Construction of a Multimedia Instructional Effect Assessment System of College Foreign Language Translation Based on Artificial Intelligence

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ABSTRACT

The teaching evaluation module is an important guarantee of teaching effectiveness, and as an important part of the multimedia teaching system, it needs special attention. This paper combines artificial intelligence and multimedia teaching effect evaluation, proposes a foreign language translation multimedia teaching effect evaluation model based on improved support vector machine (SVM) algorithm, and provides theoretical support for the construction of foreign language translation multimedia teaching effect evaluation system. The results show that the accuracy of this assessment algorithm is improved by 22.18% compared with the traditional assessment algorithm. Therefore, it is theoretically feasible to use the improved SVM to analyse the application effect of multimedia teaching mode in foreign language translation teaching. It can be found that the automatic acquisition of model data, the cumulative search of spatial knowledge and the adaptive control of the search phase of the optimised SVM algorithm have also been significantly improved, and conclusions drawn are more reliable.

KEYWORDS

Artificial Intelligence, Instructional Effect, Modeling, Multimedia, Support Vector Machine, Translation Teaching

With the development of globalization, foreign language teaching has become an increasingly important field of education. However, the traditional foreign language teaching model has many problems, such as insufficient classroom interaction and difficulty in evaluating teaching effectiveness. The application of multimedia technology has brought new opportunities and challenges to foreign language translation teaching. In recent years, artificial intelligence technology and multimedia teaching methods have been introduced into foreign language teaching to address these issues. These emerging technologies have brought new teaching modes and methods to foreign language teaching, as well as new challenges. This article proposes a multimedia teaching effectiveness evaluation model for foreign language translation based on an improved SVM algorithm to address the evaluation issues in foreign language translation teaching. This model combines artificial intelligence technology with

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multimedia teaching and has achieved significant results in evaluating the effectiveness of foreign language translation teaching. Research has shown that the improved SVM based evaluation model outperforms traditional SVM in terms of time measurement accuracy and efficiency. The research results of this article indicate that the improved SVM algorithm can efficiently and fairly reflect the teaching effectiveness of schools and provide important reference opinions for educators. The research findings of this article will provide valuable references for the improvement and optimization of foreign language translation teaching.

This article improves the SVM algorithm and applies it to constructing multimedia instructional effect assessment systems of foreign language translation in universities. The main innovations and contributions of this research are as follows:

1. In this article, following the principle that the most easily segmented class is separated first, the existing binary tree SVM multi-classification algorithm is optimized, and a new SVM multi-classification method is proposed.
2. Applying the improved multi-classification algorithm to the university assessment system, a multimedia instructional effect assessment model of foreign language translation in universities based on an optimization algorithm is proposed, and good results are obtained through experiments.

This article begins by introducing the research background, purpose, methods, significance, and innovative points of this article. Then, following a literature review on the relevant status of multimedia teaching, the next sections provide a detailed introduction to the multimedia teaching mode, SVM algorithm, and SVM-based multimedia teaching effectiveness evaluation model. Then, a corresponding analysis of the experimental results and a relevant analysis of practical applications are provided. The conclusion section summarizes the entire research and proposed future development directions.

LITERATURE REVIEW

With the rapid growth of the Internet, the current network has been applied to many aspects of people's lives, such as education, work, and life. All kinds of network resources have also been applied to the instructional stage, making the instructional materials richer and the instructional stage livelier and more interesting (Liu, 2021). The spread of the new epidemic has caused great damage to people's life safety and social production. Offline education will make people gather, increasing the risk of virus transmission. Based on this, large-scale online teaching and online learning courses played an extremely important role in a severe epidemic. As a compulsory course for senior English majors, Translation Theory and Practice aims to help students better understand the past and present situation of translation theory and practice, have basic translation theory literacy, and enhance their translation practice ability (Gren, 2020). With the help of multimedia teaching power, vivid video materials and real and intuitive translation scenes come into the classroom of translation teaching in universities so that students can easily get rid of the limitation of time and space and participate in the real scene of translation in person. Now, with the deepening of instructional reform, instructional effect has become the essential for a school's survival and development. Instructional assessment module is an important guarantee of instructional effect, and as an important part of the multimedia teaching system, it needs special attention (Ting, 2021).

In multimedia teaching, student attention is more concentrated, teachers can explain knowledge points in detail in a limited time with the help of various multimedia technologies and resources, and these instructional materials can be made into electronic courseware, which is convenient for students to transfer and share, so that students can consolidate their knowledge content after repeatedly playing various multimedia videos, thus improving their learning efficiency (Sun et al., 2022). To build a complete and reasonable instructional effect assessment system online, although the assessment standard of instructional effect has a certain subjective consciousness, the internal objective law is still worth studying, and there are rules to follow(Zhen, 2021). An efficient and fair reflection of the instructional effect of the school can not only play a role in supervising the teaching but also improve the instructional effect after the feedback of the assessment and analysis results (Alkateeb, 2023).

The multimedia teaching and evaluation system, as a component of instructional media, is not only a good content channel but is also instantly accessible from anywhere (Lin, 2021). It aids in creating a productive conversation area for students, professors, and other students because it has opened up numerous communication channels (Koka, 2024). Chen believes that instructional assessment, as an important part of the modern education system, is not only to assess the teaching results but also to make dynamic assessments of the whole stage of education (Novawan et al., 2024). Therefore, it can be divided into three aspects: summative assessment, preparatory assessment, and formative assessment. Jiménez (2024) improved the traditional assessment method, started with the data source mining and assessment algorithm, and designed the learning effect assessment algorithm that can be used in online teaching (Jiménez, 2024). The multimedia interactive information system designed by Bond et al. (2024) aims to combine the relevant characteristics of higher education and provide an effective solution to improve the utilization of higher education and teaching resources and improve the instructional effect of higher education (Bond et al., 2024). Matthew believes the instructional stage is an organic whole composed of many variable factors, among which the most important factors are teachers, classmates, tutorials, learning environment, lecture methods, and classroom feedback. All these factors affect the quality of teaching in different forms and degrees (Zhang et al., 2024). Therefore, some important factors should be included in the instructional assessment (Rahiman & Kodikal, 2024).

Chang et al.(2024) proposed a binary tree support vector multi-classification algorithm based on the shortest distance, which uses Euclidean distance between classes to determine which classes are separated first (Chang et al., 2024). Khrapatyi et al. (2024) used the similarity recursion method to combine categories pairwise according to the similarity of samples in the training stage and finally generated an SVM binary decision tree. Khrapatyi et al. (2024) proposed a binary tree SVM multi-classification algorithm based on the minimum hypersphere radius (Khrapatyi et al., 2024). Weidener & Fischer studied the theory and structure of SVM, learned the application principle of SVM in multi-class classification, and analyzed and compared the existing multi-class classification algorithms based on SVM from many aspects (Weidener & Fischer, 2024).

Instructional effect assessment is a basic part of teaching activities, aiming at improving instructional effect and perfecting the education system (Weidener & Fischer, 2024). Contemporary instructional effect assessment criteria point out that instructional assessment cannot be simply understood as the assessment of teaching results, and the object of assessment should cover all links of the whole of the teaching work to realize systematic and dynamic analysis. Based on traditional instructional effect assessment methods, this article puts forward an improved SVM-based multimedia instructional effect assessment model. It tests the multimedia teaching data of foreign language translation with this method (Cui, 2024). The results show that this method has good performance and can be used as an effective means to assess the multimedia instructional effect of foreign language translation in universities (Dai et al., 2024).

