Research Article

Design of Adaptive Iterative Reconstruction Method for Music Curriculum Integration and Reconstruction

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Today, when music education generally attaches great importance to the construction of the subject curriculum, it is of practical significance to increase the research and implementation of curriculum integration and reconstruction. Curriculum integration and reconstruction not only provide a scientific concept guide for the formation of a good educational joint force in music education but also play an important role in the educational reform that focuses on human harmony and subsequent development. For the integration and reconstruction of music courses, this paper evaluates the teaching quality after integration and reconstruction through the neural network and then iterates the method of integration and reconstruction, so as to achieve the optimal effect. This paper introduces the development status of curriculum integration and reconstruction at home and abroad and provides a theoretical basis for the construction of the corresponding index system in the following sections. The related principles of Convolutional Neural Network (CNN) and Generalized Regression Neural Network (GRNN) are introduced, and an education quality evaluation system for music courses is constructed. We constructed a custom data set and introduced the design ideas and the specific parameter settings of the CNN-GRNN model. In addition, the CNN-GRNN model and the CNN-BP (CNN backpropagation) model are compared and analyzed in terms of the quality assessment accuracy of music courses. The results show that the CNN-GRNN model proposed in this paper outperforms the other methods. The mean squared error (MSE) of the model using one-dimensional convolution is lower than that of the CNN-GRNN model using two-dimensional convolution. As compared to CNN-BP model, the CNN-GRNN model outputs results that are closer to the expert evaluation results and the error is small.

1. Introduction

With the development of society, China now needs a large number of high-level technical and skilled talents [1]. In recent years, with the emergence of problems such as the decline in the enrollment of students, the decline in the registration rate of freshmen, and the increasing difficulty of graduate employment, some deep-seated problems in the running of local undergraduate colleges and universities have gradually emerged, which makes us have to reexamine the running of local undergraduate colleges and universities (CAU) [2]. At present, China is in the historical stage of industrial transformation and upgrading and rapid development of public services. Local CAU should seize this historical development opportunity, take the vocational demand-oriented school-running concept, strengthen the training of applied talents, innovate the talent training model, and focus on the implementation of the integration of production and education to strengthen school-enterprise cooperation. It no longer simply emphasizes the theoretical nature of professional teaching but also emphasizes the pertinence and practicality of personnel training [3].

The transformation and development of local undergraduate colleges is a kind of institutional innovation and a further deepening of applied talents. The main goal and direction of the musicology major in local undergraduate colleges are to train middle and primary school music teachers, music creators, and mass literary and artistic workers needed by society. In this way, it assumes the important responsibility of prospering and developing local
music and art culture and transporting and cultivating applied talents of music and art for the local area. The teaching of music theory courses at CAU is related to the realization of the goal of cultivating talents and the improvement of students’ comprehensive quality. It is in a very important position in college music education. It is also particularly important to integrate and rebuild music courses under the background of transformation [4].

Music course is an important part of music education and the foundation of music education. Its importance cannot be underestimated. It even plays a decisive role in the whole music teaching. Through the adjustment and optimization of music courses in colleges and universities, the problems and cruxes that restrict the cultivation of talents are found. And on this basis, the relevant laws of applied education are discussed so as to gradually establish a sound professional system of music education to achieve the goal of cultivating applied artistic talents that meet the needs of local culture [4]. The integration and reconstruction of the curriculum system have a great role in promoting the quality project of talent training for music education majors in local CAU, and can effectively improve the quality of local CAU and promote the development of the local regional economy [5]. At present, China has built the largest higher education system and has entered the stage of popularization of higher education. However, the overall education structure and talent training model are still difficult to meet the needs of economic transformation, industrial upgrading, and innovation-driven, and structural contradictions in higher education still exist, the development trend of homogenization and isomorphism is serious, and it has become a prominent factor restricting the modernization of education in China [6].

