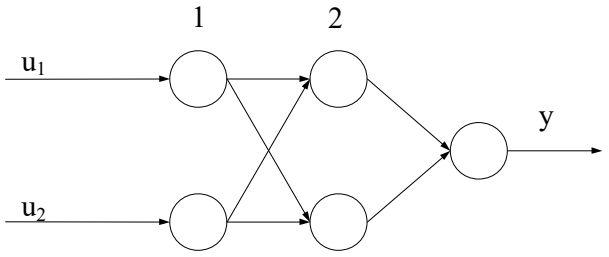

Figure 4. Multi-Layer Perception Unit Structure Diagram.

(3) Types of Excitation Functions Commonly Used by Neurons

The expression of the hard limit function is:

$$y=f(u)=1,u\geq 0 \tag{7}$$

$$y=f(u)=0,u<0 \tag{8}$$

Or

$$y=f(u)=\mathrm{sgn}(n)=1,u\geq 0 \tag{9}$$

$$y=f(u)=\mathrm{sgn}(n)=-1,u<0 \tag{10}$$

In the formula, *sgn(·)* is the sign function.

For the above two formulas, the curve of the hard limit function is shown in **Figure 5**.

If the excitation function adopts a linear function, the output y of the neuron takes the output u of the basis function:

$$y=f(u)=u \tag{11}$$

The curve of the linear function is shown in **Figure 6**.

In this process, if the linear function is fitted infinitely to the excitation function, the output y of the neuron is:

$$y=f(u)=\frac{1}{2}(|u+1|-|u-1| \tag{12}$$

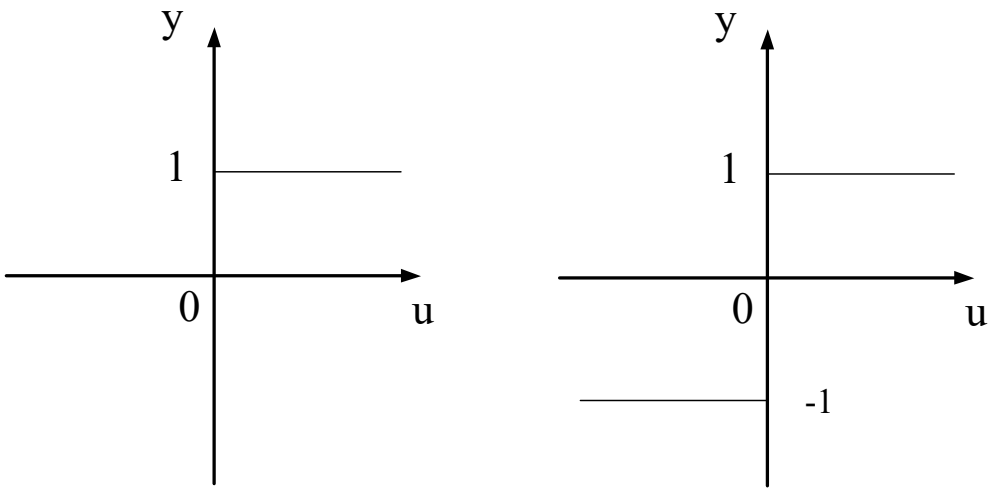

Figure 5. Single and Double Limit Function Curves.

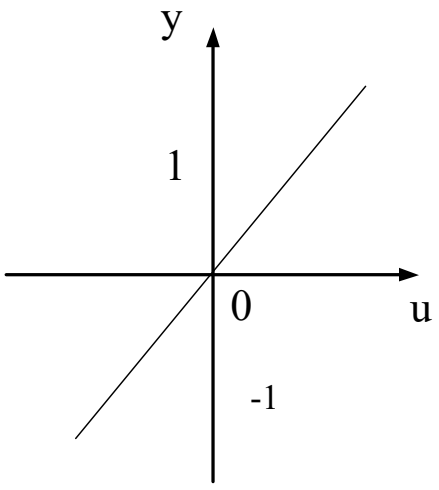

Figure 6. Linear Function.