RELATED MATERIALS AND METHODS

Multimedia Teaching Mode

Under the background of quality teaching, changing the traditional teaching idea and instructional mode plays a very important role in improving student interest and giving full play to their initiative. In foreign language translation teaching, teachers should constantly innovate teaching methods. For example, create some interesting scenes in the classroom, let students enter the classroom with curiosity, and give them more opportunities to participate actively to strengthen their understanding and application of various foreign language translation skills. In the stage of foreign language translation teaching, a situational teaching method is often needed. Teachers should transform all kinds of abstract knowledge into situational content so students can understand all kinds of knowledge more thoroughly. In order to create situations, many teachers use multimedia technology to show some foreign language translation skills with concise electronic courseware. With the help of English videos, students can experience English culture, thus realizing situational teaching.

On the basis of correct material selection and courseware development, it is the fundamental purpose of multimedia teaching to reasonably apply multimedia courseware to translation teaching to achieve the expected instructional effect, which reflects the advantages of integrating information technology and education. Multimedia instructional mode and the application of various video resources make foreign language translation teaching easier. Students learn in the stage of entertainment and practice the concept of entertaining. With multimedia technology, students can learn all kinds of knowledge more easily. Teachers can also give students more electronic courseware and some English learning resources and gradually change their learning methods. Using multimedia courseware not only greatly enriches the content of instructional materials and expands the teaching capacity but also enhances student interest in learning. It plays an important auxiliary role in classroom teaching. It overcomes the shortcomings of small teaching capacity and single teaching methods of foreign language translation courses in the past.

Strictly speaking, multimedia technology is not only a technology but also a tool. With the wide application of multimedia, multimedia teaching has been popularized, and integrating multimedia technology with other information technologies has provided more abundant resources for the instructional stage. The selection of multimedia content must closely follow the content of instructional materials, be auxiliary to the instructional materials, be consistent with the teaching content, and be the extension and deep expansion of the teaching content. In addition, teachers should distinguish between primary and secondary; multimedia audio and video materials are auxiliary teaching services, so the time control is very strict. As far as foreign language translation is concerned, the teaching focus is student translation levels. In order to enable students to have an understanding of English culture after graduation and realize the translation of various texts, it is necessary to reform the traditional educational concept. At present, although many schools are carrying out instructional reforms, some teachers do not know the new teaching concepts in place and still adopt traditional methods to teach foreign language translation. Under the modern teaching idea, we should innovate the traditional idea, fully use other teaching techniques and methods in the limited classroom time, and nurture the whole student.

The SVM Algorithm

The *SVM* (*support vector machine*) is a machine learning algorithm widely used in pattern recognition and classification problems (Chen et al., 2024). The basic principle is to separate data samples of different categories by constructing a decision boundary. SVM can effectively handle high-dimensional feature spaces and nonlinear classification problems (Buzdar, 2024). The core idea of SVM is to find an optimal hyperplane that maximizes the distance between the nearest sample point and the plane (Al Shuraiaan et al., 2024). These sample points closest to the hyperplane are called *support vectors*, hence the name SVM. By introducing kernel functions, the SVM can transform linearly inseparable problems into linearly separable problems and classify them in higher dimensional feature spaces. The SVM algorithm has the following advantages.

1. Capable of handling high-dimensional data: The SVM classifies in a high-dimensional feature space and is suitable for processing data with many features. This makes it widely used in fields such as text classification and image recognition.

2. Effectively handling nonlinear problems: By introducing kernel functions, the SVM can transform nonlinear classification problems into linearly separable or approximately separable problems. This enables the SVM to handle complex data structures and has strong generalization ability.
3. Strong robustness: the SVM determines decision boundaries by maximizing classification intervals, making it more robust to noise and outliers. This makes SVMs perform well in handling noisy data.
4. Control overfitting: SVM can effectively control the complexity of the model and avoid overfitting problems by adjusting the selection of regularization parameters and kernel functions.

The basic steps of the SVM algorithm include data collection and preparation, feature selection and transformation, definition of objective function, optimization solution, prediction, and classification, as well as model evaluation and optimization (Blake et al., 2024). By understanding and implementing these steps, we can build a powerful and accurate classifier to provide solutions for various practical problems. The basic steps of the SVM algorithm are as follows.

1. Collect and prepare data: Obtain data samples that need to be classified and preprocessed, including data cleaning, feature extraction, and standardization operations.
2. Feature selection and transformation: Based on specific problems, select appropriate features and perform feature transformation to map data to high-dimensional space.
3. Define objective function: The goal of SVM is to find an optimal hyperplane that maximizes the interval between the nearest sample point and the plane. Usually, soft or hard intervals are used to define the objective function.
4. Optimization solution: Using optimization algorithms (such as sequence minimum optimization algorithm) to solve the objective function and determine the optimal hyperplane and support vector.
5. Prediction and classification: Use trained models to predict and classify new samples. Calculate the new sample’s distance from the hyperplane to determine its category.
6. Model evaluation and optimization: Use test datasets to evaluate the model, adjust the selection of hyperparameters and kernel functions and improve the performance and generalization ability of the model.

The SVM algorithm, as a powerful classifier, has shown excellent performance in multiple fields. SVMs can handle various complex tasks, whether text classification, image recognition, financial risk analysis, or medical diagnosis (Hu et al., 2024). We can fully leverage the advantages of the SVM algorithm to provide accurate and reliable solutions for practical problems. The SVM algorithm has a wide range of applications in machine learning and data mining, including but not limited to the following areas.

1. Text classification: SVMs can classify text, such as spam filtering, sentiment analysis, news classification, etc.
2. Image recognition: SVMs can be used for image classification and object recognition, such as facial recognition, handwritten digit recognition, and object detection.
3. Bioinformatics: SVMs can be applied in fields such as gene expression data analysis, protein classification, and DNA sequence classification.
4. Financial field: SVMs can be used for financial risk analysis and decision support tasks such as credit scoring, fraud detection, and stock market prediction.
5. Medical diagnosis: SVMs can be used for medical image classification, disease prediction, and diagnostic assistance, such as breast cancer diagnosis and diabetes prediction.

6. Natural language processing: SVMs can be used for natural language processing tasks such as named entity recognition, entity relationship extraction, and syntax analysis.
7. Network security: SVMs can be used in network security fields such as intrusion detection, network traffic classification, and abnormal behavior recognition.

In summary, the SVM has a wide range of application fields and is suitable for various classification and regression problems. Its powerful feature processing and generalization capabilities make SVM an indispensable tool in machine learning.

