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Research Article

Construction of Artificial Intelligence Music Teaching Application Model Using Deep Learning

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This paper investigates AI-based interactive music design and proposes a new music learning mode. It aids in the development of students' inquiry skills and allows teachers to take the lead. At the same time, this paper systematically introduces the status of DL theory's application in music teaching evaluation and uses DL theory to develop a mathematical model for an AI music teaching evaluation system. The construction method of an AI music teaching evaluation model based on DL is detailed in this paper. The model can assess the quality of AI music teaching after the network has been trained. The designed instructional quality evaluation NN is trained and measured in this paper to verify the model's performance. The experimental results show that this model has a prediction accuracy of 94.79 percent, which is approximately 8.52 percent higher than the traditional methods. It has some practicality and feasibility, and it can serve as a useful benchmark for the development of various instructional quality evaluation systems.

1. Introduction

Currently, AI (Artificial Intelligence) application research in educational theory and practice is exploding, and it has emerged as a critical entry point for educational advancement. The use of artificial intelligence (AI) in computer-assisted music instruction demonstrates a certain necessity and positive significance of the times. Theoretical AI research has expanded significantly in recent years, with topics such as Bayesian networks, deep learning [1, 2], and general AI being among them. AI is a type of artificial intelligence [3, 4] that uses computers to mimic human perception, reasoning, and other cognitive functions. With the advancement of art education and information technology, more computer and multimedia technologies are required in current music teaching activities in order to cultivate students' abilities. CAI (Computer Assisted Instruction) is the use of computers to replace teachers in the classroom and compile instructional content into various coursewares, allowing learners to select different contents for learning based on their own circumstances. As a result, instructional content is diversified and visualised, making it easier to teach students according to their aptitude. Applying AI and Internet information technology to music education and teaching activities can improve the efficiency and level of education. In general, CAI requires the use of AI technology and the compilation of complex programmes such as natural language understanding, knowledge representation, and reasoning methods. Music education benefits from AI in a unique way [5]. AI will bring new changes to music education's teaching mode and theory; in particular, it will bring new changes to teaching means and instructional methods, allowing music education to provide more positive practical value in the Internet era.

In the education industry, improving the education quality is a perennial topic. Instructional quality evaluation's scientificity, rationality, and timeliness are all important factors in improving the educational quality. There is currently no extremely fair, reasonable, or scientific method for evaluating college teachers' teaching abilities. Mathematical methods are frequently used in the evaluation of instructional quality in institutions of higher learning in order to make it more scientific. Its research and practice in measuring instructional quality, such as the instructional quality evaluation system and evaluation model, are somewhat behind the times. With its superior basic characteristics, deep learning has created a new way of thinking for artificial intelligence research as a new technology. Based on modern neuroscience research, the NN (neural network) [6–8] theory creates an information processing system that mimics the way the human nervous system processes, remembers, and processes information [9]. Back propagation neural networks (BPNNs) [10] are a type of NN with strong nonlinear mapping capabilities. As a result, solving the nonlinear relationship problem of teachers' teaching evaluation is both feasible and scientific. The introduction of DL-related technology into the field of AI music teaching for instructional quality evaluation will enrich education and teaching theory, promote the change of teaching link evaluation methods, and provide a foundation for scientific and quantitative evaluation of instructional quality, all of which will be of great theoretical and practical value.

This paper focuses on the effectiveness evaluation of AI music teaching based on DL theory and from the perspective of knowledge construction. The following are some of its innovations:

(1) This paper constructs an instructional quality evaluation model based on DL by analysing the advantages and disadvantages of previous instructional quality evaluation methods and summarising the existing instructional quality evaluation model methods, aiming at the limitations of the existing evaluation methods. Then, using the Matlab toolbox's powerful functions, each evaluation index is used as an input and the evaluation target is used as an output; train the network, test the network, and finally analyse the experimental results.

(2) Because the initial weight and threshold of the BPNN are so important, this paper uses an improved genetic algorithm to optimise the NN's initial weight and threshold and reduce the time it takes for the BPNN to find the weight and threshold that meet the training termination conditions. To avoid affecting the prediction effect due to the complexity of the network model, the improved principal component analysis method is used to reduce the dimension of the evaluation index on the premise of retaining a large amount of original information. According to the findings, the improved method improves the accuracy and speed of BPNN prediction for music instructional quality evaluation results.