The mathematical representation of the Sigmoidal function is:

$$y = f(u) = \frac{1}{1 + e^{-\lambda u}} \tag{13}$$

Or

$$y = f(u) = \frac{1 - e^{-\lambda u}}{1 + e^{-\lambda u}} \tag{14}$$

Gaussian function is also an important kind of excitation function, and its expression is:

$$y = f(u) = e^{-\frac{u^2}{\sigma^2}} \tag{15}$$

σ is the expansion factor, among them, the larger the σ, the more straight the curve will be; the smaller the σ, the more vertical the curve will be.

2.3. Multimodal Teaching Methods

The theoretical foundation of multimodal teaching can be traced back to the theory of multimedia learning cognition, which emphasizes promoting learning outcomes through the synergistic effect of visual and auditory channels. At the same time, sociolinguistics provides a framework for multimodal teaching, positing that meaning is constructed through multiple symbolic modes such as language, images, and sounds. This paper's multimodal teaching method integrates these two theories, aiming to optimize students' English translation learning experience through multisensory stimulation.

This article first distinguishes between the meaning of "medium" and "modal". The medium refers to the intermediary that builds a bridge between the information transmitter and the information receiver, which can generally be a person, an organization, or an object that transmits information (such as a note, a projector, a chart, etc.). The term "modal" was originally used in the field of atmospheric science to indicate the basic shape of the system, and it was also called "wave mode" [35]. Now, not only the field of atmospheric sciences mentions modality, but other fields (such as structural engineering, medicine,

philosophy, linguistics, etc.) use the term "modality". Different fields define "modality" differently. Therefore, the two refer to different, and the modal is the form that presents the basic activity at a certain moment. Since different fields have different definitions of "modality", different scholars hold different views on the definition of multimodality:

Combined with relevant data, it can be considered that multimodality is a combination of multiple symbolic modalities that appear in communication. The combination of these modalities generates different meanings. It mainly includes visual meaning (image, page size, font color, etc.); audio meaning (song length, sound effects, etc.); gesture meaning (body movements, senses, etc.), spatial meaning (living space, architectural space), etc. Therefore, in the process of language teaching and learning, different people tend to choose different modalities, and thus bring different effects [36].

The proposal of multimodal teaching is completed on the basis of multimodal discourse analysis research. In 1996, members of the new London group first began to study how multimodal theory could be applied to language teaching. They pointed out that "in the process of language teaching, the main task of teaching is to cultivate students' multi-literacy ability and multi-modal meaning". Multimodal teaching advocates the proper use of multimodal symbolic resources in practical teaching and makes them influence each other. Only in this way can the expression of discourse meaning be expanded, and the enthusiasm and initiative of students can be stimulated. In multimodal teaching, learners perceive, understand, encode and store knowledge entered in the classroom. The information stored in their brains then forms the basis for output, and these form a knowledge loop. This circulatory system promotes comprehension and retention of language acquisition.

In the classroom, the designers of discourse meaning are teachers and students. Meaning generation is accomplished through the continual selection and re-selection of sources about personal experience and background. A meaning-design perspective means that students can select resources from a range of available resources. Therefore, the way students convey their meaning may be limited by factors such as available symbolic resources and students' design strategies. This can be called "usable design" by the New London group. Available design refers to the symbolic resources available in a teaching environment (such as text, video, interactive tools) that students construct meaning by selecting and organizing these resources. These choices can provide teachers with valuable information about student learning and its characteristics, and have implications for teaching, curriculum, and assessment practices. In the process of choosing design meanings, certain modes appear to be more suitable for specific uses than others. For example, the effect of text display is better for conveying details, while diagrams and tables seem to be better for conveying ideas. Similarly, video and animation seem to be more suitable for orderly "behavioral" information, while audio seems to be more suitable for stimulating the imagination. The learning process of students is a process of meaning generation. In the process of learning how to make and express meaning, students consciously choose some tools to aid their generation, which are reinforced by the tasks assigned by teachers. Today, the learning process and classroom practice must remain connected to students. Students' learning process is enriched by new technologies. Teachers must consider how they will infuse their classrooms with new technologies and a range of digital media learning tools. This suggests that once teachers have decided which measures are likely to benefit their students, they can use these measures in student learning to improve student achievement.