A Multimedia Teaching Effectiveness Evaluation Model Based on SVM

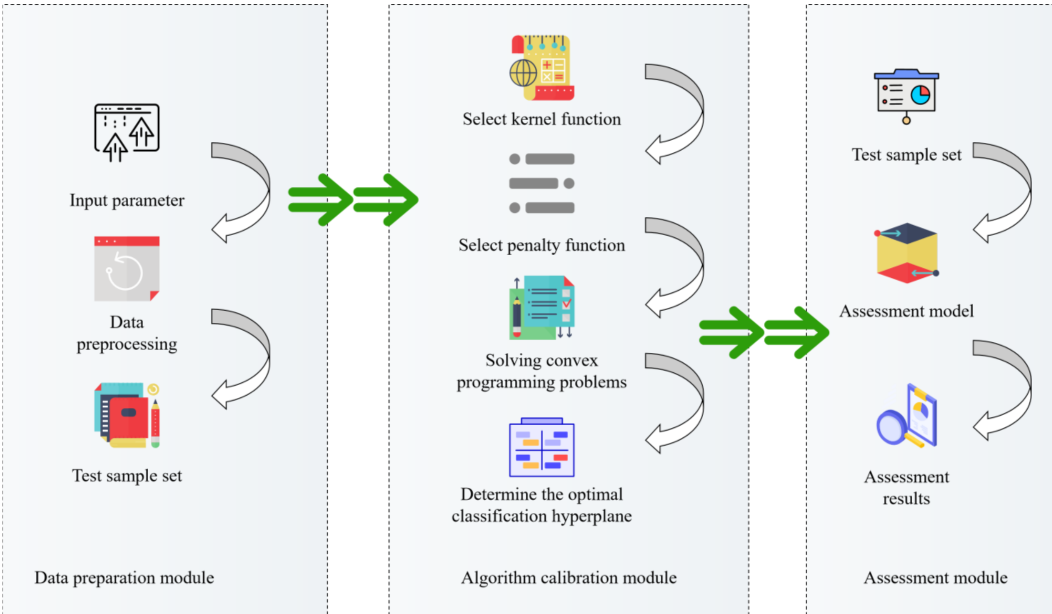
At present, multimedia teaching generally only takes the place of traditional teaching methods instead of the revolution of educational technology and the upgrading of teaching methods, which cannot highlight the advantages of multimedia teaching, and the instructional effect is not ideal. The fundamental reason for this phenomenon is the lack of a scientific and reasonable multimedia instructional assessment system, which cannot objectively measure, measure, and judge the value of multimedia teaching. Starting from the characteristics of multimedia teaching itself, it is necessary to construct an assessment index system of multimedia teaching that can give full play to its advantages, assessing and analyzing all aspects of multimedia teaching to fully tap the advantages of multimedia teaching and give full play to the role of multimedia technology in improving instructional effect and efficiency. It is necessary to assess multimedia instructional effects and efficiency objectively, correctly, and scientifically.

Warm-up study before face-to-face teaching can ensure that students actively exercise their language skills and critical thinking in conversation. In addition, the formative feedback provided by multimedia instructional mode can help teachers clarify their understanding and misunderstanding, thus ensuring that students can organize their newly learned knowledge in a way that is easier to use later. Student-led discussion can urge students to use online materials before class. The misunderstanding can be clarified in the early stage of the instructional stage, and the teacher can easily identify the areas that need renovation, whether it is necessary to repeat a certain point in grammar or emphasize a certain language skill.

In the evaluation model of multimedia teaching effectiveness in foreign language translation, modifications to the traditional SVM involve the following aspects.

1. Feature selection: Traditional SVM algorithms typically use manually selected features as inputs, but in multimedia teaching, more audio-visual features such as audio spectrum and video frame differences can be considered to extract more effective feature representations. Therefore, feature selection optimization can be done in the model to obtain a feature set that better reflects the learning effect.
2. Kernel function selection: The SVM algorithm maps samples to high-dimensional space for classification through kernel functions. For the evaluation of multimedia teaching, more adaptable kernel functions, such as nonlinear kernel functions, can be selected to handle complex nonlinear relationships better.
3. Sample imbalance problem: In multimedia teaching evaluation, there may be differences in the participation and learning outcomes of different learners, leading to the problem of sample imbalance. To address this issue, some methods can be used, such as oversampling or undersampling techniques, to balance the proportion of positive and negative samples and improve the model’s performance.
4. Objective function design: Traditional SVM algorithms usually use the objective function with maximum interval, but in multimedia teaching evaluation, a more suitable objective function can be designed based on the characteristics and objectives of specific tasks. For example, punishment

Figure 1. SVM Regression Prediction Assessment Process



or reward terms for learner behavior can be introduced to measure learning effectiveness more accurately.

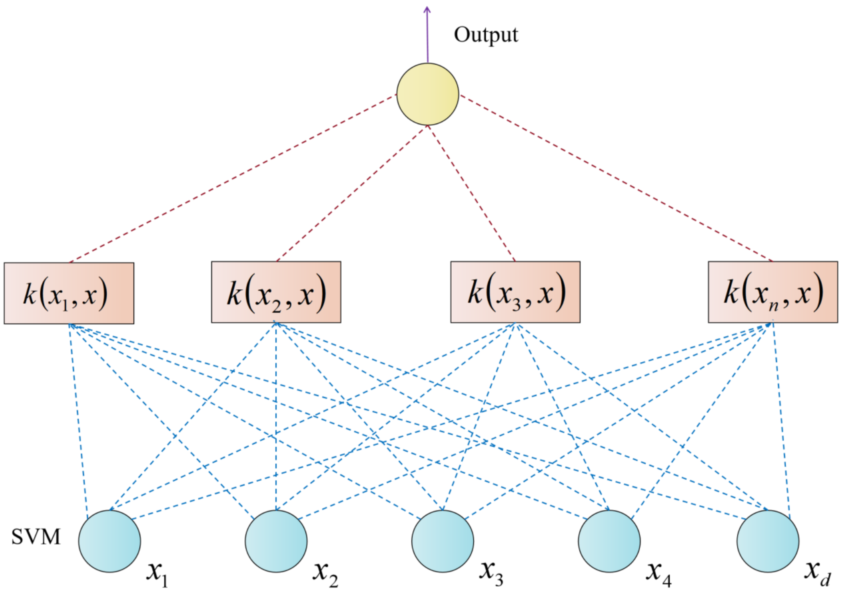
Figure 1 shows the stages of SVM regression prediction and assessment in foreign language translation teaching.

The final standard of instructional assessment is whether the instructional effect can be guaranteed and improved. The development and use of teaching software are all aimed at enhancing the instructional effect. Otherwise, there is no need to adopt multimedia. Multimedia and networks are all means, so they should not restrict the instructional stage, and the interest and sensory stimulation should not be paid too much attention, which lacks practicality and guidance. It is necessary to give full play to the learner's potential, strengthen the instructional effect, and improve it through multimedia teaching. In generating a binary classification tree, we should follow a progression in difficulty, divide the most easily separated classes first and then the more difficult ones so that the classification errors are as far away from the root node as possible. In addition, the structure of the binary classification tree should be balanced as far as possible; that is, it should be as close to the normal tree as possible.

In the design process, the nonlinear relationship between the assessment index and the assessment target is taken into account. The analysis of the previous instructional effect assessment system is combined with experience and trial to fully understand the problems to be solved. A better design scheme is selected through an improved experiment. Figure 2 shows the nonlinear SVM model.

The fundamental purpose of instructional effect assessment is to improve and control the education system constantly. Therefore, the function of instructional effect assessment can detect and control all links in the education system, thus effectively improving the teaching quality. When evaluating, we can choose different emphases according to the actual needs and focus on one aspect of instructional assessment. Usually, human thinking is very accidental and uncertain, so the information involved in dealing with problems cannot usually be covered by a database. That is to say, the system's handling of problems is inaccurate. As the most powerful way for human beings to interact with the outside world, language can help people convey information clearly and effectively in daily activities. However, it

Figure 2. Nonlinear SVM Model



cannot be denied that natural language is usually imprecise and quantitative. If computers are needed to accept such expressions, the information conveyed by such expressions must be quantified.

