Retraction

Retracted: An Analysis of English Classroom Multimedia Teaching Quality Based on Elite Teaching Optimization Algorithm

Advances in Multimedia

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] C. Zhao and D. Jiang, "An Analysis of English Classroom Multimedia Teaching Quality Based on Elite Teaching Optimization Algorithm," *Advances in Multimedia*, vol. 2021, Article ID 4693122, 7 pages, 2021.

Research Article

An Analysis of English Classroom Multimedia Teaching Quality Based on Elite Teaching Optimization Algorithm

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As China is increasingly developing towards internationalization, English has become one of the essential skills for foreign communication. In view of the evaluation of music teaching quality, this paper tries to introduce elite teaching optimization algorithm, use multimedia to assist, sort out the factors affecting English teaching quality to build the corresponding indexes, select and optimize the English teaching quality evaluation model, and finally judge the results of English teaching quality. The simulation results show that the elite teaching optimization algorithm is effective and can support the quality analysis of English classroom multimedia teaching.

1. Introduction

With the continuous development of social economy, the openness of external communication is becoming greater and greater. Therefore, English learning has become one of the necessary skills for communication [1]. Compared with traditional English teaching, the existing English teaching management continuously introduces data mining analysis technology for multiscale and multidimensional analysis, flexibility, and science of English teaching [2, 3]. However, since many factors need to be considered in English teaching quality, it is difficult and ineffective to evaluate English teaching quality with a single factor, so an appropriate algorithm is selected for English teaching evaluation [4, 5]. As for English, it has become a compulsory course in compulsory education and college education, so it is very important to improve the quality of English teaching [6].

The evaluation of English teaching effect can be measured by teaching quality. Therefore, it is extremely important to establish an effective and accurate evaluation index of English teaching quality [7]. Different from other teaching methods, English teaching has some distinct characteristics, such as strong interaction, which requires situational dialogue with others to practice oral English and expression. Therefore, teaching evaluation is relatively complex [8–10]. Traditional teaching mostly uses fixed evaluation methods for evaluation, such as the expert scoring method, inviting a number of relevant experts to evaluate English teaching and, at the same time, investigating the evaluation of students for comprehensive evaluation of English teaching or the use of fixed evaluation indicators, comprehensive evaluation. However, these evaluation methods often have some bottlenecks, such as too strong subjectivity and not enough objective. The rationality of the indexes needs to be verified. At the same time, whether there is mutual interference or violation among the indexes, the overly complex indexes will also lead to the decline of calculation efficiency, and an efficient teaching evaluation cannot be achieved [11, 12].

In order to effectively and accurately evaluate quality of English teaching, aiming at the limitations of the existing evaluation, this paper tries to merge the elite teaching optimization algorithm, optimization, and analysis and aims to explore the English teaching method.

2. Elite Teaching Optimization Algorithm

2.1. Basic Teaching Optimization Algorithm. For the teaching optimization algorithm, it can regard the data as a set, extract the optimal individual in the data set, improve the whole teaching quality through corresponding teaching, and realize the iterative optimization of the whole dataset. At the same time, mutual knowledge learning and mutual improvement of other data are completed through corresponding teaching communication [13, 14].

The algorithm can be divided into teacher part and student part according to different objects.

In the stage of teacher teaching, the best individual in the dataset is selected as the teacher through the simulation of teacher teaching. In the process of teaching, the knowledge accepted by students is as close as possible to their own ability.

If the number of iterations is I and the corresponding number of classes and teachers is set, the average value can be calculated:

$$\text{Difference\_Mean}_i = r_i \big(M_{\text{new}} - T_f M_i \big). \tag{1}$$

In the formula, the value range of $(\Phi(x) \cdot \Phi(x_i))$ is $(0, 1)$, T is set as the teaching factor, and quantitative calculation can be carried out according to the following formula:

$$T_f = \text{round}[1 + \text{rand}(0, 1)]. \tag{2}$$

In the teaching stage, teachers can make quantitative calculation according to formula 3 and iteratively update the solution calculated by formula 1:

$$x_{\text{new},i} = x_{\text{old},i} + \text{Difference\_Mean}_i. \tag{3}$$

If x_{new} is better than x_{old}, we accept x_{new}. Otherwise, we discard 111.