3. Multimodal Teaching Situation Investigation Experiment

In order to better explore the application status of multimodal teaching in English classrooms, the research is aimed at the multimodal teaching situation in college classrooms and the attitudes of students and teachers towards multimodal teaching.

3.1. Questionnaire Survey Experiment Process

Both interviews focused on students and teachers, followed by interviews to collect questionnaires. We randomly select students and teachers from different classes for interviews to gather information immediately. Teach-

ers come from a variety of ages and teaching experiences. The purpose of the interview was to understand their own thoughts on the multimodal English class and their feelings about using multimodal teaching. They made many effective suggestions immediately. Student interviews are about their teachers and provide some advice for their teachers. Their suggestion is to use multimodality in the classroom. All of these questions will be asked at the end of the interview.

A total of 313 questionnaires were distributed, but only 302 were received. There were 147 boys and 155 girls. Of these, 96 were freshmen, 102 were sophomores, and 104 were juniors. The questionnaire uses a Likert 5 scale, and its reliability was tested through a pre-test with an Cronbach's α coefficient of 0.82 (>0.7), indicating good internal consistency. Content validity was assessed by three English education experts, who recognized the relevance of each item to multimodal teaching. The formal questionnaire consists of 22 questions, divided into three dimensions:' Current Teaching Status, '' Student Attitudes, 'and' Teaching Impact. **Table 1** shows the detailed information table of teachers' use of multimedia in the classroom.

Table 1. Detailed Information Table of Teachers' Use of Multimedia in the Classroom.

	Frequency	Percent	Valid Percent	Cumulative Percent
Often	165	54.6	54.6	54.6
Sometimes	88	29.1	29.1	83.8
Less	48	15.9	15.9	99.7
Not at all	1	3	3	100
Total	302	100	100	

From **Table 1**, we can see that 54.6% of the teachers pointed out in the first part use multimedia frequently in the classroom. They often use PowerPoint courseware for body language, drawing, and multimedia videos during the teaching process. 29.1% of teachers use multimedia sometimes in the classroom. 15.9% of teachers do not use it in teaching sometimes. Only 1% of teachers do not use multimedia teaching in the teaching process. At the same time, a statistical survey was conducted on teachers' PPT usage during class, and the statistical results were summarized as shown in **Table 2**:

From the data in **Table 2**, we can see that 51.7% of students like it, and only 8.3% of students don't like it. 27.2% of students don't care about it, and 12.9% don't know if they like it.

Table 2. The Situation of Students When Teachers Use PPT in Class.

	Frequency	Percent	Valid Percent	Cumulative Percent
Like	156	51.7	51.7	51.7
Dislike	25	8.3	8.3	59.9
Not matter	82	27.2	27.2	87.1
Not sure	39	12.9	12.9	100.0
Total	302	100.0	100.0	

3.2. Investigation of Multimodal Teaching in Classroom under the Network Environment

In the network environment, an investigation experiment was conducted on the improvement of multimodal teaching in college English translation classrooms. This paper investigates teachers' classroom multimedia teaching and related multimodal PPT usage. It summarizes the relevant data, and the detailed information table for teachers' multimedia teaching in the classroom is shown in **Table 3**:

Table 3. Multimedia Teaching Information.

	N	Percent	Percent of Cases
Newlesson	217	23.9%	71.9%
Read	140	15.4%	46.4%

Table 3. *Cont.*

	N	Percent	Percent of Cases
Practice	114	12.6%	37.7%
Grammar	198	21.8%	65.6%
Writing	120	13.2%	39.7%
Else	119	13.1%	39.4%
total	908	100.0%	300.7%

From **Table 3**, we can see that 23.9% of the teachers used multimedia teaching in the new curriculum, and 21.8% used multimedia teaching in the grammar part. Multimedia teaching plays an important role in reading, practice, writing and other teaching courses.