On the surface, the one-time direct solution method is simpler and more feasible, but in fact, the objective function of this method is extremely complex, resulting in too high computational complexity and too long training time, so this method is not adopted in practical application. In the known P learning samples, first, the first training sample is the input value of the input layer unit:

$$x = x_1, x_2, x_3, \cdots, x_{12} \tag{1}$$

The implicit layer output is defined as:

$$O_j = f\left(\sum_{i=1}^{n+1} v_{ij} x_i\right) x_n = 1, v_{i,n+1} = -\theta_j \tag{2}$$

The output layer produces:

$$y = f\left(\sum_{j=1}^{n++1} \omega_{jk} x_j\right) x_{n+1} = 1, \omega_{j,n+1} = -\theta_k \tag{3}$$

The output layer error is calculated as:

$$d_{jk} = y(1-y)(y-Y) \tag{4}$$

and the implicit layer error is calculated as:

$$d_{ij} = O_j(1-O_j)\sum_{k=1}^{m} d_{ij}\omega_{jk} \tag{5}$$

The SVM is used to modify the weights and thresholds of each layer to accelerate the convergence speed of network learning:

$$\omega_{jk} = (n_0+1) = \omega_{jk}(n_0)+\eta \cdot d_{jk}x_j + \alpha\Delta\omega_{jk}(n_0) \tag{6}$$

$$\omega_{ij} = (n_0+1) = \omega_{ij}(n_0) + \eta \cdot d_{ij}x_i + \alpha\Delta\omega_{ij}(n_0) \tag{7}$$

In calculating the global error value, when the global error is lower than the preset precision value or the number of network training iterations is greater than the maximum number, then this round of iterative learning is complete.

Each individual in a population is represented by a class, and each individual in the same population has different hidden layers, link weights, and nodes. Any individual in a large population comes from a small population, and all individuals in a small population have the same network structure and different link weights. When individuals in different small populations evolve in groups, those with higher adaptability in small populations will have a greater chance to jump into large populations for crossover and mutation operations and then return to the original small populations to complete the next round of internal evolution of small populations. The samples in multimedia instructional effect assessment may have the same problem, so it is not appropriate to directly apply which SVM multi-classifier, but the weighted classification method should be introduced to reduce the classification deviation caused by the imbalance of the number of positive and negative classes of samples.

The SVM classification weighting method is adopted to correct the classification deviation caused by the imbalance of samples:

$$\min \varphi(x) = \frac{1}{2} \| \omega \|^2 + C\lambda_i \sum_{i=1}^{l} S_i\xi_i \tag{8}$$

$$s \cdot t \cdot y_i(\omega_{xi} + b) > 1 - \xi_i, \xi_i \geq 0 \tag{9}$$

where $\lambda_i(\lambda \geq 1)$ is the weight of class i, when $\lambda_i > 1$ indicates that the number of samples of i class is small; $s_i(s_i > 0)$ is the weight of sample x, when $s_i > 1$ indicates that x_i is important, $s_i = 1$ indicates that x_i is generally important, and $s_i < 1$ indicates that Sample x is not important.

The classification accuracy is affected by setting the class weight λ_i and the sample weight s_i. Thereby avoiding the occurrence of classification errors and improving the reliability of classification. The Lagrange function of the above optimization problem is:

$$L(w,b,\xi,\alpha,\beta) = \frac{1}{2} \| w \|^2 + C\sum_i \xi_i + D\sum_I v_i \cdot G_i - \sum_i \alpha_i(y_i(w \cdot x_i + b) - 1 + \xi_i) - \sum \beta_i\xi_i \tag{10}$$

Let $\alpha^{*} = (\alpha_1^{*}, \cdots, \alpha_l^{*})^T$ be any solution to the appeal problem, select a positive component of a^{*}, and obtain the normal vector w^{*} of the optimal classification hyperplane and the classification threshold b^{*}:

$$W^{*} = \sum_i a_i^{*} y_i x_i - D \sum_i T_i \cdot G_i$$
$$b^{*} = y_i - \sum_i y_i a_i^{*} (x_i \cdot x_j) + D \sum_i x_j \cdot (T_i \cdot G_i) \tag{11}$$

Therefore, for any given unknown class sample x, its discriminant function is:

$$f(x) = \sum_i a_i^{*} y_i (x_i \cdot x) + b^{*} \tag{12}$$

Data, information, and knowledge are completely different concepts. The simplest is data, followed by information, and knowledge is the most complex. The transmission of information should take data as the carrier. When the human brain analyzes information, tacit knowledge will be formed. This knowledge will further form explicit knowledge by clearly reproducing and communicating with others through text, written words, and oral or other expressions output by computer. It is important to know how and why to guide students to complete tasks successfully and to detect and correct modeling errors. Translation teaching needs to apply language skills in an appropriate learning environment, so that students can show their language ability.

The SVM algorithm in this article is of great significance for evaluating the effectiveness of multimedia teaching in foreign language translation. The specific manifestations are as follows.

1. Improving assessment accuracy: Multimedia teaching involves many complex factors, such as video, audio, and text, and not all of these factors can intuitively reflect learning outcomes. By adopting more optimized SVM algorithms, complex nonlinear relationships can be better handled, and more effective feature representations can be extracted, thereby improving the accuracy of evaluation.
2. Optimizing feature selection: Traditional SVM algorithms typically require manual feature selection, which may overlook some important features. The improved SVM algorithm can automatically select features related to the evaluation target, more comprehensively reflecting the learning situation of learners, thereby improving evaluation performance.
3. Dealing with imbalanced samples: When evaluating multimedia teaching, there may be differences in the participation and learning outcomes of different learners, leading to imbalanced samples. Traditional SVM algorithms may be affected by this issue, while improved SVM algorithms use oversampling or undersampling techniques to balance the proportion of positive and negative samples, thereby improving evaluation performance.
4. More adaptable: By designing more suitable objective functions, the improved SVM algorithm can more accurately measure learning effectiveness, thereby improving the reliability and practicality of evaluation. Meanwhile, the improved SVM algorithm also has a certain degree of adaptive ability, which can adjust parameters according to specific situations to achieve better performance.

In summary, the improved SVM algorithm has important practical significance for evaluating the effectiveness of multimedia teaching in foreign language translation. It can improve evaluation accuracy, optimize feature selection, handle sample imbalance problems, and be more adaptable, thus better serving the needs of foreign language translation teaching.

RESULT AND ANALYSIS

Analysis of Experimental Results

The teaching process is a stage of information transmission and feedback, and instructional effect assessment is an important link of information feedback in the instructional stage. Through assessing the instructional effect, a smooth information feedback network can be established in the instructional stage, which can promote the instructional stage to achieve self-regulation and a win–win cycle, to improve the instructional effect continuously. In the assessment of classroom instructional effect, teaching work is appraised or graded so that the teaching management department can better understand the instructional effect and level of teachers, which can be used as one of the important bases for teacher promotions, assessment, and can prevent the phenomenon that teachers do well and do poorly from being treated unreasonably. In the face-to-face teaching session, you can share the assessment criteria with students and explain the descriptive words to them, to reach a consensus on the assessment criteria. Figure 3 shows data outlier removal processing.

Using these data to train the designed instructional effect assessment model can get better network weight. A large number of interconnected network structures in the instructional effect assessment model can process large-scale data in parallel, realize global real-time information analysis, and quickly coordinate the relationship of various input information for a specific problem.