2. Related Work

Artificial intelligence has made significant progress in a variety of fields [11], forming a diverse and multifaceted development path. Simultaneously, artificial intelligence technology has become increasingly prevalent in the field of music, and the combination of artificial intelligence and music education has yielded numerous research results. However, evaluating the teaching quality of artificial intelligence music is a difficult problem with many influencing factors and dynamic variables. Scholars from both the United States and other countries have conducted extensive research on the subject.

Spooren et al. designed the instructional quality assurance system, extracted the important factors that affect the evaluation of instructional quality, and put forward the implementation countermeasures for the key factors, which provided a more reasonable and effective system for the guarantee of instructional quality [12]. Donlan and Byrne conducted research on the construction of practical teaching system in institution of higher learning, and provided reliable theoretical support for the evaluation of instructional quality in practical institution of higher learning through empirical research [13]. Hou et al. combined with the actual situation of teaching evaluation, put forward the evaluation index suitable for teaching evaluation; The basic principle and algorithm of principal component analysis are introduced in detail [14]. Johnson et al. applied AHP and NN in the instructional quality evaluation model [15]. Beuth et al. explored the optimization of the student evaluation system and the influencing factors of instructional effect, which provided a reliable and effective realistic basis for the research of talent cultivation and education quality evaluation [16]. Yang and Welch gave the theory and advantages of algebraic algorithm, and applied it to NN instructional quality evaluation model. The analysis results are shown by specific examples, and the results show the effectiveness of modeling instructional quality by NN algorithm [17]. Du and Slipinski proposed to adopt fuzzy comprehensive evaluation method and analytic hierarchy process, and combine qualitative and quantitative methods to make the evaluation results more reliable and scientific [18]. Zhang and Wang put forward a teaching evaluation model based on BPNN. Different evaluation systems are adopted when evaluating different disciplines and specialties, in order to make the evaluation more reasonable, scientific, and objective [19]. According to the complexity of instructional quality evaluation process, He and Li proposed an instructional quality evaluation system based on NN algorithm by using the structural characteristics of NN. And the mathematical model of the system is determined [20]. Li et al. from the horizontal perspective of the teaching process, set the instructional quality evaluation system with five aspects of teachers' quality, instructional attitude, instructional content, instructional methods, and instructional effect as the first-level indicators for the second-level evaluation indicators [21].

This paper proposes a new research perspective and method based on DL and AI music teaching research in related literature. This paper focuses on the effectiveness evaluation of AI music teaching from the perspective of DL. This paper primarily discusses the establishment of an evaluation index system, the selection of indexes, and the setting of index weights in light of the current shortcomings and problems in instructional quality evaluation. To determine the feasibility of evaluating instructional quality, the data-based entropy method is introduced, and prior guidance samples are obtained using the entropy method. The adaptive mutation genetic algorithm is then used to optimise the NN model in order to learn prior sample knowledge and create the evaluation model. This model reduces the subjectivity of NN learning samples and verifies the effectiveness and accuracy of the instructional quality modeling in this paper, according to the findings.

3. Methodology

3.1. AI Music Teaching. CAI (Intelligent Computer-Assisted Instruction System) takes cognitive science as the theoretical basis and applies AI technology to CAI, which is an intelligent CAI [22]. Intelligent system can play a good auxiliary role for students to learn music knowledge and provide better educational means. It has certain practical value and positive significance for the research of music teaching [23]. CAI is actually an expert system assisted by computer system for teachers' teaching and students' learning. Music knowledge learners access the learning combination through logging in the client, which is generally a learning platform, and then present the learning results to the teachers through human-computer interaction mode. Teachers improve the new teaching mode and teaching mode through performance, improve learners' learning awareness and learning ability based on negative feedback, and form a perfect interactive closed loop. At the same time, AI technology also provides students with a large number of e-learning resources and services. In order to organize the instructional design theory, we can analyse the main contents of the instructional system, and then organize the instructional design theory system according to the main contents. We believe that the teaching system can be abstractly divided into guiding theory, learners, educational technology, learning behavior, information resources, teaching objectives, and other main contents, which have certain interaction.