3.3. Survey of Students' Attitudes Towards Multimodal Teaching

It can be seen from the above related surveys that for teachers in the actual teaching process, the effect of a multimodal teaching method is still good. In order to have a better understanding of an intuitive feeling of students in multimodal teaching, an experiment was designed to investigate it. It summarizes the survey results statistically, as shown in **Table 4**:

Table 4 is about students' attitudes towards the teacher's multimodal teaching style. From the statistics of the survey results, it can be seen that more than half of the students believe that their teacher's multi-modal teaching method is very good. Only 3.0% of students felt that their teacher's multimodal teaching approach was not good. 15.6% of students think the teacher's method is not the best or the worst. At the same time, a survey was conducted on whether the multimodal teaching method could help students improve their interest in English translation. The results of the survey are shown in **Table 5**:

Table 4. Students' Attitudes Towards Multimodal Teaching.

	Frequency	Percent	Valid Percent	Cumulative Percent
Better	115	38.1	38.1	38.1
Good	131	43.4	43.4	81.5
General	47	15.6	15.6	97.0
Not good	9	3.0	3.0	100.0
Total	302	100.0	100.0	

Table 5. The Improvement of Students' Interest in English Translation by Multimodal Teaching Methods.

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	157	52.0	52.0	52.0
Disagree	14	4.6	4.6	56.6
Not sure	94	31.1	31.1	87.7
Do not	37	12.3	12.3	100.0
Total	302	100.0	100.0	

Regarding the method of multimodal teaching, it enhances students' interest in learning English and keeps learning English. From **Table 5** we can see that more than half of the students agreed with this idea. Only 4.6% of students disagreed. 31.1% and 12.3% of the students think that they do not know whether it is good or not and whether it is suitable for students.

From the above points, we can know that most students prefer multimodal teaching to traditional teaching. Most of them have a positive attitude towards multimodal teaching.

4. Multimodal Teaching

4.1. Results of Pre-Test and Post-Test

Through the analysis of empirical research data, it

shows that teachers should stimulate the motivation of students to learn English translation and make students interested in English vocabulary learning. At the same time, teachers should adopt corresponding vocabulary teaching methods for students in different situations. In addition, in terms of English vocabulary learning strategies and learning concepts, teachers should guide students to learn English vocabulary more effectively with a positive attitude and attitude.

In the part of vocabulary test, this paper selects two students from the first grade of senior high school as the test objects. It is two tests of pre-test and post-test of vocabulary for students. And this paper summarizes the relevant results as shown in **Figure 7**:

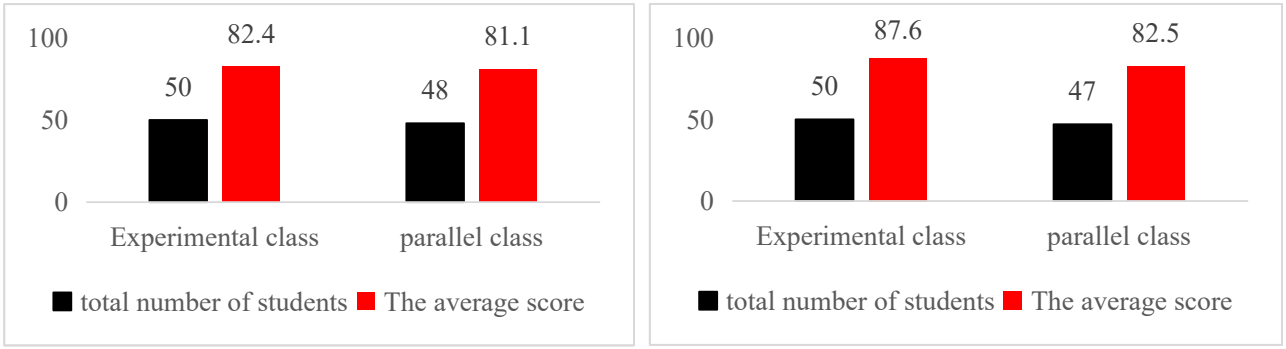

Figure 7. Statistical Chart Comparing Students' Performance Between the Two Times.