The teaching of music majors at CAU is related to the realization of the goal of cultivating talents and the improvement of students’ comprehensive quality. It is in a very important position in college music education. How to realize the optimization and reconstruction of its curriculum and teaching so as to achieve the goal of music education’s major transformation is a question worthy of further study. For a long time, with the comprehensive promotion of western culture in the world, western music culture has also spread without obstacles in the world, thus accelerating the process of disintegration of the local music culture system of postdevelopment modern countries, making the world of human music culture to a single direction of the centralization of western music culture. With the deepening of people’s understanding of the social value of local music culture, they began to realize the importance of regaining the right to disseminate local music culture [7].

Therefore, integrating and rebuilding the local music curriculum and overcoming the dependence on foreign music culture have become important content of today’s music curriculum reform. By changing the setting of music theory courses at CAU, we can further achieve the goal of cultivating applied art talents that meet the needs of regional culture, which also enriches the relevant theories of art education at CAU in China, and provides a certain reference value for the academic community. It is a major reform to realize that education creates greater value for learners, and it has great practical significance for accelerating the establishment of a modern vocational education system and accelerating the adjustment of the structure of higher education. This paper is oriented on the integration and reconstruction of music courses. The main contributions of this research study include the following.

We introduce the development status of curriculum integration and reconstruction and use neural networks to evaluate the teaching quality after integration and reconstruction. We introduce the related principles of CNN and GRNN and construct an education quality evaluation system for music courses. Finally, we iterate the methods of integration and reconstruction to achieve the best results and constructed a custom data set to test the proposed model and compare its results with expert evaluation results and the CNN-BP model.

2. Related Work

In the context of industrialization intensifying the one-sided development of human beings, the apperception process of Beane [8] is a process of combining scattered concepts into a whole, explaining and melting new concepts with existing concepts. Paying attention to the integrity of knowledge, the arrangement of teaching materials, the order of teaching, etc. has laid the foundation for the integration of subject courses and is the beginning of the concept of curriculum integration. Subsequently, Loepp [9] also proposed a curriculum integration theory, such as history, literature, and religion as the center of integration. Wall and Leckie [10] take the discipline of cultivating students’ sentiment as the center of curriculum integration. Hinde [11] proposed the geocentric integration theory and so on. In addition, James and Adams [12] pay more attention to children and practical issues, advocating that the curriculum should be organized through children’s practical activities as much as possible, and outlines a blueprint for the integration of children’s centers in the early 20th century. In the 1930s and 1940s, the progressive education movement gradually emerged, emphasizing a child-centered integrated curriculum. Its representative Dewey proposed the integration of curriculum and discipline, children’s experience and social issues, and combined curriculum and children’s experience [13]. Among them, the inquiry courses of the Chicago Laboratory School and Lincoln School are beneficial attempts to integrate children’s centers. The American Association for Progressive Education conducted an “eight-year study,” the organizational content of the core curriculum was mainly socially centered, and it was concluded that the students of the experimental school of progressive education outperformed the graduates of the traditional school [15]. Through the development of Hopkins et al., the child- and society-centered oriented curriculum integration theory gradually took shape. From the mid-to-late 1940s to the 1970s, the United States advocated a return to basic education due to the artificial Earth satellite of the former Soviet Union. The mainstream of school education and the overall trend of curriculum integration are declining. The rise of the
humanistic education trend takes the integration of emotion, cognition, and student action as the core of the curriculum. The curriculum integration that emerged at the same time was STS education based on science education to overcome the shortcomings of scientific omnipotence and supremacy [14]. Since the 1980s, the United States has launched a reform movement aimed at improving the quality of education, ushering in the era of comprehensive curriculum diversification. For example, based on the “cultural production theory,” the core knowledge courses in the basic form of sub-subject courses are advocated, and interdisciplinary teaching and theme teaching are adopted. At the same time, new theoretical trends have emerged, such as the postmodern curriculum view, which strongly advocates interdisciplinary integration and eliminates the boundaries between disciplines. They believe that the curriculum itself is integrated rather than differentiated, and should be debounded rather than closed [15]. To sum up, curriculum integration is not an emerging theory. The multioriented curriculum integration design includes the design of curriculum form, the organization and implementation of curriculum integration, and the integration of evaluation. It can be seen that curriculum integration not only seeks the integration of the three elements of knowledge, students, and society but also seeks the overall planning and design of each element of the school curriculum. In terms of the reconstruction of the music curriculum, the multicultural perspective is the foothold of the reconstruction of the Chinese folk instrumental music curriculum in normal schools. With the acceleration of the process of globalization, the cultural exchanges between different social groups are getting closer and closer, and the tension between cultural homogeneity and heterogeneity is rising to the central issue of global interaction. Therefore, the reconstruction of the music curriculum is obviously not enough to find the driving force for curriculum development only from traditional music culture. Individuals should base themselves on their own countries from a global perspective, and conduct free exchanges and exchanges between people of all ethnic groups on the premise of not losing each other. [16]. Huang [17] proposed that reestablishing the concept of folk music is the premise of the reconstruction of the music curriculum. Because China’s music education lacks awareness of the western music culture center of its curriculum theory, it leads to the loss of our national cultural awareness and the fracture of music culture tradition to some extent, which is extremely incommensurate with China’s historical tradition and future development. In order to change this situation and make music education meet the needs of building a socialist national music culture with Chinese characteristics, it is necessary to clarify and emphasize the fundamental role of traditional music in the construction and development of modern national music culture. Ding et al. [18] believe that the construction of teaching materials is the key to the reconstruction of music courses. As the main basis of teachers’ teaching, textbook not only affects the improvement of teaching quality to a large extent but also directly affects the success or failure of curriculum reform. For a long time, the use of teaching materials in Chinese music teaching has been in a loose state of no system, indeterminacy, and no requirements. Therefore, the construction of teaching materials has become the key to the reconstruction of music courses. Gao et al. [19] believe that an equal teacher-student relationship and a diverse evaluation mechanism are the core of music curriculum reconstruction. Life-oriented education in the 21st century advocates “people-oriented” and focuses on the all-around development of people. This means that the teaching of music courses should bid farewell to the traditional “command-obedience” type of teacher-student relationship and a single closed evaluation mechanism so as to reestablish a teacher-student relationship of equal dialogue and multiple evaluation mechanisms. Machine learning, deep learning, and big data analytics have been used during the last decades in education and various information technology-related areas for the effective use of data to enhance data processing and be able to extract useful insights from data. This enables us to process large amounts of data and realize information transmission with low time delay and low energy consumption [20–23] (Table 1).