The combination of AI and music has been around for a while. Teaching ideas, methods, and learning contents can all be expressed as knowledge in ICAI [24]. From a macro perspective, instructional mode is a stable state of grasping the entire teaching activity and the internal relationships among its elements. AI is an application technology that makes use of big data network resources. As a result, AI technology has been used in the process of music teaching activities to integrate and analyse a large number of students and their music learning-related data. It is possible to share learning resources when you invest in AI education. With the advancement of AI technology, significant changes in teaching concepts, instructional content, and instructional methods will occur, necessitating teachers to improve their overall teaching design ability and level. At the same time, AI and blockchain technology can help educators create a collaborative platform. At the same time, blockchain technology can protect students' privacy and ensure the integrity of their data. The application architecture of AI music teaching is shown in Figure 1.

The integration and analysis of AI technology for students' music learning data is helpful for teachers to understand each student's innate learning foundation, the mastery of basic music theory knowledge, and music performance ability, etc., and can be used as a basis to take targeted measures to guide students to further improve their music learning ability, especially their music performance ability. I can guide the comprehensive teaching design theory in the construction of an AI modular teaching model based on the requirements of AI for advanced nature and adaptability. To implement the comprehensive learning theory and achieve meaningful comprehensive learning in the target traction learning analysis, we should use an object-oriented method. In comparison to traditional evaluation methods, an AI-based teaching system uses developmental feedback and rational application of emotional evaluation to increase the teaching efficiency of music students. AI technology can provide each registered user with a unique learning plan tailored to their specific needs. The AI-created learning plan differs significantly from traditional educational learning plans. Students' potential can be developed more effectively with AI personal exclusive learning plans. The intelligent learning environment facilitates the implementation of the intelligent teaching strategy while also demonstrating advanced technology. In order to better provide positive practical value for music education in the Internet era, AI has brought new changes to the teaching mode and teaching theory of music education, especially in teaching means and instructional methods. Simultaneously, AI English teaching is conducive to expanding the knowledge capacity of the music classroom, attracting students' interest in learning, improving the efficiency of music classroom teaching, recording archives, and providing a foundation for students' follow-up music learning activities, all of which are worthy of promotion.

3.2. Construction of Music Teaching Evaluation Model Based on DL. DL is a subset of an artificial NN-based machine learning method. Unsupervised, semi-supervised, or supervised DL are all possibilities. Deep neural networks, deep belief networks, cyclic neural networks, and convolution neural networks are all being used in various fields right now. Artificial NN is an intelligent system that people use to imitate the information processing function of the human brain nervous system [25]. It is the most basic abstraction and simulation of the human brain. The BPNN is a feedforward hierarchical network with three layers: input, hidden, and output. NN can be thought of as a high-dimensional nonlinear dynamic system with neurons as processing units from the perspective of automatic control. This system has multiple inputs and outputs, and the input-output relationship can be thought of as a mapping from input to output. The three-layer BPNN model is shown in Figure 2.

The design goal of this model is to establish an effective teaching evaluation model and realize the corresponding AI music teaching evaluation by analysing the existing