The annotation form used for non-numerical treatment of uncertainty is a kind of semantic description. Considering that there are many aspects and possibilities for the causes of uncertainty, it is not enough to only use numerical description, which still cannot completely solve the semantic ambiguity. At present, expert systems mostly use numerical methods to deal with uncertain problems. In essence, based on the theory of fuzzy mathematics, they construct corresponding algebraic models

Figure 3. Data Outlier Removal Processing

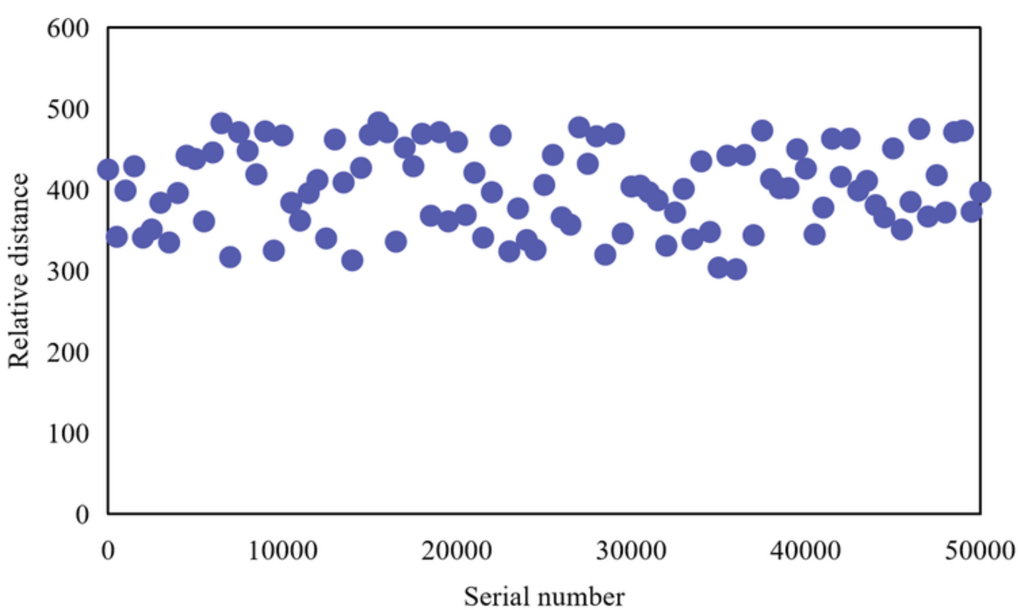


Table 1. Assessment Results of Experts and Neural Network

Sample number	Expert appraisal	Improved SVM assessment
1	0.95	0.952
2	0.88	0.876
3	0.89	0.891
4	0.74	0.745
5	0.78	0.789
6	0.69	0.683
7	0.76	0.765
8	0.68	0.678
9	0.69	0.688
10	0.78	0.785
11	0.83	0.835
12	0.74	0.747
13	0.78	0.779
14	0.72	0.734
15	0.69	0.692

to deal with and analyze uncertain factors. In the stage of reasoning, we should not only make clear the degree of trust, but also make clear the reasons for the value of trust. The annotation method is a non-numerical processing method based on the trust system, which can clearly describe the causes of uncertainty, thus helping to find effective measures to deal with such uncertainty. In order to verify the assessment effect of the improved SVM model, 15 groups of test data prepared in advance are input into the trained assessment model. Table 1 and Figure 4 show the simulation results and expert assessment results. It can be found that all training samples are close to expert assessment results.

The results show that, compared with the non-optimized assessment model, the improved SVM has the advantages of fast convergence speed, small prediction error, and higher recognition ability. Description knowledge has advantages such as clear semantics, good readability, and easy understanding, and the knowledge is relatively independent of each other. So, it has good modularity, which also brings great help to the expansion and maintenance of subsequent knowledge. The only disadvantage of this system is that when the storage of descriptive knowledge is large, the processing efficiency will be low. This is because the system needs to repeatedly compare the descriptive knowledge used in the knowledge base to find the most applicable knowledge.

Figures 5 and 6 show the results of comparing the accuracy and average absolute error of the multimedia instructional effect assessment model with the traditional SVM. After many iterations, the accuracy of this method reaches 96.84%, which is 22.18% higher than the traditional SVM, and the error is reduced by 30.69%.

The function of the knowledge base system is to meet the actual needs of users according to the contents stored in the system. The specific process is first to understand user needs through the user interface, analyze, and establish a task list, then call relevant knowledge from the knowledge base to solve and verify problems, and finally give feedback to users. Assessment index system refers to a group of closely related index systems that can reflect all sides of the assessment object according to the assessment purpose and certain objects. It is the decomposition of the assessment objective and the embodiment of the concretization or behaviorism of the assessment objective. In