In the learning stage of students, students can often improve their own performance with the following two possibilities. On the one hand, they can learn from teachers in the learning stage. On the other hand, students can improve their knowledge and improve their ability by communicating with each other, which is the process of mutual learning. Two students were randomly selected and set as x_i and x_h, and their quantitative function values were compared. The specific calculated values were updated as shown in formulas 4 and (5):

$$f(x_i) < f(x_h), x_{\text{new},i} = x_{\text{old},i} + \text{rand}_i(x_i - x_h), \tag{4}$$

$$f(x_h) < f(x_i), x_{\text{new},i} = x_{\text{old},i} + \text{rand}_i(x_h - x_i). \tag{5}$$

2.2. Elite Teaching Optimization Algorithm. Compared with basic teaching, the elite optimization algorithm teaches different optimization algorithms and introduces elite strategies to ensure the optimization of the values of each generation. At the same time, in the repeated iteration process, the optimal iteration value is used, and maintain the diversity of the population by repeating continuous

deletion at the end of the individual update calculation [15, 16].

In the basic teaching based on the optimization algorithm, the adaptive feedback mechanism is introduced, the elite teaching optimization algorithm is constructed, and the adaptive feedback value calculation is added. In order to distinguish between class and grade students, on the one hand, the teacher pays too much attention to the students with poor grades; on the other hand, let the students with good grades communicate with them, improve their own level, and improve their abilities. For students with good grades, they are encouraged to acquire knowledge in other ways and improve learning efficiency through innovation.

In the adaptive feedback stage, the algorithm is used for several iterations. In the later stage of continuous iteration, students' grades are getting better and better. It is necessary to further improve the judgment criteria for classifying excellent and poor:

$$\lambda = \frac{i_{\max}}{i_{\max} - i + 1}, \tag{6}$$

where the number of iterations is expressed by I and the discriminant standard λf_{Mean} is used to express the excellent students and the poor students.

On the basis of the above, the adaptive feedback mechanism can be specifically expressed as follows. In the student stage, the adaptive value is firstly calculated and judged with the threshold value. If the adaptive value is greater than the criterion, it can be considered as a poor student. The communication mode between students and teachers is shown in formula 7. On the contrary, the specific calculation is shown in formulas 8 and (9):

$$f(x_i) > \lambda f_{\text{Mean}}, x_{\text{new},i} = x_{\text{old},i} \\ + \text{rand}_i(x_{\text{reacher}} - x_i), \tag{7}$$

$$f(x_i) < \lambda f_{\text{Mean}}, \text{rand} > M_r, \\ x_{\text{new},i} = x_{\text{old},i} + \text{rand} \cdot \left(\frac{i}{i_{\max}} \big(x^U - x^L \big) \right), \tag{8}$$

$$f(x_i) < \lambda f_{\text{Mean}}, \text{rand} < M_r, \\ x_{\text{new},i} = x^L + \text{rand} \cdot \big(x^U - x^L \big), \tag{9}$$

where M_r is the probability of random variation, which is 0.05 in this paper. The upper is represented by x^U; the lower is represented by x^L.

After the adaptive feedback phase, the fitness values of the new solution x_{new} and the current solution x_{old} are compared, and x_{new} is accepted if x_{new} is better than x_{old}.

Unlike traditional feedback elite optimization algorithm, the proposed adaptive elite discriminant student teaching, on the one hand, is an effective optimization algorithm, according to the fitness value of specific policy enforcement of different types of students; on the other hand, according to the actual situation is different, we set a specific number of

iterations and adjust the proportion of the top students and poor, to better conform to the actual demand.

The specific steps of elite teaching optimization algorithm under the premise of adaptive feedback mechanism mainly include

Step 1: optimize the definition of the problem and set the corresponding parameters, iteration times, etc.

Step 2: on the basis of initialization of parameter setting, the number of English teaching classes is initialized.

Step 3: evaluate the population and retain the elite solution.

Step 4: in the teacher stage, the teaching process in the teacher stage is carried out according to formula 3 to improve the overall level of the class.

Step 5: in the student stage, according to the specific formulas 4 and (5) calculation communication, we improve the corresponding results.

Step 6: in the adaptive feedback stage, the students are automatically classified, and the formula is used to communicate with the teacher according to the results. According to formulas 8 and (9), self-learning upgrading is carried out.

Step 7: use the corresponding elite value to replace the poor results and random operation.

Step 8: repeat steps 3–7 until the termination conditions are met.

2.3. Support Vector Machine.

For English teaching quality evaluation, its essence is a problem of classification. This paper adopts support vector machine to implement it and specifically builds the following hyperplane, as shown in the following formula:

$$y = \omega^T \Phi(x) + b. \tag{10}$$

The optimal hyperplane is established on the basis of formula 10, as shown in the following formula:

$$\min J(\omega, \xi) = \frac{1}{2}\|\omega\|^2 + C \sum_{i=1}^{n} \xi_i,$$

$$\text{s.t. } y_i(\omega \cdot \Phi(x_i) + b) \geq 1 - \xi_i, \quad \xi_i \geq 0, i = 1, 2, \ldots, n, \tag{11}$$

where C represents the penalty parameter of the result of misclassification.