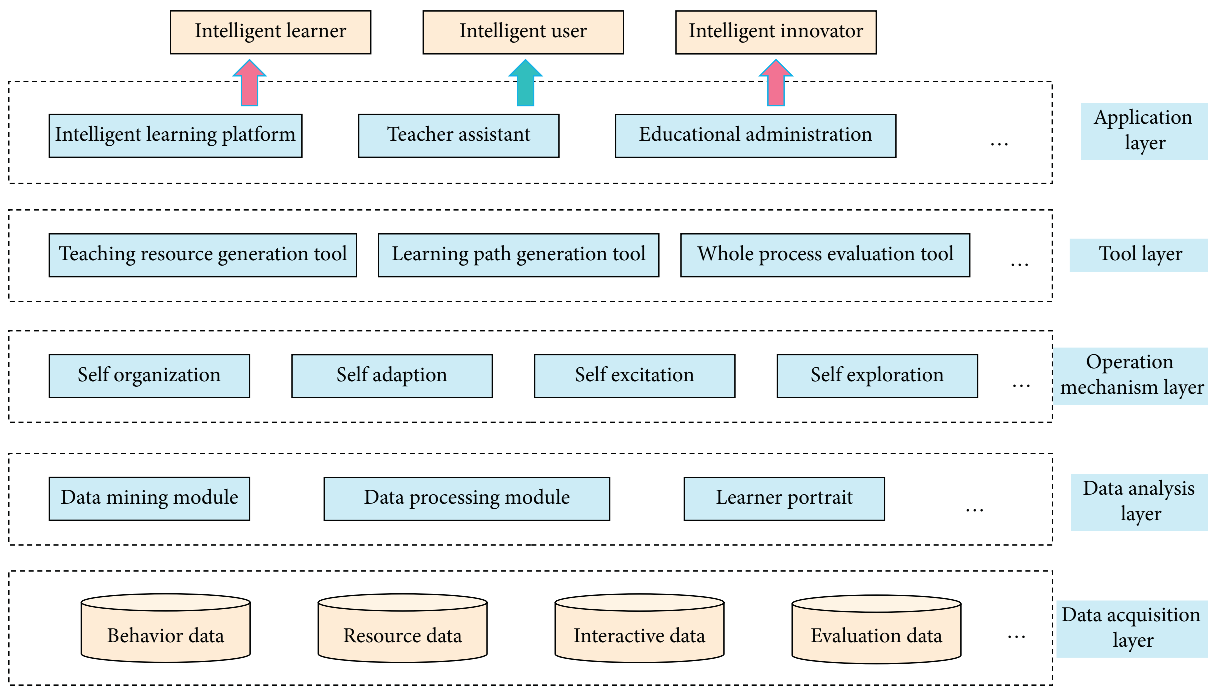

Figure 1: Architecture of AI music teaching application.

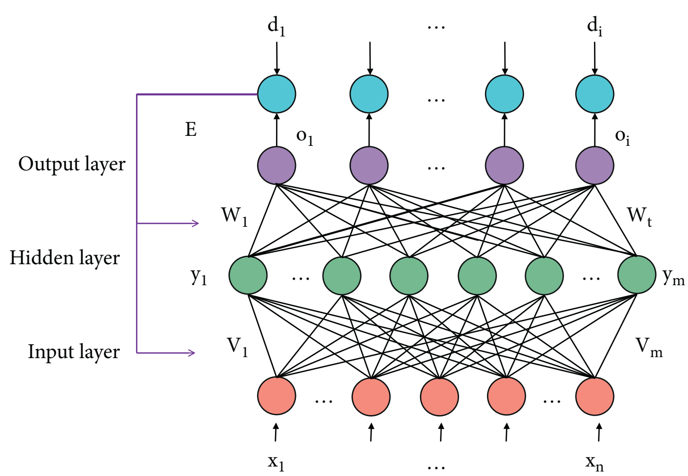

Figure 2: Three-layer BPNN model.

evaluation indexes and methods. As for an instructional quality evaluation system, it can be regarded as a mapping from input to output. NN's self-learning ability, that is, the plasticity of mapping, enables it to simulate the required mapping relationship through training, so as to replace domain experts to automatically evaluate the evaluated objects. The nonlinear approximation ability of BPNN is reflected by the S-shaped activation function, so the S-shaped activation function is generally used in the hidden layer. The activation function of the output layer can be linear or S-shaped. Although BPNN can approximate any nonlinear function with arbitrary precision, it has strong practicability for solving nonlinear problems, but it also has many shortcomings. For example: (1) easy to fall into local minima. (2) The determination of hidden layer lacks of theoretical basis. (3) Poor convergence and low efficiency. (4) Poor generalization ability. Therefore, this paper introduces the adaptive mutation genetic algorithm, which improves the mutation operation in the genetic algorithm, and the mutation operation helps to improve the diversity of the genetic algorithm population. At present, the mutation probability is obtained through continuous experiments. Openness, self-organization, complexity, integrity, and relevance are the common basic characteristics of all systems. The establishment of instructional quality evaluation index system in this paper follows the following principles: consistency principle, independence principle, comprehensiveness principle, fault tolerance principle, incentive principle, and feasibility principle. The evaluation problems in this paper are divided into two aspects: index scoring and grading and classification, so two networks can be used to deal with them. A network stores and memorizes the importance coefficient of each index and synthesises the scores, which is called a comprehensive network. The other one classifies the index scores linearly or nonlinearly, so as to obtain the final evaluation result of the total index, which is called classification network.