Figure 4. Assessment Results of Experts and Neural Network

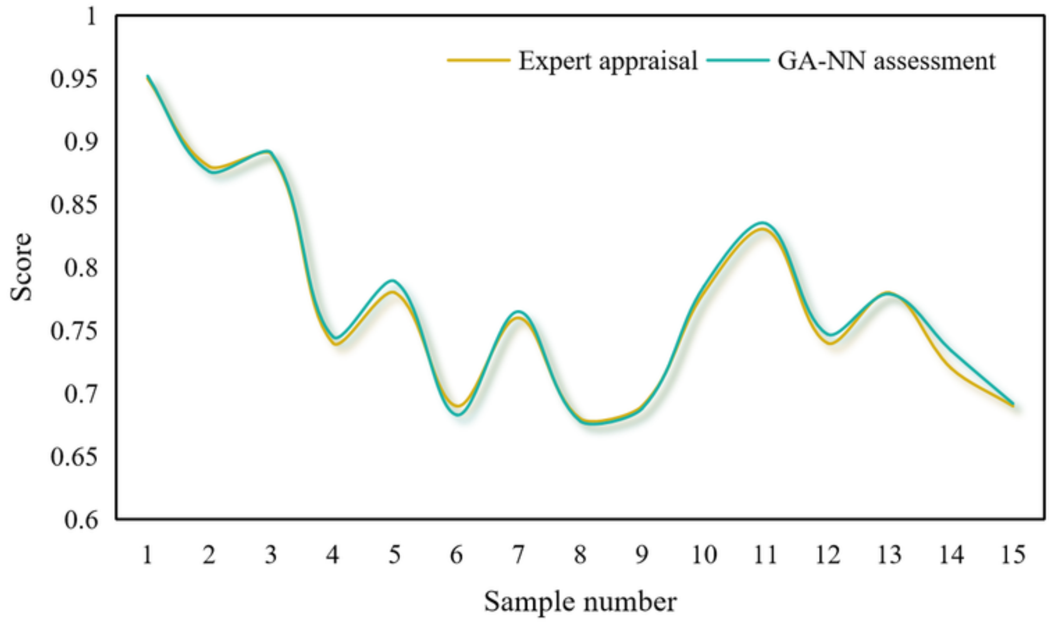


Figure 5. Accuracy Comparison

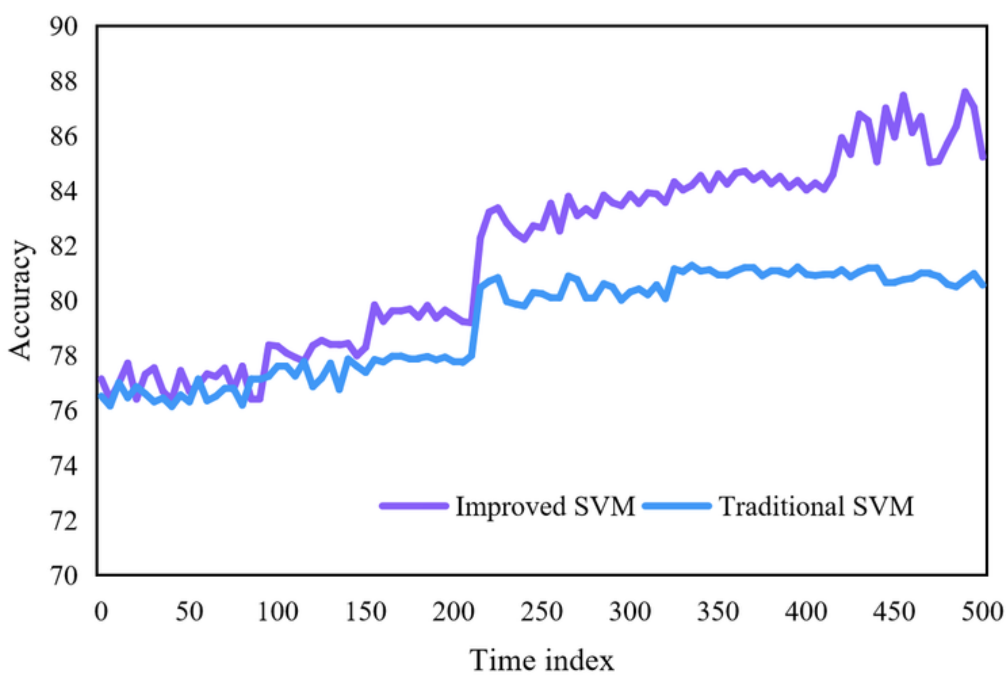
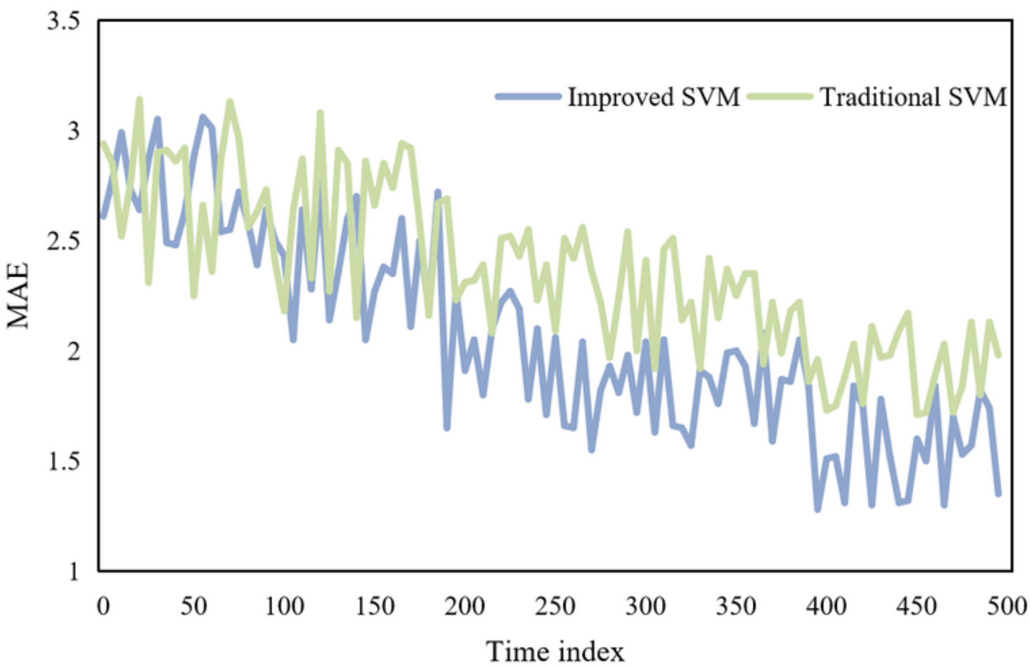


Figure 6. Comparison of MAE



the knowledge-based system, the knowledge base is a relatively independent program entity used to store the knowledge needed for problem-solving, and the knowledge is explicitly expressed in the form of description, so the knowledge base has a certain intelligence. Compared with the common database system, the knowledge base system has certain intelligence. When dealing with practical problems raised by users, the knowledge base system uses its own stored knowledge to analyze, to judge, and to get the final result, instead of completely relying on the information provided by users.

According to the format, the training samples are input into two instructional effect assessment models for learning, and then the test samples are input into two assessment models for testing. Figure 7 shows the test results of the traditional SVM instructional effect assessment model, and Figure 8 shows the test results of the improved SVM instructional effect assessment model. The ratio between the actual value and the predicted value of the improved SVM instructional assessment method is closer to the straight line. That is, the actual value and the predicted value of the improved SVM instructional effect assessment model are closer.

In traditional methods, there are many forms of database organization, but these different forms of organization have their own advantages and disadvantages. For example, the query efficiency of tree structure knowledge is high, but the compilation efficiency is low. Through this system, evaluators can assess all teachers online and adjust teaching through comprehensive assessment results. The assessment effect is often directly affected by the weight distribution of each index. If the weight distribution is appropriate, the reference to the assessment results is very meaningful. A comparison of the accuracy of the two models in evaluating the data processing of the test set is shown in Table 2.

It can be analyzed that the multimedia instructional effect assessment model of foreign language translation based on improved SVM is better than that of traditional SVM in terms of time measurement accuracy and efficiency. Compared with the traditional assessment algorithm, the accuracy of this assessment algorithm is improved by 22.18%. Therefore, it is theoretically feasible to use improved