3. Method

3.1. System Framework Design. It is a major reform to realize that education creates greater value for learners, and it has great practical significance for accelerating the establishment of a modern vocational education system and accelerating the adjustment of the structure of higher education. In this paper, for the integration and reconstruction of music courses, the neural network is used to evaluate the teaching quality after the integration and reconstruction, and then the method of iterative integration and reconstruction is used to achieve the optimal effect. The specific system framework is shown in Figure 1.

3.2. Convolutional Neural Networks

3.2.1. CNN Model. CNN can extract local features between input indicators, and can significantly improve the accuracy of music course teaching quality assessment. The input data of the input layer are the data processed by the sliding window technology, and the convolutional layer and the pooling layer can be set to extract multiple features.

3.2.2. Convolutional Layers. The convolutional layer is equivalent to disconnecting part of the fully connected neural network and converting it into a partially connected neural network. The parameters of the convolution kernel in the convolution layer are the weights of the locally connected neural network, and its main function is to extract and optimize the input feature values. For the PSSM matrix, the data are divided according to the sliding window. As the input of the CNN, the convolutional layer uses local
convolution and weight sharing to extract features from the input data. The definition of the convolution kernel is as follows:

\[ W^i = \{ W_{i1}, W_{i2}, W_{i3}, \ldots, W_{ik}, \ldots, W_{IN} \}. \]  

(1)

The process of convolution is to use the convolution kernel to operate with the input matrix to generate a feature map equal to the number of convolution kernels. The feature map is obtained by multiplying the input matrix by the weight and adding the offset. The feature map is defined as follows:

\[ Z_{ik}^i = f \left( \sum_h P_{ik}^{i-1} \ast W_{ik} + p \right). \]  