Taking the three-layer feedforward network as an example, the BPNN algorithm is introduced. In a three-layer feedforward network, the input vector is

$$X = (x_1, x_2, x_3, \ldots, x_i, \ldots, x_n)^T. \quad (1)$$

The hidden layer output vector is

$$Y = (y_1, y_2, y_3, \ldots, y_j, \ldots, y_m)^T. \quad (2)$$

The output layer output vector is

$$O = (o_1, o_2, o_3, \ldots, o_k, \ldots, o_l)^T. \quad (3)$$

The expected output vector is

$$d = (d_1, d_2, d_3, \ldots, d_i, \ldots, d_n)^T. \quad (4)$$

The weight matrix between the input layer and the hidden layer is expressed by the following formula:

$$V = (V_1, V_2, V_3, \ldots, V_j, \ldots, V_m)^T. \quad (5)$$

Trial-and-error method is one of the methods to determine the number of hidden layer nodes. There are three ways to determine the initial value of the trial method, as shown in the following formula. In this paper, empirical formula (7) is used to determine the number of initial hidden layer nodes.

$$m = \sqrt{n + l} + a, \quad (6)$$

$$m = \log 2^n, \quad (7)$$

$$m = \sqrt{nl}. \quad (8)$$

Among them, w is the number of hidden layer nodes, n is the number of input layer nodes, l is the number of output layer nodes, and a is a constant between 1 and 10. The more commonly used nonlinear transfer function is the hyperbolic function formula:

$$f(x) = \frac{1}{1 + e^x}. \quad (9)$$

As the function of BPNN is actually completed through the calculation of network input to network output; therefore, the more hidden layers, the slower the learning speed of NN. Because BPNN with only one hidden layer can approximate any nonlinear function, this paper first tries to set a hidden layer. Choose 3-layer BPNN with relatively simple structure. To make an objective and correct evaluation of an object, I must first examine the main indexes that influence the evaluation results, as well as their proportions. Because each index in the evaluation system has a different degree of influence on the evaluation results, different weights should be assigned. However, many institutions of higher learning still use the same weight or subjectively determine a weight distribution table to establish an evaluation system for the sake of convenience, which not only reduces the credibility of the evaluation results, but also makes it difficult to mine evaluation data further. As a result, a rational weight distribution is a critical step in improving the evaluation system. To form an overall evaluation of instructional quality, experts and students must evaluate and score the indicators, and the quality grade coefficient of each evaluation content can be calculated using reasonable procedures and scoring methods. It is necessary to synthesise the grading standard coefficient of the total index according to the proportion of each index after analysing and evaluating each index of the evaluation object and obtaining the corresponding grade coefficient.

The standard BPNN only adjusts the weights in the gradient direction of the error at time t, and does not consider it before time t, resulting in oscillation and slow convergence. Increasing the momentum term can reduce the oscillation and improve the convergence speed. Use the BP training algorithm to correct Δw_{it} and Δw_{ji}, and the correction formula is as follows:

$$\begin{aligned} \Delta w_{it} &= Z \sum_{i=1}^{k} (t_t - y_t) F'(S_t) h_i, \\ \Delta w_{ji} &= Z \sum_{i=1}^{k} \sum_{j=1}^{m} (t_t - y_t) F'(S_t) w_{it} F'(S_i) x_j. \end{aligned} \quad (10)$$

The weight adjustment formula with an additional momentum factor is

$$\Delta W(t) = \eta \delta X + \alpha \Delta W(t-1). \quad (11)$$

Among them, W is the weight matrix, X is the input vector, and α is the momentum coefficient. Usually for the error function, if the number of learning increases, the $|d_k^p - o_k^p|$ will become smaller and smaller, which may lead to slower function approximation.

$$\begin{aligned} E &= \frac{1}{2}\sum_{P=1}^{P}\sum_{K=1}^{M} In\left[1+\left(d_k^p - o_k^p\right)^2\right], \\ E &= \frac{1}{2}\sum_{P=1}^{P}\sum_{K=1}^{M}\left(d_k^p - o_k^p\right)^2 + \frac{1}{2}\sum_{P=1}^{P}\left[\sum_{K=1}^{M}\left(d_k^p - o_k^p\right)^2 \cdot \sum_{j=1}^{H}\left(h_{Rj} - 0.5\right)^2\right], \\ E &= \frac{1}{2}\sum_{P=1}^{P}\sum_{K=1}^{M}\left(d_k^p - o_k^p\right)^2 + p(w), \\ p(w) &= \frac{\lambda}{n}\sum_{ij}\left|w_{ij}\right|^n, \end{aligned} \quad (12)$$

where E is the error function and η is the training rate coefficient.