By comparing the above vocabulary scores, we can draw conclusions. Under the traditional teaching method in parallel classes, there is little difference between the two vocabulary scores of the pre-test and the post-test. However, under the teaching method combining multimodal theory and vocabulary teaching in the experimental class, there is a significant difference in the two scores of the experimental class. At the same time, this paper let the two classes in the pre-test and post-test take the monthly test and the final test to observe the changes of their scores respectively. This paper analyzes its related multimodal teaching effect, as shown in **Figure 8**:

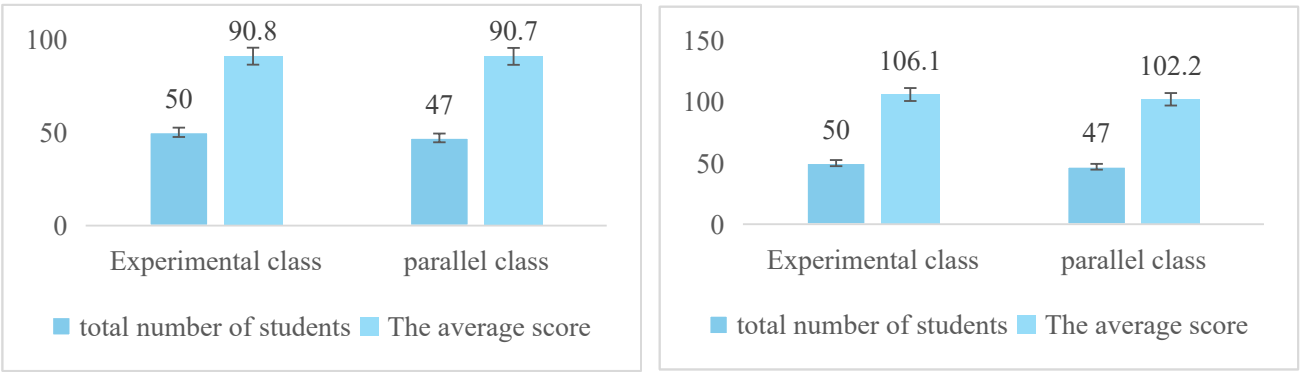

Figure 8. Changes in the Scores of the Two Classes Before and After Multimodal Teaching.

After the post-test, the average score of the experimental class was 3.9 points higher than that of the parallel class. This shows that the difficulty of the test paper is relatively moderate, but the scores of the experimental class are significantly higher than those of the parallel class. Statistical results show that after the students in the experimental class have been taught vocabulary under multimodality, their performance has been significantly improved. And vocabulary acquisition also led to the improvement of the ability of other English items.

4.2. Neural Network Simulation Training

The neural network adopts a three-layer fully connected structure (5 nodes in the input layer, 10 nodes in the hidden layer, and 1 node in the output layer), using the Sigmoid activation function (λ=1.0). The training cycle is 1000 times, with a learning rate of 0.01. After data standardization, 70% is used for training and 30% for validation. The random seed is fixed to 42 to ensure reproducibility.

In order to understand the training of the teaching quality evaluation system based on neural network, this paper uses a set of data samples to train it. And some of the numerical values are the most simulated, and this paper takes the corresponding evaluation target as the output expected value. The error of the target is only 0.0001. And the program is written by matlab to train it. The obtained training simulation results are shown in **Figure 9**:

It can be seen from the above results that the predicted value of the neural network after training has a certain error with the evaluation result of the original data. However, the error is within an acceptable range. The main reasons for the above error are as follows:

(1) The coverage of the evaluation indicators is not comprehensive enough, and there are errors in the subjective evaluation of the evaluation subject.

(2) The algorithm itself has certain limitations, such as difficult to ensure convergence, slow convergence and so on.

According to the above analysis, it can be seen that the algorithm-based neural network teaching quality evaluation model can more accurately evaluate the teaching quality.