(2)

If the convolution module consists of 2 (1 x 1) convolution kernels, 2 (2 x 2) convolution kernels, 2 (3 x 3) convolution kernels, and 2 (4 x 4) convolution kernels. The idea of this design is as follows: the input is a 4 x 4 data matrix, the 1 x 1 convolution kernel connects each input data, and the 2 x 2 convolution kernel is equivalent to the input data matrix 2 x 2 local makes a partial connection. The same 3 x 3 convolution kernel is equivalent to partially connecting the 3 x 3 parts of the input data matrix. The 4 x 4 convolution kernel is equivalent to fully connecting the input data matrix. This is equivalent to analyzing the input data matrix from multiple perspectives and scopes, as in

\[ M = \left( \frac{W - F + 2P}{S} \right) + 1. \]  

(3)

In the optimization process, the number of convolution kernels is proportional to the network depth, which makes networks of different depths have roughly the same number of parameters. Because the convolution kernel used by the optimizer of the model is one-dimensional and two-dimensional, the effect of one-dimensional convolution is better than that of two-dimensional convolution after experiments, and it is easy to operate, so the original features are directly arranged into vector input when inputting. The input is a data column vector. After normalizing the collected eigenvalue data, they are arranged in order from top to bottom to form a 12-dimensional vector. When the one-dimensional convolution operation is converted into a

<table>
<thead>
<tr>
<th>References</th>
<th>Description</th>
<th>Area of focus</th>
<th>Findings/conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>[8]</td>
<td>Curriculum integration and the concept of knowledge</td>
<td>Education</td>
<td>Curriculum integration centers curriculum on life</td>
</tr>
<tr>
<td>[10]</td>
<td>Curriculum integration for students and teachers</td>
<td>Education</td>
<td>Integration offers a way to pose questions and investigate</td>
</tr>
<tr>
<td>[11]</td>
<td>Curriculum integration in the modern era</td>
<td>Education and social sciences</td>
<td>Social science has gained lesser attention than it needs</td>
</tr>
<tr>
<td>[12]</td>
<td>Curriculum integration in mathematics and nutrition</td>
<td>Education at elementary level</td>
<td>Integration in math and nutrition will produce healthy adults and quantitative thinkers</td>
</tr>
<tr>
<td>[13]</td>
<td>Integrating physical activity throughout the curriculum to teach children about lifestyle and physical activity</td>
<td>Physical education</td>
<td>Designed a physical activities curriculum for children</td>
</tr>
<tr>
<td>[14]</td>
<td>The need for curriculum integration in social sciences</td>
<td>Social sciences</td>
<td>Lack of integration has adverse effects and the practice should be abolished</td>
</tr>
<tr>
<td>[15]</td>
<td>Curriculum integration and students’ involvement</td>
<td>Elementary education</td>
<td>New theoretical trends advocate curriculum integration, it needs to be debounded</td>
</tr>
<tr>
<td>[16]</td>
<td>Planning curriculum integration</td>
<td>Education</td>
<td>Music is a universal language and its integration into the curriculum promotes learning</td>
</tr>
<tr>
<td>[17]</td>
<td>Integration of music education in the curriculum</td>
<td>Middle school education</td>
<td>This will effectively promote development of folk music and folk music culture</td>
</tr>
</tbody>
</table>

Table 1: Summary of related works.

Figure 1: A system framework for music curriculum integration and reconstruction.
feedforward neural network, it can clearly show that the connection of some neurons in the fully connected layer is disconnected and converted into a local connection. The value of the one-dimensional convolution kernel is the neuron weight. According to formula (3), after the convolutional layer, one 12-dimensional feature vector, one 11-dimensional feature vector, and so on, until one two-dimensional feature vector and one eigenvalue can be obtained.