After the network topology and training data are determined, the properties of the total error function are completely determined by the activation function. Improving the activation function can change the error surface and minimize the possibility of local minimum. In data analysis, the samples involved often contain many variables, and more variables will bring the complexity of the analysis problem. I hope that there are fewer variables involved in quantitative research and more information can be obtained. It is this information overlap between variables that makes it possible to reduce the dimension of variables, thus simplifying the analysis of problems. The standard BPNN algorithm only adjusts the weight of the return error, which will increase the number of training times and lead to the slow convergence speed. In order to solve this problem, this paper introduces batch training method. This training method ensures that the error is always in a reduced state and can improve the convergence speed. Its working principle is: when the input layer inputs samples, the total error of the whole network is calculated at this time, instead of the error of a single sample, and then the corresponding errors of each layer are calculated through the total error, and the weights are adjusted. In this paper, the evaluation results of each index of the evaluation object are usually expressed by different grades or states. The evaluation grade of this paper is divided into five grades: excellent, good, medium, poor, and failed. These grades or states are qualitative or quantitative evaluations of the evaluation contents. The final evaluation result depends on two problems, one is the evaluation and scoring of the content, and the other is the formulation of grading criteria.

4. Result Analysis and Discussion

Teaching process is a complicated thinking process of teaching and learning. It needs teachers' specialized knowledge and experience as the basis, and can be completed well through absorption, explanation, reasoning, examples, and synthesis. In this paper, the improved BPNN is adopted to construct the AI English teaching evaluation model. To verify the performance of the model, simulation experiments are carried out in this chapter. In this paper, students' teaching evaluation data is used as input value, and experts' teaching evaluation data is used as expected output value. Using the algorithm in this paper, a simulation program is designed under Matlab to identify the AINN model. The number of nodes in input layer, hidden layer, and output layer is $16 \times 4 \times 1$, respectively; The learning rate is 0.9; Sigmoid function is adopted for each node function. Different algorithms are used for error experiments, and the average absolute errors of different algorithms are shown in Figure 3.

It can be seen that the improved BPNN in this paper can establish an AI music instructional quality evaluation model. And the error of this algorithm is smaller than other algorithms. It shows that the algorithm in this paper has certain accuracy. Comparing the output value of AI music instructional quality evaluation model with the real value, the result is shown in Figure 4.

According to the data analysis in Figure 4, the error between the output value and the real value of this model is relatively small. This result shows that the performance of this model can meet the needs of practical application. In this paper, there are two ways to set the network to stop training, one is to control through the error range, the other is to reach the maximum number of iterations, and one of the two conditions can stop training. The convergence results of different networks are shown in Figure 5.

It can be seen that the convergence speed of this network is fast. In order to better illustrate the superiority of this algorithm, the improved algorithm is compared with the algebraic algorithm and traditional BPNN, and the results are shown in Table 1.

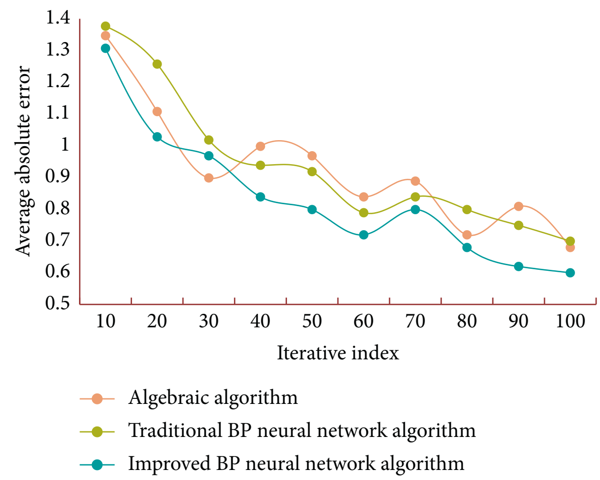

Figure 3: Mean absolute error of different algorithms.