In order to speed up learning, Lagrange multipliers are introduced to obtain dual problems. In this way, the hyperplane classification function is as follows:

$$f(x) = \text{sgn}\left(\sum_{i=1}^{l} \alpha_i y_i (\Phi(x) \cdot \Phi(x_i)) + b\right). \tag{12}$$

Kernel function $K(x_i, x)$ is used to replace dot product operation $(\Phi(x) \cdot \Phi(x_i))$ to simplify the classification process of support vector machine. Equation (13) becomes

$$f(x) = \text{sgn}\left(\sum_{i=1}^{l} \alpha_i y_i K(x_i, x) + b\right). \tag{13}$$

The evaluation index steps are as follows

(1) The index values of English teaching quality evaluation should be standardized, as shown in the following formula:

$$\overline{x}_{ij} = \frac{(x_{ij} - \overline{x}_j)}{s_j}. \tag{14}$$

The details are shown in the following formula:

$$\begin{cases} \overline{x}_j = \frac{1}{n} \sum_{i=1}^{n} x_{ij}, \\ s_j = \frac{1}{n-1} \sum_{i=1}^{n} (x_{ij} - \overline{x}_j)^2. \end{cases} \tag{15}$$

(2) The correlation coefficient matrix is calculated, and it is shown in the following formula:

$$R = (r_{ij})_{p \times p},$$

$$r_{ij} = \sum_{k=1}^{n} \frac{\overline{x}_{ki} \overline{x}_{kj}}{(n-1)}, \tag{16}$$

where r_{ij} represents of the evaluation sample.

(3) By solving characteristic equation $\lambda u = Ru$, eigenvalues $\lambda = (\lambda_1, \lambda_2, \ldots, \lambda_p)$ and $\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_p \geq 0$ and corresponding vectors $u = (u_1, u_2, \ldots, u_p)$ and $u_j = (u_{1j}, u_{2j}, \ldots, u_{pj})$ can be obtained.

2.4. The Connotation and Characteristics of Multimedia Teaching.

(1) Diversification of information presentation: any information can be expressed through one or more media, and the diversified presentation of information can accurately and effectively express information.

(2) Individualization of teaching methods: the multimedia system can not only be used to assist classroom teaching but also can be used to give individual tutoring to students.

(3) The diversification of learning methods: as a tool to assist teachers and students to implement teaching activities, multimedia can be used in different ways according to different objective conditions and environments. In different ways, teachers, students, and media have different positions and roles.

(4) Autonomy of learning environment: students can choose the most effective way to learn which they like.

(5) The teaching environment is changed from static to dynamic: teaching is completed through human-
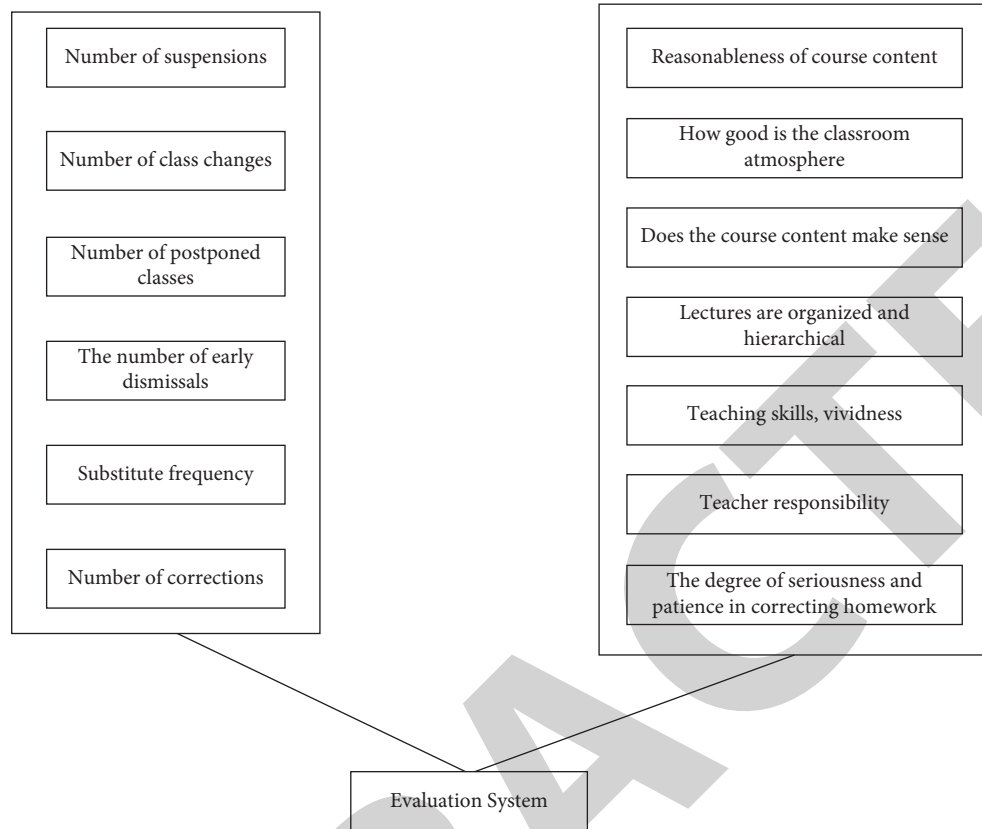
FIGURE 1: Evaluation index of English teaching quality.