3.2.3. Pooling Layer. The main function of the pooling layer is feature dimensionality reduction. The pooling method is also a hyperparameter of the CNN, mainly including maximum pooling and average pooling. The result of the pooling layer processing is that the feature dimension can be reduced, the parameters can be reduced, the calculation speed can be improved, and the overfitting can be effectively reduced. At the same time, it has translation invariance and increases robustness. By setting the pooling layer to divide the area of the feature map, the biggest difference between max pooling and average pooling is that the output of max pooling is the maximum value of the area and the average value of the output area of average pooling. The pooling module consists of a pooling core of length 12, a pooling core of length 11, and then pushed to a pooling core of length 2 in turn. Pooling adopts the max-pooling algorithm to extract the maximum value in the N-dimensional vector, and finally, 12 eigenvalues can be obtained and input to the next layer.

3.2.4. Fully Connected Layer and SoftMax Layer. Each neuron in the fully connected layer must be connected to each neuron in the previous layer, and the neurons in the fully connected layer are not connected to each other so that local features can be linked to obtain global features. The Softmax layer is the classification output layer. The output layer is composed of three neurons. The output of this layer satisfies the following formula:

$$\sum_{j=1}^{n} F_j = 1.$$  \hfill (4)

3.3. GRNN

3.3.1. GRNN Regression Fitter. The GRNN regression fitter is divided into four layers, namely the input layer, the model layer, the summation layer, and the prediction output layer:

1. Input layer: the input layer is 12 optimized feature values after convolution and pooling.
2. Mode layer: the number of neurons in the model layer is automatically generated, and its number is $n$, where $n$ represents the number of input samples. Each neuron corresponds to a training sample, and the model layer neuron transfer function is as follows:

$$D_i = \exp\left(-\frac{(X - X_i)^T (X - X_i)}{2\sigma^2}\right); i = 1, 2, ..., n,$$  \hfill (5)

where the value calculated by $D_i$ is the output value of the neurons in the pattern layer; the value is the exponential square of the Euclidean distance between the input variable $X_i$ and its corresponding sample $X_i$; and its expression is as follows:

$$L_i = (X - X_i)^T (X - X_i).$$  \hfill (6)

If the training sample is too large, the number of neurons in the pattern layer will also become too large, and the amount of calculation will also become too large, so GRNN is not suitable for large sample training and fitting.

3. Summation layer: summation of neurons in the summation layer; the calculation formula is as follows:

$$\sum_{i=1}^{n} Y_i \exp\left(-\frac{(X - X_i)^T (X - X_i)}{2\sigma^2}\right).$$  \hfill (7)

The $i$th neuron in the pattern layer is summed with the $j$th molecule in the summation layer, the connection weight between neurons is the $j$th element in the $i$th output sample $Y_i$, and the transfer function is as follows:

$$S_{Nj} = \sum_{i=1}^{n} Y_i P_i; j = 1, 2, \ldots, n.$$  \hfill (8)

4. Output layer: the calculation formula of the output neuron is as follows:

$$y_i = \frac{S_{Nj}}{S_k}; j = 1, 2, \ldots, n.$$  \hfill (9)

3.3.2. The Overall Operation Process of Forward Propagation. The first step is to directly input the 12-dimensional column raw feature vector. In the second step, after a convolutional layer with 12 one-dimensional convolution kernels, all possible combinations are designed as one-dimensional convolution kernels. A 12-dimensional feature vector is obtained which is analogous, and the last one is obtained by 12-dimensional and one-dimensional convolution to obtain a feature value. 11 eigenvalues are obtained, plus one eigenvalue obtained after convolution, a total of 12 optimized eigenvalues are obtained. The fourth step is to input the 12 eigenvalues into the GRNN, which includes a pattern layer and a summation layer, and finally outputs the prediction result.

3.3.3. CNN Feature Optimizer Training Method. First, the convolution kernel weights and bias values are randomly initialized, the error between the output value and the actual value is obtained through forward propagation and output,
and then the convolution kernel weights and bias values are updated through error back propagation. Finally, the error convergence is achieved, and if it no longer converges, the training ends.