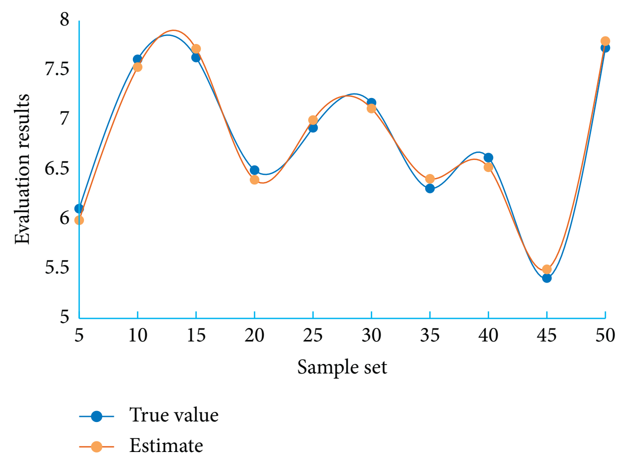

Figure 4: Comparison results of model output value and real value.

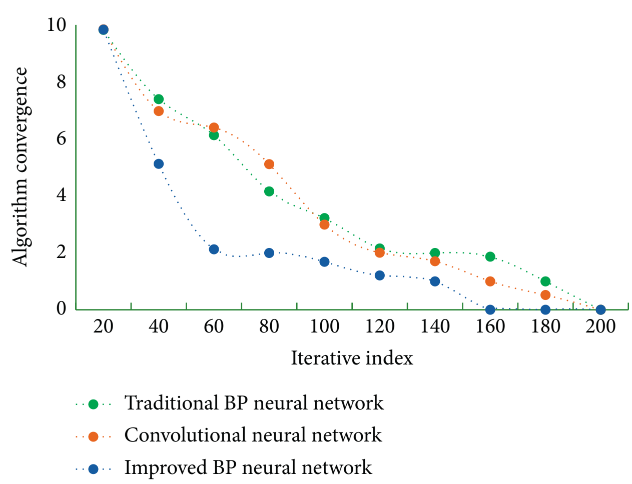

Figure 5: Convergence results of different networks.

It can be seen from the table that, for a given scale problem, the algorithm in this paper can achieve high calculation accuracy within tens of seconds; Algebra is second. However, the calculation accuracy of BPNN is much worse, and the calculation takes more time. Generally speaking, the number of training samples is about 8 times of the total network connection weights. Figure 6 shows the fitness of the improved BPNN model in this paper.

Table 1: Comparison of different algorithms.

Algorithm	Number of neurons in hidden layer	10	20	30	40	50
Traditional BPNN algorithm	Accuracy	46.32	51.42	59.94	62.37	79.54
	Time consuming	78.4	92.6	113.5	156.7	231.5
Improved BPNN algorithm	Accuracy	59.74	68.34	74.86	82.37	90.68
	Time consuming	0.5	1.5	3.1	5.7	6.9
Algebraic algorithm	Accuracy	58.65	61.34	66.87	71.49	83.12
	Time consuming	12.3	22.5	31.4	39.7	45.3

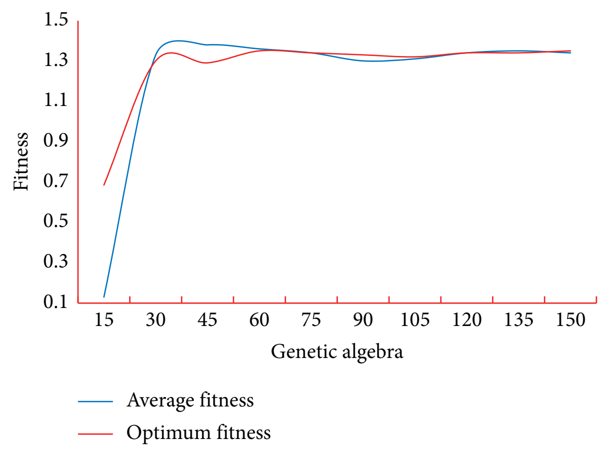

Figure 6: The fitness of the improved BPNN model.