computer interaction, which makes the whole teaching environment from static to dynamic change.

3. English Multimedia Teaching Quality Evaluation Model Based on Elite Teaching Optimization Algorithm

3.1. To Construct an Evaluation Index System of English Teaching Quality. This paper constructs evaluation indicators from two aspects, one for teachers and the other for students, as shown in Figure 1.

3.2. The Working Steps of the English Teaching Quality Evaluation Model. The steps of the English teaching quality evaluation model based on data mining are as follows:

 (1) Collect data related to the English teaching of specific teachers in the school

 (2) According to the English teaching quality evaluation index system, the data are processed accordingly, which construct the learning samples

 (3) The data scale can be effectively reduced by processing the original learning samples based on the results

 (4) Select part of the data to form the training sample of English teaching quality evaluation, and use it to establish the classifier

To sum up, the working process is shown in Figure 2.

4. Simulation Experiment and Analysis

4.1. The Data Source. Related data are collected according to the 13 evaluation indexes in Figure 1. A total of 200 samples are obtained, and part of the data is shown in Figure 3, where x_1 represents the number of class suspension, x_2 represents the number of class adjustment, and so on, x_{13} represents the degree of seriousness and patience in correcting homework, and y represents the level value of English teaching quality.

4.2. Results of Principal Component Analysis Algorithm. Through the principal component analysis of the data in Figure 3, the result (Figure 4) is obtained. The cumulative contribution rate analyzed in Figure 4 shows that the top 5 contribution rates of the cumulative contribution rate exceed 85%.

4.3. Determining the Kernel Function of Support Vector Machine. In the process of quality evaluation, the choice of kernel function of support vector machine (SVM) is very important for the quantitative evaluation of English teaching quality evaluation results; this paper uses several kinds of commonly used kernel function performance testing; the results are shown in Figure 5. The test results of Figure 5 are analyzed, the performance of the elite teaching optimization algorithm is proposed. Therefore, this kernel function is used to evaluate the quality of English teaching.
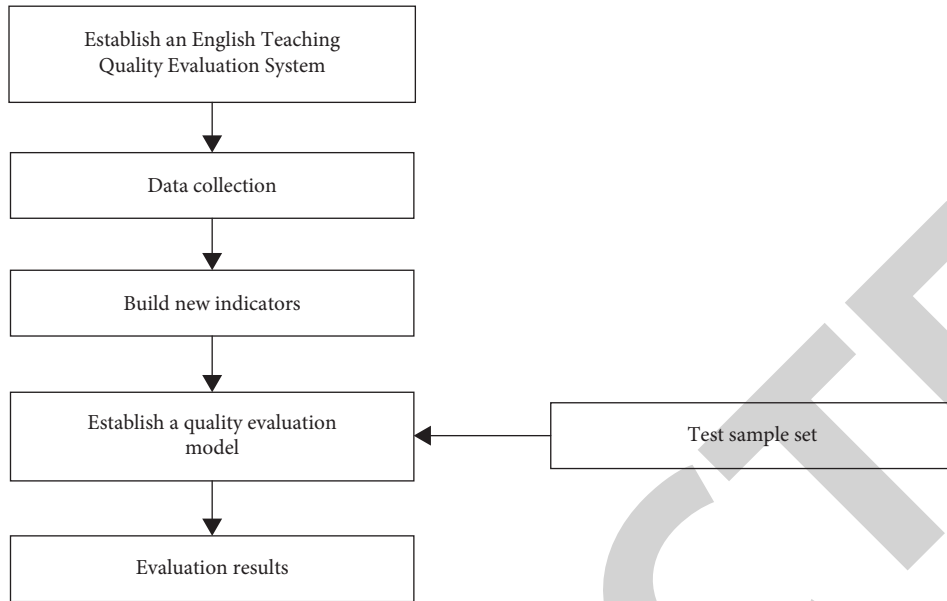
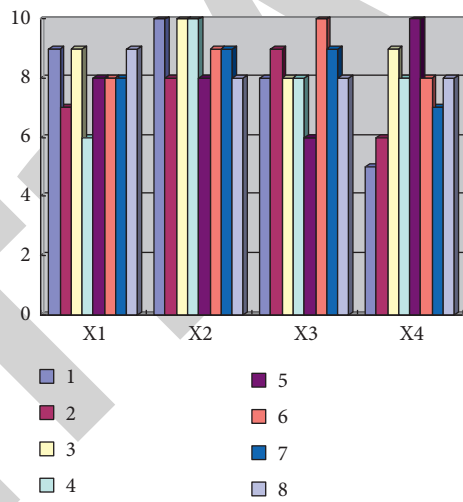Figure 2: Process of English teaching quality evaluation.
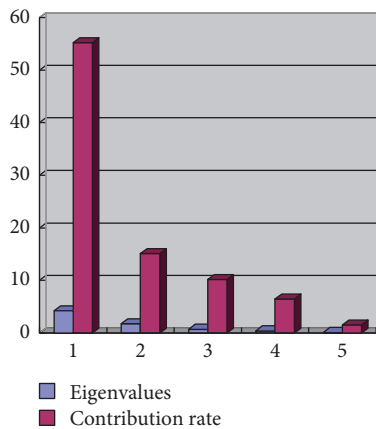