3.3.4. Training of the GRNN Regression Fitter. GRNN training does not use the error back-propagation algorithm. It generates as many neurons as the training number in the pattern layer. In this example, multiple neurons are generated to correspond to each training sample one to one. The predicted value is calculated directly from the input value and the training samples. GRNN only needs to determine the $\sigma$ parameter. This hyperparameter is not trained but manually set.

3.4. Music Course Evaluation Index System. The teaching evaluation index system of music courses is not only a standard but also a method system. Therefore, the selection of evaluation indicators must be operable. Determining the evaluation goals of vocal music teaching is an important premise for setting up the evaluation tasks of vocal music teaching, and it is also the premise for further implementing the performance evaluation. Therefore, before performing performance evaluation in vocal music courses, teachers must first determine the subject they want to evaluate and which abilities and qualities they want to evaluate students.

According to the talent training goals of music majors in ordinary CAU, we need to formulate evaluation goals for vocal music courses under the guidance of the spirit of the outline. We need to master the correct singing method, have the ability to guide students to sing, and master the basic theory and basic knowledge of vocal music. We need to improve our artistic aesthetic ability and musical and artistic accomplishment, fully understand the performance content, historical background, and singing style of singing works, and be able to independently analyze and artistically process songs. We need to be able to understand the relationship between singing and language and use standard pronunciation or other national languages to sing songs. Mastering the basic methods of vocal music teaching and being familiar with the relevant health care knowledge of adolescents’ voice changing period can well guide adolescents to deal with the situation.

The realization of a goal is a systematic project, and vocal music teachers need to formulate different teaching implementation plans for them according to the teaching goals and the individual situation of the students. Taking the cultivation of musical talents as the starting point, we should pay attention to the basics of vocal music courses, focus on the cultivation of basic abilities, provide enough practical opportunities, and cultivate one’s own artistic accomplishments. The goals of vocal music teaching evaluation can be divided into four levels. Based on the particularity of the vocal music curriculum, it is very important to follow the principle of gradual progress when setting the evaluation objectives of the vocal music curriculum, which is consistent with the teaching rules of vocal music. Based on the above characteristics, this paper sets up the evaluation index system in Table 2.

<table>
<thead>
<tr>
<th>Table 2: Music course evaluation index system.</th>
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<tbody>
<tr>
<td>Index</td>
</tr>
<tr>
<td>Ability to instruct students to sing</td>
</tr>
<tr>
<td>Master the basic theory and basic knowledge of vocal music</td>
</tr>
<tr>
<td>Possess certain singing skills</td>
</tr>
<tr>
<td>Good artistic aesthetic ability and musical art accomplishment</td>
</tr>
<tr>
<td>Fully understand the content, context, and style of the work</td>
</tr>
<tr>
<td>Ability to independently analyze and artistically process songs</td>
</tr>
<tr>
<td>Master the basic methods of vocal music teaching</td>
</tr>
<tr>
<td>Typhoon performance is natural and generous</td>
</tr>
<tr>
<td>Ability to use vocal skills freely in singing</td>
</tr>
<tr>
<td>Completely correctly grasp the rhythm and pitch of the song</td>
</tr>
<tr>
<td>Use clear, regular voice intonation in singing</td>
</tr>
<tr>
<td>Able to grasp the emotions expressed in the works well</td>
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</table>

4. Experiments and Discussion

4.1. Data Set and Model Parameter Settings. In order to evaluate the teaching quality of music courses, this paper designs a suitable data set according to the evaluation index system, including 780 sets of data, of which 720 sets are used for model training and 60 sets of data are used for testing. Considering the inconsistency of the dimension and value of the input data, the data must be normalized. The normalization process is to convert the input of the value to $[0, 1]$, which is realized by the following formula:

$$S'_i = \frac{S_i - S_{\text{min}}}{S_{\text{max}} - S_{\text{min}}}$$  (10)

4.1.1. The Impact of One- and Two-Dimensional Convolution on the Model. As shown in Figure 2, when evaluating the teaching quality of music courses, the MSE value of the CNN-GRNN model using one-dimensional convolution is lower than that of the CNN-GRNN model using two-dimensional convolution, that is, the one-dimensional CNN-GRNN model is lower than the two-dimensional convolution CNN-GRNN model. One-dimensional CNN-GRNN is chosen because of its high accuracy.