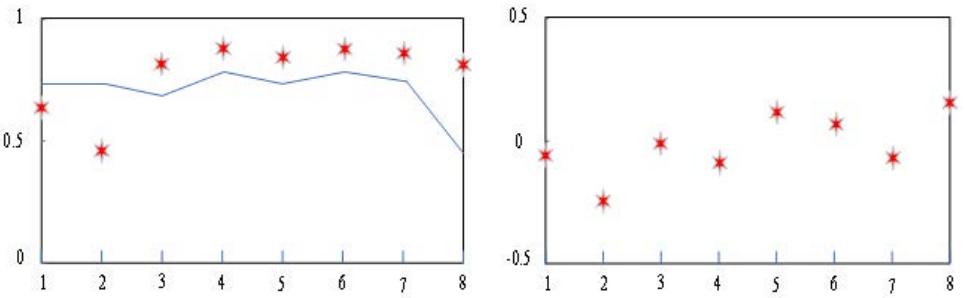

Figure 9. Comparison of Neural Network Simulation Results.

4.3. English Translation Multimodal Teaching Results

In order to have an intuitive understanding of the effect of multimodal teaching of English translation, this paper designs four different groups. It adopts the traditional teaching method and the multi-modal teaching mode in the network environment respectively. This paper compares the English translation teaching effects of the two groups, and draws the relevant data into **Figure 10**.

From **Figure 10**, we can see that the number of translations in the four groups in the traditional teaching mode and the multimodal teaching mode is the same, 200, 300, 150, and 250, respectively. However, under the traditional teaching mode, the translation accuracy rate of students in group one was 75.2%. The translation accuracy rate of students in group two was 77.9%; the translation accuracy rate of students in group three was 71%; and the translation accuracy rate of students in group four was 79.7%. In contrast, students in the multimodal teaching mode: the translation accuracy rate of students in group one is 87.8%; the translation accuracy rate of students in group two is 89.1%. The translation accuracy rate of students in group three is 91%; the translation accuracy rate of students in group four is 94.3%.

Based on the above analysis, it can be seen that under the premise of the same number of translations, the translation effect of students under the traditional teaching mode is not as good as that of students under the multimodal teaching mode. The translation accuracy rate of students in the multimodal teaching mode is increased by 14.2%, which can effectively improve translation efficiency.

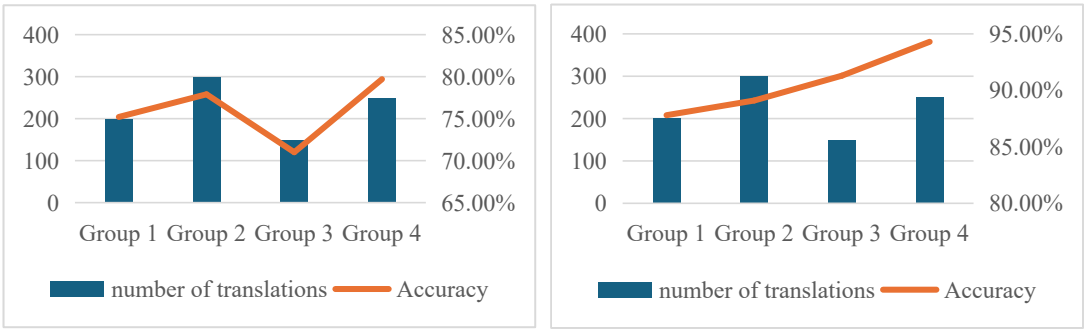

Figure 10. Comparison of Traditional Teaching and Multimodal Teaching Modes.

Table 6 systematically compares the core features of three modern English teaching methods based on educational theory and empirical research. In terms of theoretical foundation, multimodal teaching relies on multimedia cognitive theory, flipped classroom is based on constructivism, and gamification teaching originates from self-determination theory. In terms of cognitive load, multimodal teaching optimizes learning efficiency through dual-channel processing, flipped classroom leads to higher load due to pre-class learning tasks, and gamification teaching needs to balance mechanism and content. There are significant differences in technical requirements: multimodality relies on basic multimedia equipment, flipped classroom requires support from learning management system, and gamification requires dedicated platform construction. In terms of teacher-student interaction mode, multimodal teaching provides real-time multisensory feedback, flipped classroom focuses on asynchronous communication, and gamification emphasizes immediate reward mechanism. Applicability analysis shows that multimodal teaching is particularly suitable for skill-based courses such as translation, flipped classroom is more suitable for theoretical teaching, and gamification is suitable for repeated training scenarios. Empirical effect data show that the teaching method of this study improves translation accuracy by 14.2%, which is better than the 9.1% benchmark value of flipped classroom. Gamification performs well in improving motivation, but the learning effect is unstable.