Figure 3: Experimental data.

Figure 4: Index processing results of elite teaching optimization algorithm.
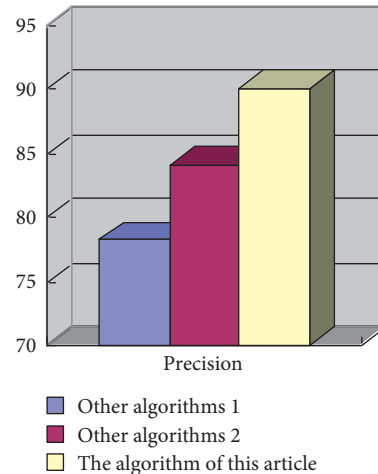
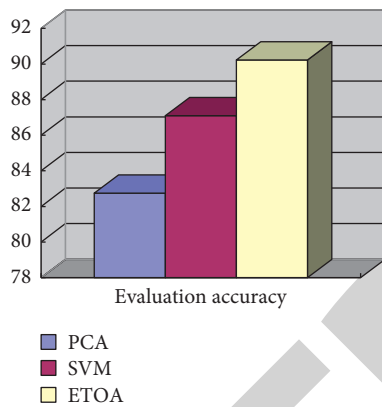Figure 5: Performance comparison of different kernel functions.

Figure 6: Performance comparison with other English teaching quality evaluation models.

4.4. Evaluation Results of English Teaching Quality. The quality of multimedia teaching was evaluated using elite optimization teaching algorithm, and 50 evaluation results were obtained. The corresponding model is used to evaluate the teaching quality, which can effectively support for English teaching.

The elite teaching optimization algorithm and support vector machine method are used to conduct simulation experiments for teaching quality comparison, and the results are shown in Figure 6:

(1) The evaluation accuracy of PCA is the lowest in teaching evaluation. Although there are fitting defects, the accuracy of samples differs greatly, which affects the evaluation results of value, and it cannot meet the actual needs and has poor applicability.

(2) The English teaching quality assessment of support vector machine (SVM) is lower than that of the model accuracy because the English teaching quality evaluation index, which interferes with each other, cannot get accurate evaluation accuracy; therefore, based on the principal component analysis, with access to better English teaching evaluation, the

evaluation is more efficient and the evaluation of the speed and efficiency is increased. It improves the efficiency of English teaching quality evaluation.

5. Conclusions

As one of the important skills in international communication, English has been paid more and more attention. Therefore, improving the quality of English teaching can effectively promote English learning. This paper attempts to introduce the elite teaching optimization algorithm, try to build the English teaching quality evaluation model, use the corresponding evaluation index for evaluation analysis, optimize and select the teaching quality by principal component analysis, remove the indicators that are not obvious, improve the evaluation speed, and improve the efficiency of evaluation. The simulation results show that the elite teaching optimization algorithm can effectively support the quality analysis of English multimedia teaching and is effective.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflicts of interest.

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