4.1.2. The Impact of Convolutional Layer Design on the Model. The main role of the convolutional layer is to extract and optimize the input feature values. This section discusses the influence of different convolution kernels and the number of convolution kernels in the convolutional layer on the prediction accuracy of the model. In order to find a suitable convolution layer design, according to the local connection from small to large, first set 12 convolution kernels from 1 to 12, and then start from the first convolution kernel and increase each time until 20 convolution kernels. In this section, 9 schemes are designed, with the
number of convolution kernels being 12, 13, 14, 15, 16, 17, 18, 19, and 20. The results are shown in Figure 3.

As shown in Figure 3, through the evaluation of the teaching quality of music courses, it is found that the optimal solution is when the number of convolution kernels is 12, and the MSE of the convolution kernel is no longer significantly reduced.

4.1.3. The Impact of Activation Function on the Model.

The main role of the activation function is to convert a linear representation into a nonlinear representation. This section mainly analyzes the influence of the four activation functions on the prediction accuracy of the model, and the selected functions are shown in Table 3. The experimental results are shown in Figure 4.

Figure 4 shows that when the ReLU activation function is used, the MSE between the assessed music course teaching quality value and the true value is the smallest.

4.1.4. The Impact of σ Parameter on the Model.

The σ parameter determines whether the fit of the GRNN network is accurate. The parameters of this experiment are determined between 0.2 and 0.02, and the experiment is performed every 0.02 and the MSE is output. The experimental results are shown in Figure 5.

As shown in Figure 5, when the σ parameter is 0.06, the mean square error reaches the lowest point of 0.015, and it can be concluded that the optimal value of the σ parameter is 0.06.

4.2. CNN-GRNN Model Test Situation.

In order to highlight the superior performance of the CNN-GRNN model proposed in this paper, the CNN-BP model is selected for comparison experiments. The evaluation results of the two models are compared with the results of the expert evaluation. The comparison of the indicators of the two models is shown in Figure 6.

From the experimental results in Table 4, the output of the CNN-GRNN model is closer to the expert evaluation results, and the error is smaller.

From Figure 6, when evaluating the teaching quality of music courses, the error indicators of the CNN-GRNN model are lower than those of the CNN-BP model. It can be concluded that the evaluation accuracy of the CNN-GRNN model is slightly higher than that of the CNN-BP model.
5. Conclusion

Integration and reconstruction represent a trend in music education curriculum construction. Integration means emphasizing the overall coordination of the system and giving full play to the comprehensive advantages. It refers to organizing and synthesizing the relevant teaching content in each course or each teaching link of the original system through a new combination method so that the relevant courses can form the content. The new curriculum links with less redundancy, good structure, and overall coordination, and achieves the integration of advantages and the aggregation of highlights to give full play to its comprehensive advantages. Through the integration and reconstruction of the music education curriculum, the boundaries between disciplines can be diluted, and the interconnection between disciplines and the connection between science and social systems can be emphasized. Therefore, this paper introduces the development status of curriculum integration and reconstruction at home and abroad, and provides a theoretical basis for the subsequent construction of the corresponding index system. The related principles of CNN and GRNN are introduced, and an education quality evaluation system for music courses is constructed. We build the experimental data set, and introduce the design ideas and specific parameter settings of the CNN-GRNN model. In addition, the CNN-GRNN model and the CNN-BP model are compared and analyzed in terms of the quality assessment accuracy of music courses, and MSE is used as the measurement index. The results show the effectiveness of the proposed approach.

Though our work is limited only to the reconstruction of music curriculum integration, these approaches could be used to design adaptive reconstruction methods for curriculum integration in any discipline. Moreover, the use of large-scale data sets and big data analytics tools would greatly enhance the effectiveness of the proposed approach.

Data Availability

The data sets used during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

References