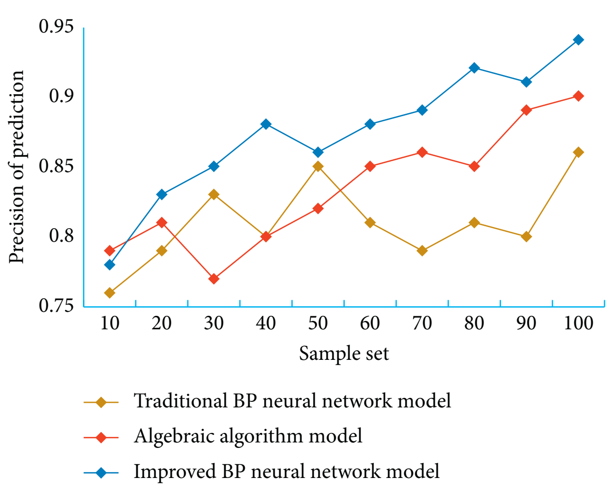

Figure 7: Prediction accuracy results of the model.

Figure 6 shows that the fitness of the improved BPNN model converges to the 50th iteration, and the fitness value is stable at about 1.35. It can be seen that the improved model has higher adaptability and has been optimised to some extent. Through training, quantifiable classification criteria or experts' experience information that is not easy to quantify are stored in the nonlinear network. The new experimental data are used to measure the instructional quality evaluation NN. The prediction accuracy of the model is shown in Figure 7.

It can be seen that the prediction accuracy of this model is at a relatively high level, and its accuracy is higher than

Table 2: Comparison of model training results.

Sample	Traditional BPNN		Improved BPNN	
	Predicted value	Error (%)	Predicted value	Error (%)
1	7.14	6.94	6.34	2.11
2	7.38	10.31	8.21	2.36
3	7.01	9.87	5.24	0.64
4	7.34	3.65	6.78	2.17
5	7.25	6.74	6.42	1.37
6	6.79	7.48	7.74	2.16
7	6.87	12.61	7.69	0.14
8	7.52	18.02	5.84	0.23
9	6.98	5.61	7.89	1.14
10	7.23	6.74	7.44	0.24

that of the comparison algorithm. In this chapter, the experiment is carried out again, and the results of instructional quality evaluation model training based on algebraic algorithm, BPNN, and the improved algorithm in this paper are compared. The results are shown in Table 2.

According to the above data analysis, if the qualitative evaluation method is preferred, the evaluation results will be easily influenced by the evaluators' subjective factors, which will lead to the randomness of the evaluation. If the quantitative evaluation method is preferred, the evaluation process and evaluation results will fall into dogmatic data, ignoring the exploration of the innovative consciousness of the object, and the embodiment of its value. In this paper, the comprehensive evaluation value of experts after many lectures is used as the expected output index, and such sample data is used to train the network. It embodies the combination of quantitative and qualitative ideas in instructional quality evaluation. Through many experiments in this chapter, the results prove that the evaluation method in this paper has certain superior performance and feasibility. And the prediction accuracy of this model is as high as 94.79%, which is about 8.52% higher than that of the traditional methods. At the same time, the experiment shows that AI music teaching has some positive effects in stimulating students' interest in music learning and improving students' music achievements. It is effective and feasible to use AI in music teaching.

5. Conclusions

This paper discusses the advantages and limitations of AI technology in music education. Each registered user can receive an individual learning plan tailored to their specific needs thanks to AI technology. The AI-customized learning plan is fundamentally different from the traditional educational learning plans, and the AI-customized learning plan can more effectively develop students' potential. AI technology will mature and be applied to music education in the future, bringing great convenience and efficiency to music teaching. At the same time, this paper evaluates the effectiveness of AI music teaching from a DL perspective. This paper describes the general structure and algorithm of a NN evaluation system based on the characteristics of instructional quality evaluation. The weight of the index system is determined using an improved BPNN with better function approximation and fault tolerance, resulting in scientific and reasonable evaluation results. Experiments show that the prediction accuracy of this model is as high as 94.79%, which is about 8.52% higher than that of the traditional methods. It is applicable to the evaluation of complex nonlinear systems whose grading criteria are not easy to be analytically expressed, and has certain practicability and feasibility. At the same time, practice has proved that AI music teaching plays a positive role in stimulating students' interest in music learning and improving students' music performance. Using AI in music teaching is effective and feasible. Although this paper has achieved some research results, there are still some shortcomings and areas to be improved in the research process. In the next step, we will do more in-depth data mining and sorting on the data of music instructional quality evaluation, so as to better serve the instructional quality evaluation.

Data Availability

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

Conflicts of Interest

The author does not have any possible conflicts of interest.

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