Figure 7. Scatter Diagram of Actual Value and Predicted Value of Traditional SVM

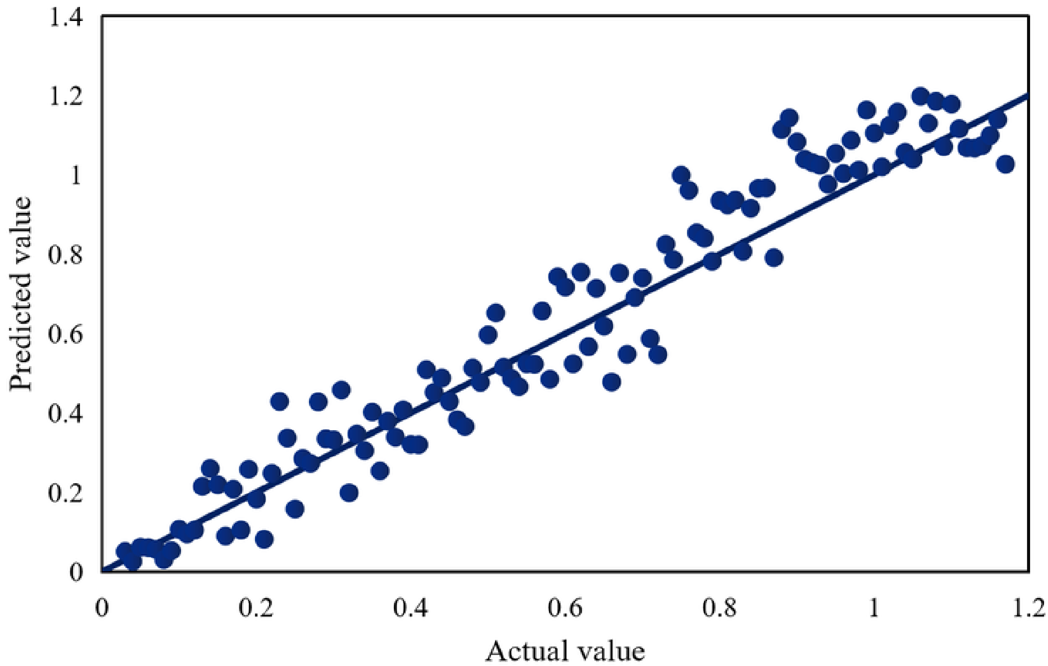


Figure 8. Scatter Chart of Actual Value and Predicted Value of Improved SVM

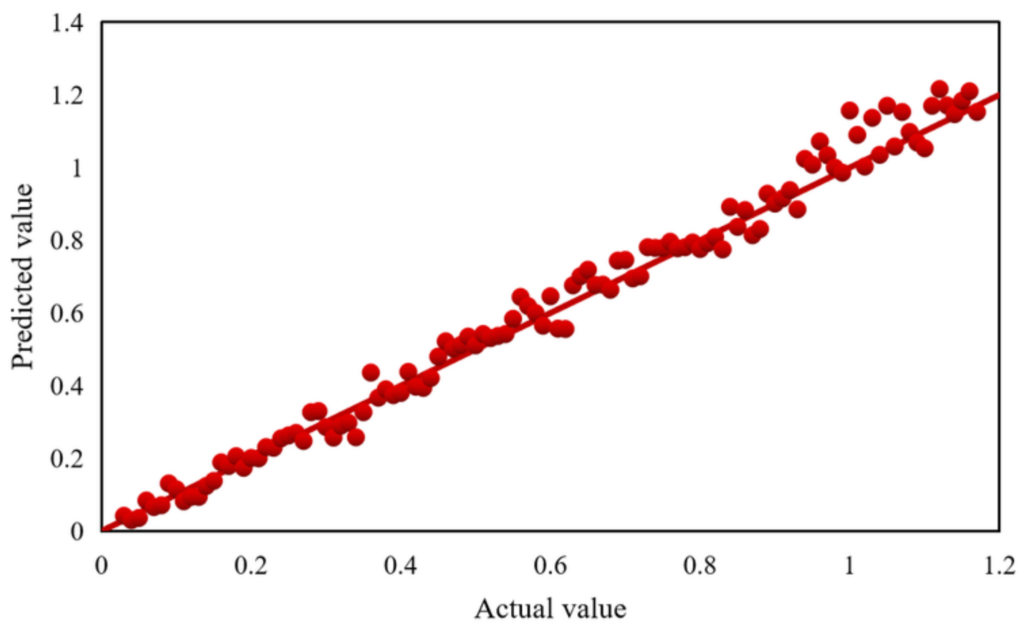


Table 2. Comparison of Assessment Performance of Two Models

Use model	Test accuracy (%)	Training time (s)
Improved SVM	96.84	3
Traditional SVM	74.66	5

SVM to analyze the application effect of multimedia instructional models in foreign language translation teaching.

In order to make the operation of assessment data consistent, the system operates each assessment function module in a centralized time. It is forbidden to operate in advance or lag, and the running and opening time of each assessment function module should be set in sequence. Grades and classes participating in the assessment can be adjusted, and disciplines participating in the assessment can also be adjusted. After training, the assessment data can not only provide assessment and analysis of the overall situation of teaching courses but also analyze and assess individual indicators, which greatly reduces the human interference factors, so it greatly enhances the practicability and reliability of the system. The analysis of all kinds of data supported by it realizes a more objective, fair, scientific, and accurate tracking of instructional effects for university leaders and teaching supervision departments. It provides a reliable basis for the next instructional reform of the school.

Analysis of Practical Applications

Foreign language translation teaching has always been an important topic of concern in the field of education. In this era of globalization, mastering foreign language translation skills has become the key to cross-cultural communication and international cooperation. However, current research on foreign language translation teaching has some limitations in evaluating teaching effectiveness. When exploring the future development direction of foreign language translation teaching, we must be aware of some of the limitations faced by the research. These limitations require us to conduct in-depth thinking and research in order to gain a more comprehensive understanding of the essence of foreign language translation teaching and find better solutions. Future research should be based on overcoming these limitations to promote innovation and progress in the field of foreign language translation teaching. The limitations of this study are as follows:

1. Limited sample size: The research results of this article are based on a limited sample size. Due to limitations in experimental conditions, the sample size may not be sufficient to represent the comprehensive situation of foreign language translation teaching fully. Therefore, it is necessary to further expand the sample size by expanding the survey scope, increasing the number of participants, or engaging in cross-institutional cooperation to obtain more sample data, in order to improve the reliability and universality of the study.
2. Limitations of the research method: This article adopts an improved SVM algorithm as the evaluation model, but this does not mean the method is optimal. In future research, other machine learning algorithms or deep learning methods can be explored to compare the performance of different methods in evaluating the effectiveness of foreign language translation teaching.
3. Differences in teaching environment: The implementation environment of foreign language translation teaching may vary, including different textbooks, teaching methods, and teacher qualities. The research findings of this article are based on specific teaching environments, and other environmental factors may influence their applicability. Therefore, in future research, it is possible to consider selecting multiple different types of schools, teachers, and students for empirical research to gain a more comprehensive understanding of the impact of the teaching environment on foreign language translation teaching. At the same time, factors that affect the

evaluation of teaching effectiveness can be identified by comparing different textbooks, teaching methods, and teacher qualities.

4. The subjectivity of teaching effectiveness evaluation: This study is based on a combination of subjective evaluation and objective measurement methods. However, subjective evaluation is often influenced by individual differences and subjective preferences of evaluators and may have a certain degree of subjectivity. Future research can further explore objective evaluation indicators, reduce subjective evaluation bias by measuring objective indicators, and improve the objectivity and accuracy of evaluation.

The practical application of this article is mainly reflected in the field of foreign language translation teaching, as follows:

1. Teaching plan development: The research results of this article can provide reference and guidance for teachers and educational institutions in foreign language translation teaching. Based on the evaluation of teaching effectiveness in different methods and environments in research, teachers can choose appropriate teaching methods and strategies targeted at students and develop teaching plans that meet their needs.
2. Teaching strategy optimization: The research results of this article can reveal the problems and challenges in foreign language translation teaching, providing teachers with motivation and direction for improvement. Teachers can combine research findings to optimize teaching strategies, improve teaching effectiveness, and enhance student learning outcomes.
3. Improvement of teaching evaluation: The research results of this article can promote the improvement of evaluation methods for foreign language translation teaching. By overcoming the limitations of research and exploring new evaluation indicators and methods, the objectivity and accuracy of evaluation can be improved, and the translation ability and language proficiency of students can be more comprehensively measured.
4. Teaching innovation and improvement: This study provides a theoretical and practical basis for innovation and improvement in the field of foreign language translation teaching. Based on research results, teachers and educational institutions can explore new teaching methods and environments to improve teaching quality and student learning experience.

In summary, this article's practical application mainly focuses on formulating foreign language translation teaching plans, optimizing teaching strategies, improving teaching evaluation, and innovating and improving teaching. By applying the research findings of this article, the effectiveness and quality of foreign language translation teaching can be improved, and talents with cross-cultural communication skills and international competitiveness can be cultivated.