Table 6. Comparative Analysis of Modern English Translation Teaching Methods.

Dimension	Multimodal Teaching (This Study)	Flipped Classroom	Gamification
Theoretical Basis	Multimedia Learning Theory	Constructivism	Self-Determination Theory
Cognitive Load	Dual-channel processing	High (pre-class load)	Medium
Technical Needs	Multimedia equipment	LMS + micro-lectures	Gamification platforms
Teacher-Student Interaction	Real-time multimodal feedback	Asynchronous communication	Instant reward system
Applicability	Skill-based courses	Theory-focused courses	Repetitive training
Empirical Results	14.2% accuracy improvement	9.1% average improvement	Motivation boost
Implementation Challenges	Teacher multimodal literacy	Student self-discipline	Goal-mechanism balance

5. Discussion

Multimodal teaching has brought about significant changes to English translation classes in universities, but its full implementation still requires educators to find a balance between resource integration, technology application, and teaching evaluation. Course design needs to break away from the traditional single-text model and introduce dynamic resource libraries. Teachers can establish categorized material repositories (such as TED talk videos, bilingual documentaries, interactive translation platforms) and match corresponding multimodal materials for different translation topics (such as business, literature, science), enabling students to understand language differences in real contexts. At the same time, the selection of technical tools should focus on ease of use and interactivity, such as using Padlet collaboration walls for real-time translation discussions or providing instant feed-

back through AI-assisted tools (like DeepL, Grammarly), reducing students' fear of difficulties.

The promotion of multimodal teaching faces practical challenges. On one hand, teachers need systematic training to skillfully operate the tools and understand the cognitive principles of modal combination (such as avoiding visual and auditory information overload). On the other hand, students may encounter adaptation barriers due to technical barriers or differences in learning habits. To address this, it is recommended to adopt a progressive strategy: initially focusing on "text + image," gradually incorporating audio and video tasks, and ultimately transitioning to virtual simulation translation scenarios. Additionally, a multimodal teaching evaluation system should be established, not only focusing on translation accuracy but also tracking students' cognitive load and emotional experiences through questionnaires and interviews, to prevent technology from overshadowing the educational process.Educators can implement multimodal English translation teaching through the following steps: integrate diverse resources (such as videos, audio, and interactive software), and use tools like Canva or Prezi to design multimodal courseware; alternate between visual (charts), auditory (voice-over), and tactile (group collaboration tasks) modes in class to enhance students' multi-sensory engagement; evaluate learning outcomes in real-time via online platforms (such as Kahoot!) and dynamically adjust teaching strategies. It is recommended to regularly collect student feedback and optimize the combination of modalities, for example, by adding situational simulation exercises for translation challenges to ensure that instruction meets student needs.

6. Conclusions

The main research content of this paper is the problem of college English translation under the network environment. How to improve teaching philosophy by teaching a multimodal approach to translation, enhance students' interest in learning, and improve translation efficiency are the focus of the research. For this reason, this paper firstly introduces a teaching quality evaluation system based on neural network system, so as to conduct a professional evaluation on the effect of the teaching method before and after improvement. In this paper, a questionnaire survey experiment is designed in the experimental part. This paper investigates the frequency of use of multimodality and students' feedback on the current high-efficiency English translation classroom in China in an online environment. Next, in the analysis part, this paper analyzes the relevant results and draws conclusions. Finally, through the translation efficiency of students, it can be concluded that the use of multimodal teaching methods can effectively improve students' English translation effect. This study has certain limitations, with a small sample size and focusing solely on Chinese college students. The generalizability of the conclusions may be influenced by cultural or educational system differences; the experiment was not fully randomized, although control variables were matched at baseline, potential selection bias still needs attention. Future research could expand to cross-cultural samples and use randomized controlled trials (RCTs) to further validate the applicability of multimodal teaching.

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Conflicts of Interest

The authors declare no conflict of interest.

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