CONCLUSION

With the continuous development of globalization, foreign language teaching has become an indispensable part of the education field. The application of multimedia technology has brought new opportunities and challenges to foreign language translation teaching. This article proposes a foreign language translation multimedia teaching effectiveness evaluation model based on an improved SVM algorithm. The model combines artificial intelligence technology with multimedia teaching, providing an effective solution for evaluating the effectiveness of foreign language translation teaching. By conducting a comprehensive evaluation of foreign language translation teaching, we can more accurately understand student mastery of language translation and make targeted improvements to the teaching process. The research results indicate that the improved SVM based evaluation model outperforms traditional SVM in terms of time measurement accuracy and efficiency. Compared with traditional evaluation algorithms, the accuracy of this evaluation algorithm has increased by 22.18%. By combining multimedia technology, the interactivity in the teaching process has been greatly improved, allowing students to participate actively in teaching and improving teaching effectiveness and learning motivation. The research results of this article have important reference value for improving foreign language translation teaching and optimizing teaching methods. Educators can adjust teaching content and strategies in a targeted manner based on the accurate data provided by the evaluation model, in order to improve foreign language translation skills. At the same time, this model also provides a scientific and objective method for school administrators to evaluate teaching quality and provides guidance for formulating teaching reform plans. Future research can introduce deep learning techniques into foreign language translation teaching to improve teaching effectiveness and learning quality.

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DATA AVAILABILITY

This paper includes research data to support the results of this study.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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REFERENCES

Al Shuraiaan, A., Al Bloushi, B., & Al Bloushi, L. (2024). The double-edged sword: Analyzing the influence of technology on English language learning in Kuwait higher education institutions (HEIs). *International Journal of Middle Eastern Research*, *3*(1), 15–23. doi:10.32996/ijmer.2024.3.1.3

Alkateeb, H. A. (2023). The British Council's role in nourishing the English language teaching industry in the Gulf Cooperation Council region: A visual social semiotic perspective. *Social Semiotics*, *33*(2), 305–325. doi:10.1080/10350330.2020.1833686

Blake, J., Bogach, N., Kusakari, A., Lezhenin, I., Khaustova, V., Xuan, S. L., Nguyen, V., Pham, N. B., Svechnikov, R., Ostapchuk, A., Efimov, D., & Pyshkin, E. (2024). An Open CAPT system for prosody practice: Practical steps towards multilingual setup. *Languages (Basel, Switzerland)*, *9*(1), 27. doi:10.3390/languages9010027

Bond, M., Khosravi, H., De Laat, M., Bergdahl, N., Negrea, V., Oxley, E., Pham, P., Chong, S. W., & Siemens, G. (2024). A meta systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigour. *International Journal of Educational Technology in Higher Education*, *21*(1), 4. doi:10.1186/s41239-023-00436-z

Buzdar, H. Q. (2024). Identifying the grammatical errors in ESL students at graduate level: A Comparative analysis of multimedia and traditional modes of pedagogy. *Pakistan Journal of Social Sciences*, *44*(1), 1–8.

Chang, C. Y., Yang, C. L., Jen, H. J., Ogata, H., & Hwang, G. H. (2024). Facilitating nursing and health education by incorporating ChatGPT into learning designs. *Journal of Educational Technology & Society*, *27*(1), 215–230.

Chen, B., Bao, L., Zhang, R., Zhang, J., Liu, F., Wang, S., & Li, M. (2024). A multi-strategy computer-assisted EFL writing learning system with deep learning incorporated and its effects on learning: A writing feedback perspective. *Journal of Educational Computing Research*, *61*(8), 60–102. doi:10.1177/07356331231189294

Cui, W. (2024). Cognitive linguistic corpus classification and terminology database design based on multimedia technology. *Journal of Electrical Systems*, *20*(1), 91–105. doi:10.52783/jes.668

Dai, Y., Lin, Z., Liu, A., Dai, D., & Wang, W. (2024). Effect of an analogy-based approach of artificial intelligence pedagogy in upper primary schools. *Journal of Educational Computing Research*, *61*(8), 159–186. doi:10.1177/07356331231201342

Gren, L. (2020). A flipped classroom approach to teaching empirical software engineering. *IEEE Transactions on Education*, *63*(3), 155–163. doi:10.1109/TE.2019.2960264

Hu, Y., Fang, C., Wu, J., Mi, L., & Dai, P. (2024). Investigating the interrelationship among academic emotions, classroom engagement, and self-efficacy in the context of EFL learning in smart classrooms in China. *Australian Journal of Psychology*, *76*(1), 2300460. doi:10.1080/00049530.2023.2300460

Jiménez, W. C. (2024). El Assessing artificial intelligence and professors' calibration in English as a foreign language writing courses at a Costa Rican public university. *Actualidades Investigativas en Educación*, *24*(1), 1–25. doi:10.15517/aie.v24i1.55612

Khrapatyi, S., Tokarieva, K., Hlushchenko, O., Paramonova, O., & Lvova, I. (2024). Research on performance evaluation of higher vocational education informatization based on data envelopment analysis. *STEM Education*, *4*(1), 51–70. doi:10.3934/steme.2024004

Koka, N. A. (2024). The integration and utilization of artificial intelligence (AI) in supporting older/senior lecturers to adapt to the changing landscape in translation pedagogy. *Migration Letters : An International Journal of Migration Studies*, *21*(S1), 59–71. doi:10.59670/ml.v21iS1.5939

Lin, L. (2021). Smart teaching evaluation model using weighted naïve Bayes algorithm. *Journal of Intelligent & Fuzzy Systems*, *40*(2), 2791–2801. doi:10.3233/JIFS-189320

Liu, L. (2021). Research on IT English flipped classroom teaching model based on SPOC. *Scientific Programming*, *2021*, 1–9. doi:10.1155/2021/9485654

Novawan, A., Walker, S. A., & Ikeda, O. (2024). The new face of technology-enhanced language learning (TELL) with artificial intelligence (AI): Teacher perspectives, practices, and challenges. *Journal of English in Academic and Professional Communication*, *10*(1), 1–18. doi:10.25047/jeapco.v9i1.3754

Rahiman, H. U., & Kodikal, R. (2024). Revolutionizing education: Artificial intelligence empowered learning in higher education. *Cogent Education*, *11*(1), 2293431. doi:10.1080/2331186X.2023.2293431

Sun, C., Wei, L., & Young, R. F. (2022). Measuring teacher cognition: Comparing Chinese EFL teachers' implicit and explicit attitudes toward English language teaching methods. *Language Teaching Research*, *26*(3), 382–410. doi:10.1177/1362168820903010

Ting, X. (2021). Chemistry course network teaching based on key information search and big data cloud platform. *Journal of Intelligent & Fuzzy Systems*, *40*(4), 7347–7358. doi:10.3233/JIFS-189559

Weidener, L., & Fischer, M. (2024). Artificial intelligence in medicine: Cross-sectional study among medical students on application, education, and ethical aspects. *JMIR Medical Education*, *10*(1), e51247. doi:10.2196/51247 PMID:38180787

Zhang, Y., Feng, H., Zhao, Y., & Zhang, S. (2024). Exploring the application of the artificial-intelligence-integrated platform 3D Slicer in medical imaging education. *Diagnostics (Basel)*, *14*(2), 146. doi:10.3390/diagnostics14020146 PMID:38248022

Zhen, C. (2021). Using big data fuzzy *k*-means clustering and information fusion algorithm in English teaching ability evaluation. *Complexity*, *2021*, 1–9. doi:10.1155/2021/5554444